

**WP8 : Alcohol**  
**Report on data collection for alcohol consumption**  
**and related relative risks**

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## Abstract

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This DYNAMO-HIA report relates to workpackage 8, “WP8 – Alcohol”. It summarises the methods used to obtain age- and gender-specific data on alcohol consumption in the 27 EU countries, as well as age- and sex-specific relative risks for the health outcomes selected for the project. It also provides the final estimates that will be used in the DYNAMO-HIA model.

## List of abbreviations

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The following abbreviations are used in this report:

COPD	Chronic obstructive pulmonary disease	INSEE	Institut National de la Statistique et des Etudes Economiques (France)
DYNAMO-HIA	a Dynamic Model for Health Impact Assessment project	KTL	National Public Health Institute of Finland
EU	European Union	RKI	Robert Koch Institute (Germany)
EC	European Commission	RR	Relative risks
HIS	Health Interview Survey	UNECE	United Nations Economic Commission for Europe
IAS	Institute of Alcohol Study	WP	Workpackage
IHD	Ischaemic heart disease		

## Acknowledgements

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- First, it used data from the SHARE project (SHARE release 2.2.0, as of August 19th 2009). SHARE data collection in 2004-2007 was primarily funded by the European Commission through its 5th and 6th framework programmes (project numbers QLK6-CT-2001- 00360; RII-CT- 2006-062193; CIT5-CT-2005-028857). Additional funding by the US National Institute on Aging (grant numbers U01 AG09740-13S2; P01 AG005842; P01 AG08291; P30 AG12815; Y1-AG-4553-01; OGHA 04-064; R21 AG025169) as well as by various national sources is gratefully acknowledged (see <http://www.share-project.org> for a full list of funding institutions).
- Second, data from the General Household Survey (GHS) 2006 were re-analysed to obtain the information required by DYNAMO-HIA. The GHS 2006 was conducted by Office for National Statistics – Social and Vital Statistics Division, and sponsored by the Office for National Statistics, the Department of Health, Communities and Local Government, the Department for Work and Pensions, and the Scottish Government. Data are supplied by the UK Data Archive. The data are Crown copyright.
- Third, information from the Spanish National Health Survey (SNHS) 2006 (Encuesta Nacional de Salud 2006) were analysed to obtain estimates of alcohol consumption. The SNHS 2006 was conducted by the Spanish Ministry of Health and Consumption and the

National Statistics Institute (INE). Data files were obtained from the 2006 Spanish National Health Interview from the website of the INE (<http://www.ine.es/jaxi/menu.do?L=0&type=pcaxis&path=%2Ft15/p419&file=inebase>) with the help of Dr Esteve Fernández (Department of Clinical Sciences, School of Medicine, Campus of Bellvitge, Universitat de Barcelona).

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This report was prepared by Joceline Pomerleau, Kate Charlesworth and Martin McKee. It reflects only its authors' views; the European Commission and all those who provided information are therefore not liable for any use that may be made of the information contained therein.

## Introduction

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DYNAMO-HIA (DYNAmic MOdel for Health Impact Assessment) project (<http://www.dynamo-hia.eu/root/o14.html>) is an EU funded project aiming to develop a web-based tool to assess the health impact of policies in the European Union (EU) through their influence on health determinants, including alcohol consumption. This document provides information on the project's 8<sup>th</sup> workpackage: "WP8 – Alcohol". It describes the sources of data that were used to deliver the required age- and gender-specific data on consumption of alcohol as well as estimates of age- and sex-specific relative risks for selected health outcomes which have been related to alcohol intake.

WP8 was led by the London School for Hygiene and Tropical Medicine but it also involved all associated partners and all 25 collaborating partners. The three main objectives of WP8 were:

1. To contribute to the discussion on specification of the model and specification of scenarios in WP4 ("Model specification and scenarios);
2. To deliver: (a) age- and gender-specific data on consumption of alcohol in as many EU countries as possible, using existing publicly available data sources; and (b) age- and sex-specific relative risks (RRs) of disease incidence associated with alcohol consumption;

This information provides input for the DYNAMO-HIA model and so links WP8 to the diseases investigated in WP9 (Cardiovascular disease and diabetes) and WP10 (Cancer);

3. To write a paper on an application of the model (this will contribute to WP2 – "Dissemination of the results").

The two main outputs of this WP are a set of data on levels of consumption of alcohol in Europe, and its associated relative risks (RR), and a paper on an application of the DYNAMO-HIA model to alcohol consumption. This report discusses specifically the first output of the WP, including the data collection methods used to gather information on alcohol consumption and relative risks.

## Part 1 Estimating data on alcohol consumption

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### 1. Choice of exposure variable

Categorisation of alcohol consumption is complicated. Unlike cigarettes, which individuals typically smoke a relatively constant number each day, alcohol consumption varies in both frequency and amount. Furthermore, again unlike cigarettes, which come in clearly identifiable units, the amount of alcohol consumed is subject to misclassification, with individuals typically underestimating how much they consume, especially if they pour their own drinks. Although more recent research has taken these considerations into account, especially through the use of quantity-frequency measures in population-based surveys of the pattern of consumption, there is still a paucity of data on the health risks associated with different patterns of consumption. For this reason a pragmatic decision was made to classify alcohol consumption in terms of grams of pure alcohol consumed per person and per day.

Alcohol intake was categorised into five groups as described in Table 1. These correspond to the categories used for the presentation of relative risks (see Part 2), which were mainly taken

from a paper by Rehm et al.<sup>1</sup>. They are slightly different from those used in the WHO Global Burden of Disease Study for the year 2000<sup>2</sup> in that they are the same for males and females and there are five rather than four drinking categories.

**Table 1. Alcohol consumption categories used in the DYNAMO-HIA project.**

Alcohol consumption category	Males	Females
Category 1 (reference group)	0 - <0.25 g/d	0 - <0.25 g/d
Category 2	0.25 - <20g/d	0.25 - <20g/d
Category 3	20 - <40g/d	20 - <40g/d
Category 4	40- <60g/d	40- <60g/d
Category 5	≥60g/d	≥60g/d

The following section describes the methods used to obtain estimates of alcohol consumption.

## 2. General approach for obtaining data on alcohol consumption

The two main sources of data on the alcohol consumption of a population (in grams of pure alcohol per day) are from data on supply of alcohol (expressed in terms of the population in the market being served) and from population-based surveys of consumption.

### Supply data

The most commonly available and widely used estimates of alcohol consumption at the population level are per capita statistics on the availability of alcohol (e.g. in litres of beer, wine, spirits or pure alcohol per person per year)<sup>3</sup>. These are usually obtained from alcohol sales or taxation data, and import and export data, with the resulting alcohol volume then divided by the mid-year population<sup>4</sup>. The merits of per capita estimates of alcohol supply are that they provide readily available data for a majority of countries, and they avoid the subjectivity of self-reports associated with individual survey data. However, they are dependent on the accuracy of the data sources (e.g. accurate import/export data) and it should be noted that they exclude duty-free alcohol, overseas consumption, homemade and illicit commercial alcohol, smuggling and consumption by tourists. Furthermore, per capita estimates are averages across the entire adult population, ignoring differences within the population between males and females and different age groups.

### Individual level estimates from population-based surveys

Data collected at the individual level using population-based surveys can provide valuable information on the mean intakes or the distribution of various levels of intake according to different socio-demographic characteristics.<sup>5</sup> This was a key consideration when collecting data for the DYNAMO-HIA project, which required age- and gender-stratified estimates of alcohol consumption (see section 2.1). However, there is a lack of internationally comparable data on alcohol consumption at the individual level, this being in part due to the difficulties associated with estimating intakes of individuals (e.g. potential measurement error and bias)<sup>6</sup>, but chiefly potential under-reporting of intakes.

In this project, both survey and per capita alcohol consumption estimates were collected and considered for developing the final exposure estimates:

1. Survey data were the key source of information as only surveys with data collected at the individual level can provide information on the distribution of alcohol consumption in

population sub-groups. Thus we set out to identify data from at least one valid and nationally representative population-based survey with information on alcohol consumption for each of the 27 EU countries; the aim was to obtain age- and gender-specific data on alcohol intake, including estimates of the prevalence of abstainers, and on the distribution of alcohol consumption according to our specific drinking categories.

2. Published estimates of national adult per capita consumption of pure ethanol were gathered for each of the 27 EU countries (see further details in Section 3.2).

Our initial intention was to combine both sources of information using an iterative process derived from the methods used in the World Health Organization Comparative Risk Assessment (CRA) Study<sup>2,7</sup>, based on the assumption that adult per capita supply data provide the best overall estimate of alcohol intake for a country and that survey information can provide estimates of the distribution of intake by gender and age groups. However, in doing so we identified previously unreported problems with this method. Further details of the approaches used and their feasibility are provided in Section 4.

### **3. Data collection and estimation methods**

#### **3.1 Data collection and estimation methods for individual level data**

##### *3.1.1 Criteria for selecting sources of individual level data*

The main criteria used for including sources of individual level data on alcohol consumption from surveys were as follows:

##### Time frame

- The study was relatively recent: we gave preference to surveys conducted on or since 2000.

##### Study sample

- The reference population was described and corresponded as closely as possible to the national population (thus regional surveys and those of special interest or of particular groups (e.g. people with diabetes) were excluded).
- The sampling strategy was as close as possible to random sampling.
- The sample was representative of the reference population.
- The sample size was large (the sample size calculation was ideally included).
- As wide an age range as possible (from 15 years onwards) was included.
- Data were available by age and gender.
- The level of non-response was documented.

##### Study design

- Only population-based cross-sectional studies, baseline assessment of large cohort studies (sample representative of the general population), or large interventions (sample representative of the general population) were considered for inclusion.
- Case-control studies were excluded from the selection process.

##### Validity of the methods

- The methods used to collect data were as free of bias as possible.
- Data were collected at the level of the individual.

- The statistical analysis of the data was appropriate.

#### Type of information

- Data on alcohol consumption had to be available according to the set categories defined under Section 1 above, stratifying by gender and age group.
- The favoured method of data collection on alcohol information was based on usual frequencies and quantities consumed over a period of at least one month as recalls of alcohol consumption over the last seven days (or shorter period) tend to overestimate the proportion of individuals consuming no or small amounts of alcohol. However, it was decided that a combination of questions could also be used, i.e. that questions on alcohol consumption over the last seven days could be combined with an estimate of the proportion of abstainers based on the percentage of respondents who have drunk no alcohol for a long period of time (e.g. during the last year).

The following hierarchy of data quality was used to select one source of data for a given country where more than one data source was available:

- National survey of individual alcohol consumption;
- Large sample survey of good quality—its quality being assessed from how well the survey met the list of criteria for including sources of individual level data (see above); and
- Small sample survey of good quality—its quality being assessed as above.

#### ***3.1.2 Search strategy for the identification of individual level data***

Alcohol consumption data were identified using a comprehensive search which included computerised databases of published articles, hand-searching of bibliographies, internet search of possible sources of data, and contact with experts in the field.

##### ***Computerised databases, library and internet searches***

The PubMed database (<http://www.ncbi.nlm.nih.gov/sites/entrez>) was searched using the free search terms “alcohol consumption [country name]”, or “alcohol data [country name]” in order to identify relevant surveys and researchers who could be contacted to obtain data or further information about the studies described.

Internet searches (using the Google search engine - <http://www.google.com> and Google Scholar - <http://scholar.google.com/>) had two objectives: first to identify surveys that examined alcohol consumption in the EU, and second to identify experts that could help us obtain data from such surveys. References used in the WHO Global Status Report on Alcohol 2004<sup>8</sup> were examined.

The European Health Interview & Health Examination Surveys Database (<https://hishes.iph.fgov.be/index.php?hishes=home>) developed within the framework of the European Health Survey Information Database (EUHSID) project<sup>9</sup> was also searched by country and type of questions. However, the database sometimes lacked information on survey methodology (e.g. sample size, response rate, etc) and the contact details provided were sometimes obsolete. The Alcohol Control Database<sup>10</sup> (<http://data.euro.who.int/alcohol/?TabID=2420>) was also consulted. It provides data to track and assess alcohol policies and their implementation within and across countries of the European region; however, it does not provide alcohol consumption data.

Two key reports were used to identify various national surveys that examined alcohol intake: (1) the report ‘Alcohol in Europe: a Public Health perspective’, published in 2006<sup>11</sup> - this public health report on alcohol was requested and financed by the European Commission; and (2) the ‘WHO Global Status Report on Alcohol 2004’<sup>12</sup> which presents a variety of data on alcohol for each European country.

### ***Contacts with experts***

Direct contacts were made with experts for references to published or unpublished data sources, or for the identification of appropriate contact persons. Experts were defined as contact persons for large population-based studies that examined alcohol consumption, or contact persons in governmental agencies or academic institutions. However, the contact details of some authors were sometimes obsolete, and further searches that were conducted were sometimes unsuccessful.

Contacts were also made with other EU funded projects which also examined alcohol consumption in the EU, i.e. EUROCADET (<http://www.eurocadet.org/index.php>) and Eurothine (<http://survey.erasmusmc.nl/eurothine/>).

### ***3.1.3 Characteristics of included and excluded individual-level data***

Details of all sources of information on alcohol consumption considered for DYNAMO-HIA are provided in Annex 1. For each EU country, the general characteristics of the studies that were selected are listed, and brief information on the studies that were not selected is provided, including the key reason/s for exclusion.

#### ***Included data***

Individual-level estimates of alcohol consumption were obtained for 16 EU countries. Details of the data used for each country are described in Table 2. All were from national surveys except for Greece; in this case, data were from the baseline evaluations conducted during the Greek EPIC cohort study. All studies covered the period 2002 to 2008 with the exception of the Greek EPIC data which were collected between 1994 and 1999. Most studies used information from either a quantity/frequency approach or a 7-day recall of intake. All surveys attempted to provide nationally representative samples; most used multistage random sampling techniques.

#### ***Excluded data***

For each country, several sources of information were excluded from the selection process (see Annex 1). The reasons for the exclusion of the studies can be summarised as follows:

- Another source of data was used for the country (e.g. more representative sample, better method of data collection, more recent, larger sample size, higher response rate, etc);
- Alcohol consumption in the selected categories of intake could not be derived from the survey (e.g. insufficient number of questions, no question on quantities consumed, etc), or could not be obtained (e.g. unable to contact those who conducted the survey, or they could not provide the information in the format required, etc);
- Data were not representative of the population of the country (e.g. only sub-groups or sub-regions of the population were studied);
- Data were not sufficiently recent. All studies used were since year 2002; the only exception is that in Greece, the EPIC baseline data were collected 1994-1999.

**Table 2. Details of the studies used to estimate alcohol intake in the DYNAMO-HIA project.**

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Austria	No survey data met the inclusion criteria.							
Belgium	No survey data met the inclusion criteria.							
Bulgaria	No survey data met the inclusion criteria.							
Czech Rep	Personal communication, Jiri Holub & Sarka Dankova, 2009 (Institute of Health Information and Statistics of the Czech Republic)	Sample Survey of Health Status of the Czech Population (HIS), 2002 (71%)	Multistage national probability sampling	Face-to-face interview	Quantity-frequency questions on alcohol consumption over the past 4 weeks	N= 2,460	MF	15+years
Denmark	Personal communication, Ola Ekholm, 2009 (National Institute of Public Health)	Danish National Health Interview Survey, 2005 (67%)	Multistage random sample stratified by region (some participants had participated in the 2000 Survey)	Face-to-face interview and self-completed questionnaire	Quantity-frequency questions based on usual consumption	N=14,468 (14,566)	MF	16+ years
Estonia	Personal communication, Ardo Matsi, 2009 (National Institute for Health Development)	Estonian Health Interview Survey, 2006 (60%)	Stratified systematic sampling of permanent residents taken from the national population registry – with oversampling of the elderly	Face-to-face interview	Sum of quantity by frequency of consumption for each of beer, wine, 'light alcohol' and vodka over previous 4 weeks	N= 6,419 (6,434)	MF	15-84 years

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Finland	Personal communication, Petri Huhtanen, 2009 (National Public Health Institute)	Finnish Drinking Habits Survey, 2008 (74%)	Simple random sample of the non-institutionalised Finnish popn from popn census records, excluding the Åland Island	Face-to-face interviews	12-month beverage-specific quantity-frequency questions	N=2,725 (2,725)	MF	15-69 years
France	Personal communication, Katia Castetbon 2009 (Conservatoire national des Arts et Métiers)	Enquête Nationale Nutrition Santé (National Health and Nutrition Survey), 2006-2007 (60%)	Multistage stratified random sampling	3 randomly selected 24-hour dietary recalls (one during a weekend day) and interviewer-administered questionnaire	Combination data from the 24-hour recalls and frequency of alcohol intake during the previous 7days. Step 1: identification of abstainers from recalls/questionnaire; Step 2: among consumers: intake based primarily on the dietary recalls, otherwise based on questionnaire data	N=2,640 (3,115)	MF	20-74 years (3-74 years)
Germany	Personal communication, Alex Pabst, 2009 (IFT Institut für Therapieforschung, Munich)	German Epidemiological Survey of Substance abuse (ESA), 2006 (45%)	Two-stage probability sampling design, stratified by region with oversampling of younger individuals	Self-administered questionnaire and interviews	Specific quantity-frequency measures based on intake during the last 30 days	N= 7,571 (7,912)	MF	18-64 years

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Greece	Personal communication, Antonia Trichopoulou and Benetou Vassiliki, 2009 (WHO Collab. Centre for Nutr. and Hellenic Health Foundation, Athens)	Greek EPIC (European Prospective Investigation into Cancer & Nutrition) Cohort, 1994-1999	Volunteers actively recruited from the general population	Face-to-face interviews	Food frequency questionnaire including questions on eight different beverage types	N=28,034	MF	20-86 years
Hungary	No survey data met the inclusion criteria.							
Ireland	Personal communication, Karen Morgan, (Department of Health and Children) and Royal College of Surgeons in Ireland on behalf of the SLÁN 2007 Consortium, 2009	Survey of Lifestyles, Attitudes and Nutrition in Ireland (SLAN), 2007 (62%)	Multi-stage probability (representative) sample of the general population living in private households, selected using the GeoDirectory (compared with 2006 Census figures)	Face-to-face interviews	Based on general frequency of alcohol consumption, and number of standard drinks consumed during the previous 7 days	N=7,964 (10,364)	MF	18+ years

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Italy	Personal communication, Silvia Ghirini & Emanuele Scafato, 2009 (National Health Institute)	Everyday Life in 2007: Multipurpose Survey on Households (82%)	Double level sample design: Primary units (probability proportional to demographic size); secondary units (equal probability strategy).	Self-completed questionnaire (alcohol questions) and face-to-face interviews	Based on recall of usual consumption of different types of alcoholic beverages	N=41,491 aged 15+y (48,253 individuals of all ages, 19,170 families)	MF	11+ years (all ages)
Latvia	Personal communication, Biruta Velika & Iveta Pudule, 2009 (Centre of Health Economics)	Health Behaviour among Latvian Adult Population, 2008 surveys (52-80%)	Simple random sampling from the national population register	Self-administered questionnaire (mailed)	Based on the recall of consumption over past 7-days	N= 10,265 (11,664)	MF	15-64 years
Lithuania	No survey data met the inclusion criteria.							
Luxembourg	No survey data met the inclusion criteria.							
Malta	Personal communication, Dorothy Gauci, 2009 (Dept. of Health Information & Research)	European Health Interview survey (Malta), 2008 (72%)	Stratified random sampling from the national population register	Self-completed questionnaire (alcohol questions) and face-to-face interviews	Based on the overall frequency of consumption during the past 12 months and the recall of alcohol consumption each day of a typical week	N=2462 (3,680)	MF	15+ years

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Netherlands	Personal communication, Frans Frenken & Jan-Willem Bruggink, 2009 (Statistics Netherlands)	Permanent Survey on Living Conditions (POLS) - Health Interview Survey, 2005/2006/2007 (64-66%)	Stratified random sampling from the national population register (individuals living at home)	Self-completed questionnaire (alcohol questions) and face-to-face interviews	Quantity-frequency questions based on both previous six months consumption and usual consumption on weekdays (Monday-Thursday) and weekend days (Friday-Sunday)	N=17,930 aged 15+ years (28,822 of all ages)	MF	15+ years (all ages)
Poland	Personal communication, Wojciech Drygas and Jacek Koziarek, 2009 (National Institute of Cardiology)	National Multicenter Health Survey (WOBASZ), 2005 (74% in men, 79% in women)	Stratified random sampling (representative sample of Polish inhabitants)	Face-to-face interviews in out-patient clinics	Based the on recall of usual consumption of different types of beverages	N=13,256 (13,545)	MF	20-74 years
Portugal	No survey data met the inclusion criteria.							
Romania	No survey data met the inclusion criteria.							
Slovakia	No survey data met the inclusion criteria.							
Slovenia	No survey data met the inclusion criteria.							
Spain	Personal communication, Esteve Fernandez, 2009 (Catalan Institute of Oncology)	Spanish National Health Survey (SNHS), 2006 (96%)	Stratified multistage sampling of households (with replacement)	Personal interview (mostly face-to-face, by telephone if necessary)	Quantity-frequency questions asking about usual consumption for different types of alcoholic beverages	N=28,628 (29,478)	MF	16+ years

Country	Data sources	Name of survey, Year (response rate)	Sampling method	Data collection method for alcohol	Method used to derive daily intakes of pure alcohol	Number of respondents with information on alcohol (Overall survey size, when available)	Sex	Age range for data on alcohol (overall range for the study if different)
Sweden	Rehm et al. 2007 <sup>7,13</sup>	The (Alcohol) Monitoring Study, 2002 (~60-65%)	Random sampling of national register of households	Computer-assisted telephone interviews	Quantity-frequency questions asking about consumption during the past 30 days	N=~18,000	MF	16-80 years
UK (Great Britain)	Office for National Statistics (UK)	UK General Household Survey, 2006 (76%)	Probability, stratified, two-stage sampling of private households in Great Britain. Used a longitudinal component as approximately $\frac{3}{4}$ of the 2005 sample were re-interviewed in 2006	Face-to-face interviews; and self-completed questionnaire (for respondents aged 16-17 years). Use of proxies was sometimes permitted but not for questions on alcohol.	Beverage-specific volume and frequency questions based on usual alcohol consumption over the previous 12 months.	N=13,503 aged 16+ years (9,731 households and 22,924 individuals of all ages)	MF	16+ years (all ages)

### ***3.1.4 Estimation of individual-consumption from survey data***

Except for Spain and the UK, data from individual-based surveys were re-analysed for us by researchers involved in data collection and/or analysis (see list of personal communications in Table 2 above), so as to provide us with alcohol consumption estimates in the required DYNAMO-HIA alcohol consumption categories by gender and age group. Spanish and British data were analysed by us, using the original survey databases.

In each country, the most appropriate survey questions were selected from the questionnaires. These were generally quantity-frequency questions (see Table 2) which permitted the calculation of the total amount or volume of alcohol consumed by each respondent. Recall periods longer than 7 days were preferred as short reference periods tend to overestimate the number of abstainers and low consumers. When this was not possible, information from the 7-day alcohol consumption recall were combined with other survey questions, if available, in an attempt to obtain a better estimate of the proportion of abstainers/very low consumers (DYNAMO-HIA drinking Category 1 – see Table 1) (e.g. general consumption frequency questions such as “Have you consumed any alcohol in the past 12 months?”, were used to estimate the proportion of abstainers).

In most countries, separate quantity-frequency questions were asked for different beverage types, for example beer, wine, spirits, and alco-pops. In these cases, the total consumption of each type of beverage was calculated either in a number of standard drinking units or in millilitres. A conversion factor different for each beverage type was then applied to calculate the amount of pure alcohol consumed in grams per day. In most cases, the conversion factors applied were those used by the survey authors, and so were based on national guidelines. This was deemed the most appropriate method as ‘standard’ volumes or amounts for the different beverage types vary considerably between countries. However, for countries in which national conversion guidelines did not exist, it was assumed that a “standard drink” contains 12 grams of pure alcohol.

Finally, survey respondents were re-distributed according to the DYNAMO-HIA alcohol consumption categories to obtain prevalence estimates by gender and age-group.

## **3.2 Data collection and estimation methods for per capita alcohol consumption**

Estimates of national per capita alcohol consumption were obtained from the June 2009 version of the WHO Health For All Database<sup>14</sup>. They represent estimates of the amounts of pure ethanol in spirits, wine, beer and other alcoholic drinks consumed during the calendar year by individuals aged 15 years and over. They are calculated from official statistics on local production, sales, import and export, taking into account stocks and home production, whenever possible. Conversion factors used to estimate the amount of pure alcohol in beer is 4.5% and in wine 14% of alcohol. Estimates selected were from the same year or the closest year as survey data.

## **3.3 Approach for estimating final age- and sex-specific exposure data**

A series of procedures were developed to obtain the final age- and sex-specific alcohol consumption estimates for each of the 27 EU countries. These are described below.

### ***3.3.1 Attempts to combine individual-level and per capita estimates of alcohol intake***

Once obtained, we investigated the possibility of combining individual-level prevalence estimates (see Table 1) with national adult per capita alcohol consumption, in an attempt to reduce the impact of potential underreporting of alcohol consumption on the DYNAMO-HIA

estimates. In such combination, the per capita values are assumed to represent the overall consumption for the country, while survey data are used to estimate the distribution of this overall volume among the different sex, age, and drinking categories<sup>2,7</sup>.

The following steps were thus followed:

- 1) For each country, information on the national distribution of the population by gender and age group were obtained from the United Nations Economic Commission for Europe (UNECE)<sup>15</sup>; this provided estimates of the percentage of adult males and females in selected age groups (15-19 years; 20-44 years; 45-64 years; 65 years and over). The year chosen for the population data corresponded to the year of the survey for the country (first preference), or to per capita alcohol data (HFA-DB data) (second preference).
- 2) Using survey findings and estimates of population distributions, the mean alcohol consumption (in g/day of pure alcohol) of each gender and age group was calculated, as well as the contribution of each age group to total alcohol intake within men and women (in g/day and as a proportion of total intake). To make these calculations possible, a few assumptions had to be made. First, it was assumed that survey results accurately reflect the proportionate consumption in each sex and age group. Second, it was assumed that the mid-point of each drinking category (see Table 1 above) is the mean for the category and that 90 g/day is the midpoint of the last drinking category (which does not have an upper limit).
- 3) For each country, HFA-DB information on adult per capita consumption – in litres per year – was gathered. The year 2003 was the most recent year with data available for all countries. We considered using a value of the average of three years of data; however, when these data were plotted, there was little year-on-year variation, and so a single year was considered satisfactory. The estimates of per capita intakes were converted to grams of pure alcohol per day, assuming 789 grams of pure alcohol per litre<sup>16</sup> and dividing by 365. The resulting figures were then used to inflate the estimates of mean alcohol consumption by gender and age group obtained in Step 2.
- 4) An iteration process was then used to obtain the final adjusted prevalence proportions in the five drinking categories by gender and age group. This process followed the steps and assumptions described by Rehm et al.<sup>7</sup> – for example, that the proportion of individuals in the lowest drinking category does not change.

We carried out the iteration method for all 16 countries for which we have primary survey data. For most countries, we obtained seemingly satisfactory results. However, for some countries, we obtained implausible results, for example, negative percentages of abstainers. Our detailed examination of the results revealed flaws in the method. The method maintains the proportion of Category 1 respondents (the abstainers) as a constant throughout the iterations – that is, it assumes that all abstainers tell the truth in their survey responses. However, it assumes that those in all the other categories underestimate their consumption and so re-distributes them to higher consumption categories. Therefore, for some countries, the model required sufficient redistribution from the lowest category of consumption to render this percentage negative if the sum of those in all categories was to equal 100%. In short, this technique assumes consistent and systematic bias in surveys, whereas in reality it is likely to be stochastic.

After some discussion with the project leadership team, it was agreed first that we could not justify the adjusted results but also that, given the number of unknown parameters involved (percentage of true abstainers, extent of under-estimation by individual drinkers, sales data)

we were unable to create a robust alternative. We therefore elected not to adjust for the supply data gathered and to only use the raw survey data instead.

### **3.3.2. Smoothing**

While our literature search provided us with estimates by gender and age group, the DYNAMO-HIA model requires data by one-year age interval up until 95 years of age. It was thus decided to smooth the estimates of alcohol consumption with age in order to avoid important and unrealistic gaps at the junction of the age groups. Also, because several surveys considered a limited age range (e.g. no data below 20 years of age or above 65 years), it was assumed that smoothed data would provide better estimates of alcohol intakes for those above or below the survey age range.

In order to smooth the prevalence estimates, we proceeded as follows:

- 1) Estimates for a given age group (e.g. 20-44 years) were imputed at the midpoint of the age interval. For individuals aged 65 years and over, a midpoint of 75 years was assumed;
- 2) Estimates above and below those at the midpoint of the age interval were smoothed towards the values at the next midpoint using equal increases or decreases;
- 3) If no prevalence estimates were available at the lower end of the age distribution (e.g. no data for those aged less than 18 years old), the trend used in the upper next age group was applied;
- 4) For individuals above 75 years of age, it was decided to smooth prevalence estimates using trends in alcohol intakes obtained from the SHARE (Survey of Health, Aging and Retirement in Europe) Study<sup>60</sup>. This large, cross-sectional survey of individuals aged 50 years and over has been conducted in 14 European countries. Data from the 2<sup>nd</sup> wave of data collection (2006-2007) were obtained and analysed so that respondents could be categorised according to the five DYNAMO-HIA alcohol consumption categories. Prevalence estimates were obtained by 5-year age categories and plotted by gender. Slopes for each drinking category were estimated using data from individuals aged 60 years and over; this age limit was selected to insure a sufficiently large sample size in each country (approximately 900 to 2000 individuals) and slopes that do not show major discontinuity. The estimated rate of change in prevalence (for a 1-year increase in age) for each drinking category was applied from age 75 years.

When SHARE data were not available for one of the countries, data from a neighbouring country assumed to have relatively close drinking patterns were used. This was the case for Estonia (Danish data used), Finland (Swedish data used), Ireland (Dutch data used), Latvia (Danish data used), Malta (Italian data used), and the UK (Dutch data used);

- 5) The smoothing process sometimes led to negative prevalence estimates, particularly in the elderly. Two approaches were used to solve this problem: (1) individuals aged 86 years and over were assumed to have the same drinking patterns as those aged 85 years; and (2) negative prevalence estimates were changed to zero and the difference redistributed proportionally to the other drinking categories so that the sum of the prevalence estimates across the five drinking categories was exactly 100%.

## **4. Data on alcohol consumption by country**

Final estimates of alcohol consumption by one-year age interval for 16 countries will be available in the final DYNAMO-HIA database. Table 4 (below) provides a summary

assessment of the quality of the data graded according to the five criteria listed in Table 3, with “I” being the highest score.

Caution is needed particularly when considering the low response rate in the German survey and the non-randomised sampling method used in the Greek-EPIC study.

**Table 3. Criteria used to summarise the quality of the studies used**

Criteria	Details	
Sampling method	Random sampling of national population	I
	Non-random sampling	II
Sample size	≥ 20,000 respondents	I
	≥ 2,000 but < 20,000 respondents	II
	< 2,000 respondents	III
Response rate	>70%	I
	50-70%	II
	<50%	III
Age range for data on alcohol intake	Upper age limit > 64 years	I
	Upper age limit ≤ 64 years	II
Data collection method for alcohol intake	Survey questions based on ‘usual consumption’ or based on recall > 7 days	I
	Survey questions based on recall ≤ 7 days	II

**Table 4. Summary of the quality of the studies used.**

Country	Sampling method	Sample size	Response rate	Age range for alcohol data	Data collection method
Czech Rep	I	II	I	I	I
Denmark	I	I	II	I	I
Estonia	I	II	II	I	I
Finland	I	II	I	I	I
France	I	II	II	I	II
Germany	I	II	III	II	I
Greece	II	I	N/A	I	I
Ireland	I	II	II	I	I
Italy	I	I	I	I	I
Latvia	I	I	I/II	II	II
Malta	I	II	I	I	I
Netherlands	I	II	II	I	I
Poland	I	II	I	I	I
Spain	I	I	I	I	I
Sweden	I	II	II	I	I
UK	I	II	I	I	I

## 5. Discussion of the data provided on alcohol consumption

### 5.1 Potential sources of uncertainty related to the choice of data sources used

A major source of uncertainty in the final estimates of alcohol intakes obtained for DYNAMO-HIA relates to the choice of data sources used, i.e. surveys of alcohol consumption.

#### *Surveys of alcohol consumption*

It was decided that surveys of representative population samples would be used as the primary source of information for this project since data were needed by gender and age. However, the quality and validity of individual level data rely upon the ability (and willingness) of each individual to provide accurate information on his/her alcohol consumption. There is a long-standing controversy regarding the reliability and validity of self-reported alcohol consumption with several commentators suggesting that most survey findings under-estimate alcohol intakes relative to per capita estimates.<sup>17,18</sup> However, Del Boca and Noll<sup>19</sup> and Del Boca and Darkes<sup>20</sup> conclude that, for most research purposes, self-reported drinking shows adequate levels of reliability and validity. It is also a relatively inexpensive method and is the most widely used method.

However, the validity of survey estimates obtained for DYNAMO-HIA also rely on the choice of methods used to recall and assess alcohol consumption; several issues need to be considered including the choice of the reference period, the types of questions asked to measure quantity and frequency of consumption, the use of beverage-specific versus overall consumption questions, open-ended versus precoded responses, and definitions of drinking status.

The methods used in the selected surveys varied among countries (see Table 2 above). Nevertheless, a majority of surveys based their assessment of alcohol consumption on the recall of the number and types of alcoholic drinks (usually with suggested serving volumes) consumed on each of the previous seven days. While this 'exact recall method' is thought to reduce the problems associated with memory loss, its main disadvantages are that: (1) it may not accurately represent usual consumption throughout the month or year (e.g. irregular drinkers, populations with patterns of alcohol consumption that are influenced by season or holidays, etc); and (2) it is likely to misclassify many infrequent or irregular drinkers as abstainers, thus providing an overestimation of the prevalence of abstainers or low consumers. In order to try to reduce this problem, we incorporate, wherever possible, information on abstinence rates from other questions asking about overall frequency of consumption over a longer reference period (e.g. whether the respondent had drunk any alcohol over the past month / 3 months / 6 months / or one year).

Some of the surveys selected based their estimates on longer reference periods (e.g. several weeks, months or one year) using a combination of quantity-frequency questions. A longer reference period is thought to help 'smooth out' occurrences of atypical drinking or fluctuating habits of consumption. However, the benefits of a longer reference periods must be weighed against the effect of potential recall bias. For example, a study found that respondents appeared to have difficulty in accurately reporting alcohol intake with recall periods of just one week.<sup>21</sup> However, another study concluded that a survey question asking about intake each day in a 'typical week' was appropriate for use in epidemiological studies.<sup>22</sup>

There is general agreement that beverage-specific questions result in higher reported alcohol intake compared with data from a single series of questions on overall consumption.<sup>6,23</sup> This beverage-specific approach is the approach used by most of the surveys that we selected.

#### *Conversion to grams/pure alcohol*

Determining the most appropriate conversion of ‘standard drinks’ or ‘units’ into grams of pure alcohol was problematic given the diversity of countries involved. Many European countries have somewhat different definitions of what a ‘standard’ alcoholic drink constitutes. The challenge, then, was to ensure as consistent an approach as possible whilst taking into account inter-country variation and ‘local knowledge’.

We elected to set as the ‘benchmark’ the conversion of: 1 standard drink = 12 grams pure alcohol<sup>24</sup>. On discussion with our contacts in each country, most agreed that this was appropriate for their country. Thus several countries used this conversion. However, in some cases, for example Ireland, there was a strong view that their standard drink was significantly different from the European ‘standard’ and so in this case, ‘local knowledge’ was accepted and their nationally accepted conversion (1 standard drink = 10 grams pure alcohol) was used. Estonia and France also assumed 10 grams of pure alcohol in a standard drink. Other countries calculated alcohol consumption based on an assumed alcohol content of different types of alcoholic beverages.

#### *Response rates*

Another issue is the fact that the response rates of the surveys selected to provide DYNAMO-HIA estimates varied considerably among countries, ranging from 45% (German study) to 81.9% (Italy). In the Spanish survey, the response rate reached 96%; however it used the ‘replacement’ method for missing respondents, which may give rise to a spurious impression of representativeness. For practical reasons, many of the surveys selected to provide DYNAMO-HIA estimates excluded the homeless and people living in institutions, both groups likely to have atypical patterns of consumption (respectively high and low). As a result, the survey samples may not have been entirely representative of the reference populations.

## **5.2 Other potential sources of uncertainty**

Although we aimed to obtain individual-level alcohol intake data for every EU country, this was not possible. For countries for which we do not have data, we would suggest the users of the DYNAMO-HIA software to use of a ‘proxy’ country judged to be most similar in the amounts and patterns of drinking. As which country to include as a proxy is inevitably a matter of judgement, the DYNAMO team elected not to include proxy countries in this report, however we have provided our suggestions to the DYNAMO Co-ordinating team, who would be happy to provide them on application. In the event that extrapolations from other countries are made, this may be an important source of uncertainty, especially in the presence of inter-country heterogeneity.

Another potential source of uncertainty relates to the process of ‘smoothing’ and ‘extrapolation’ of the data. Indeed, while the DYNAMO-HIA model requires estimates by 1-year increase in age up to 95 years of age, data from the different studies selected in this report were obtained by age groups, and many studies had upper age-limits of, for example, 65 or 70 years, or a lower age-limit of 20 years. As described in Section 3.3.2, prevalence estimates were thus ‘smoothed’ and extrapolations were made for the lower and upper age limits when necessary. Whilst we have made use of the most informative evidence that we could find, clearly there is some uncertainty inherent in this process.

Finally, because we decided not to combine survey data with estimates of per capita alcohol consumption, our results are likely to be different from those obtained in the WHO Global Burden of Disease Study and in other studies that have used this approach.

### **5.3 Comparability**

Evidently there is considerable heterogeneity in the 16 surveys that we have used. However, in a project of this nature, this is unavoidable. In seeking nationally representative information from EU countries we are reliant upon individual countries' information sources. Thus the surveys used are inevitably from different countries, and different institutions. They vary in their scope (sample size), in the survey questions asked, in their sampling and data collection methods, and analysis format.

## Part 2 Estimating risk factor-disease relationships

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### 1. Choice of outcomes

Within this project, a limited number of health outcomes were selected to be modelled separately using the DYNAMO-HIA model. These health outcomes were selected based on two criteria: 1) best evidence of a risk factor-disease relationship for most risk factors examined in the project, i.e. alcohol consumption, smoking, and overweight/obesity; and 2) the prevalence of the disease. Effects of each risk factor through diseases not modelled separately can be included in the DYNAMO-HIA model by using relative risks (RRs) for all-cause mortality and all-cause disability.

The selected health outcomes discussed here include:

- all-cause mortality;
- ischaemic heart disease (IHD);
- stroke;
- diabetes mellitus;
- chronic obstructive pulmonary disease (COPD);
- cancer of the lung;
- cancer of the colon and rectum;
- cancer of the mouth and oropharynx; and
- breast cancer.

For alcohol consumption, the choice of outcomes was guided mainly by evidence of causality from the work conducted during the Global Burden of Disease for the year 2000<sup>2</sup>, and from reviews of the literature, including those of: the World Cancer Research Fund (WCFR) and the American Institute for Cancer Research (AICR)<sup>25</sup>; the International Agency for Research on Cancer (IARC)<sup>26</sup>; Rehm et al.<sup>1</sup>; and Corrao et al.<sup>27</sup>. Despite the existence of some evidence for other health outcomes such as liver cancer, it was decided not to include these in the current analyses. The users of the DYNAMO-HIA model could add them in future work.

### 2. General approach for obtaining data on relative risks

The final RR estimates provided in this report were based on a review of the literature. This provided evidence for the direction and size of the relationship between alcohol consumption and the selected health outcomes.

### 3. Data collection and estimation methods

#### 3.1 Criteria for selecting sources of RRs

Because of the categorical nature of the selected exposure variable (alcohol consumption), the search was guided towards studies and meta-analyses that used a similar way of categorising alcohol consumption.

#### 3.2. Search strategy

##### *Computerised databases, library and internet searches*

Searches of the PubMed database and the internet (using the Google search engine - <http://www.google.com> and Google Scholar - <http://scholar.google.com/>) were conducted to identify relevant studies, reviews of the literature and meta-analyses linking alcohol

consumption and the selected outcomes, as well as researchers who could be contacted to obtain data or further information.

#### ***Contacts with experts***

Contacts were made with experts in the field for references to published or unpublished data sources or for the identification of appropriate contact persons. Experts were defined as contact authors for large epidemiological studies that examined the association between alcohol consumption and the selected outcomes, or authors of meta-analyses in the same field of research.

### **3.3 Characteristics of excluded studies of relative risks**

Studies or meta-analyses were excluded if any one of the following criteria was satisfied:

- The measurement of exposure differed from that used for this project;
- The outcome measure was prognosis, pre-cancerous lesions or pre-disease markers rather than incident cases or mortality; or
- The statistical analyses of the study were not adjusted for major confounding factors such as age, sex and smoking.

### **3.4 Characteristics of included studies of relative risks**

#### ***All-cause mortality***

RR estimates for all-cause mortality were derived from White et al.<sup>28</sup>, using a Microsoft Excel spreadsheet developed by the authors to allow for further estimates to be derived (personal communication: Dan Altmann, London School of Hygiene and Tropical Medicine, London, UK).

#### ***Lung cancer and COPD***

It was assumed that there is no association (RR=1 for both genders and all age groups) between alcohol consumption and both lung cancer and COPD.

For lung cancer, this decision was based on the fact that the International Agency for Research on Cancer (IARC) monograph on alcoholic beverage consumption and ethyl carbamate, states that there is no confirmed evidence for an association between alcohol consumption and lung cancer<sup>26</sup>. Also, lung cancer is not included in the 2007 World Cancer Research Fund and American Institute for Cancer Research's report on food, nutrition, physical activity and the prevention of cancer<sup>25</sup>.

For COPD, Tabak et al.<sup>29</sup> observed a U-shaped curve between baseline alcohol consumption and 20-year COPD mortality in middle-aged men from three European countries; however, the differences between the "non-drinkers/occasional drinkers" group and light drinkers or with those with a higher alcohol consumption did not reach significance after adjustment for potential confounders. Furthermore, a more recent study by Greene et al.<sup>30</sup> found that alcohol intake was not associated with an increased risk of COPD exacerbation independent of tobacco use. Nor is there a plausible biological mechanism by which such a relationship could exist.

#### ***Ischaemic heart disease, stroke, diabetes mellitus and cancer of the colon/rectum, mouth/oropharynx, oesophagus and breast***

For all other health outcomes considered in this project, RR estimates were obtained from a paper by Rehm et al.<sup>1</sup>. The advantage of this paper is that it collated information from several

recent meta-analyses (six papers were used for the outcomes of interest to DYNAMO-HIA<sup>27,31,32,33,34,35</sup>) and presented them using the chosen exposure categories. For colorectal cancer, estimates were for cancers of the colon-rectum-anus, while for mouth and oropharynx cancer, estimates were cancers of the lip-mouth-pharynx.

### **3.5 Approach for selecting age and sex specific relative risks**

When reporting RR estimates for alcohol consumption, the following assumptions were made:

- a) For each outcome, the same RRs were applied to all countries, assuming no interaction between the level of intake and country on the associations; however, it is not possible to verify whether this assumption is true as the study populations covered by the literature reviews were from relatively limited numbers of countries, which did not allow comparisons between countries;
- b) Due to the limitations of the evidence for men and women separately, it was decided to apply the same relative risk estimates to both sexes for each outcome, unless otherwise specified;
- c) Due to the limited evidence available for children, it was decided to apply a relative risk of one for individuals under the age of 15 years (under the age of 16 for all cause mortality as per the paper by White et al.<sup>28</sup>); and
- d) For the other age groups, we assumed that the RRs are the same for all age groups, except for all-cause mortality for which we were able to obtain data by age group. We assumed no attenuation of the relative risks in the elderly because of the lack of information on variations in RRs by age group and on potential attenuation factors to be used at the extremes of age.

## **4. Provided data on risk factor-disease relationships**

RRs estimates are summarised in Table 5 below.

**Table 5. Relative risk estimates for the selected diseases by gender and category of alcohol consumption.**

Outcome	Males aged 15 years and over					Females aged 15 years and over				
	Drinking categories (g/d)					Drinking categories (g/d)				
	0 - <0.25	0.25 - <20	20 - <40	40 - <60	≥60	0 - <0.25	0.25 - <20	20 - <40	40 - <60	≥60
All-cause mortality										
16-24 years	1.00	1.07	1.25	1.48	1.88	1.00	1.04	1.17	1.31	1.58
25-34 years	1.00	1.05	1.21	1.40	1.75	1.00	1.04	1.15	1.29	1.54
35-44 years	1.00	1.00	1.10	1.23	1.47	1.00	1.03	1.15	1.30	1.56
45-54 years	1.00	0.96	1.01	1.10	1.26	1.00	1.02	1.13	1.26	1.51
55-64 years	1.00	0.94	0.98	1.04	1.16	1.00	1.00	1.09	1.22	1.46
65-74 years	1.00	0.94	0.97	1.02	1.11	1.00	0.99	1.06	1.17	1.38
75-84 years	1.00	0.95	0.97	1.02	1.11	1.00	0.98	1.05	1.15	1.35
85-95 years	1.00	0.96	0.98	1.02	1.09	1.00	0.98	1.03	1.12	1.27
Ischaemic heart disease (IHD)	1.00	0.82	0.82	0.87	1.13	1.00	0.82	0.82	0.87	1.13
Stroke	1.00	0.91	1.01	1.18	1.55	1.00	0.7	0.79	1.08	2.74
Diabetes mellitus	1.00	0.72	0.86	1.00	1.00	1.00	0.72	0.86	1.00	1.00
Chronic obstructive pulmonary disease (COPD)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Cancer of the lung	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Cancer of the colon and rectum	1.00	1.00	1.08	1.30	1.72	1.00	1.00	1.11	1.33	1.62
Cancer of the mouth and oropharynx	1.00	1.31	2.08	3.02	4.32	1.00	1.33	2.18	3.26	4.85
Breast cancer	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.23	1.42	1.68

## 5. Discussion of quantitative and qualitative sources of uncertainty in risk factor-disease relationships

There are several sources of uncertainty in risk assessment. Some of these will be described here with regard to the association of alcohol intake and health outcomes. It is likely that these underestimate the true level of uncertainty that affected the estimates presented in this report.

### 5.1 Potential sources of uncertainty related to the choice of data sources used

Within the framework of the Global Burden of Disease for the Year 2000, Rehm et al. reviewed key sources of uncertainty affecting alcohol consumption-disease relationships<sup>2</sup>. Among others, they pointed out the fact that research examining the relationship between alcohol intake and chronic disease vary in quality, and could be affected by potential selection bias (e.g. samples selected to minimise loss to follow-up and that may include more regular, low-to-moderate drinking styles) and measurement bias. A potential source of uncertainty indeed relates to the quality of the ascertainment of exposure in the original studies included in the meta-analyses used to obtain our RR estimates; this source of uncertainty was also discussed in Part 1-Section 5. For example: most studies only measure exposure at one point in time; alcohol consumption may have been underreported in several studies (which would have lead to an underestimation in case of selective underreporting by cases<sup>2</sup>); and few studies examined beverage-specific risks or drinking patterns although these could modify the shape of the dose–response function<sup>36</sup>.

Corrao et al.<sup>36</sup> also suggest that the generalisability of pooled estimates from meta-analyses may be limited by the strong evidence of heterogeneity across studies and by potential publication bias (e.g. small studies reporting harmful effects may be less likely to be included than small studies reporting protective effects). Another potential source of uncertainty is that confounding is a possibility in observational studies of the relationship between alcohol consumption and health outcomes. Although studies used in meta-analyses generally attempt to adjust for confounding, measurement error in the assessment of potential confounders and the possibility of residual confounding need to be considered.

### 5.2 Other potential sources of uncertainty

In this project it was assumed that for most chronic diseases the level of uncertainty introduced by application of findings from one population to another is relatively small since the relationships depend on fundamental biological mechanisms<sup>2</sup>. IHD is an exception, however, as significant effect of the region in which the study was conducted was reported by Corrao et al.<sup>36</sup>. This suggests that the effect of alcohol consumption may be modulated by the presence of other risk or protective factors, or by unrecorded aspects of consumption (beverage type, pattern etc.) .

Notwithstanding this limitation, in the absence of robust evidence about what adjustments might be needed, we assumed that the same relative risks (RR) could be applied to all countries (assuming no interactions), and to both genders (unless otherwise specified). We also applied RR=1 to all those under the age of 15 years (with the exception of 16 years for all-cause mortality) and for all other age groups (again, except for all-cause mortality).

### 5.3 Comparability

The same RRs were used for all countries; hence comparability is not an issue here.

## Annex 1 – Details of the exposure data identified

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### Austria

#### *Surveys used*

- No survey data met the inclusion criteria.

#### *Surveys not used*

Austrian Health Interview Survey 2006/2007<sup>37</sup> (also in 1983, 1991, 1999) (conducted by Statistik Austria)

- Number of individuals sampled=25,130; Response rate=61.6%; thus Final sample size=15,480
- Data were collected via face-to-face interviews
- The survey report<sup>37</sup> provides information on: whether alcohol was consumed during the past 12 months; whether alcohol was consumed during the past 4 weeks; and alcohol consumption on the day before the survey among those who reported having drunk alcohol on the previous day. The data provided in the report is insufficient for DYNAMO-HIA
- Not used as we were unable to contact the authors of the report to obtain more detailed results.

Eurobarometer 186/Wave 59: Health, food and alcohol and safety, 2003<sup>38</sup>

- Survey conducted in January-February 2003 in 16 European countries (Germany was divided in Eastern and Western Germany) with only around 1000 individuals per country.
- N=1022 individuals aged 18 years and over
- Not used as small sample size.

Eurobarometer 272b: Attitudes towards Alcohol, 2006<sup>39</sup>

- Survey conducted in October-November 2006 in 30 European countries but with only around 1000 individuals per country. The report presents only aggregated data.
- The questionnaire asked whether alcohol was consumed during the past 4 weeks, and if so, about the number of days beer, wine and spirits were consumed during the same period, and about the number of drinks usually consumed on a drinking day.
- Not used as small sample size.

European School Survey Project on Alcohol and other Drugs (ESPAD)<sup>40</sup>

- Conducted in 2003, 2007 (in some countries also in 1995 and 1999)
- Children aged 15-16 years only
- Difficult to assess usual intake: while there are questions on frequency, it includes a question about the volume consumed only on the last day for different types of drinks
- Not used as limited age range and estimates of alcohol consumption not sufficiently precise to assess usual intake.

GENACIS Study (Gender, Alcohol and Culture: An International Study) – 1993<sup>41</sup>

- National survey conducted in 1993
- N=7475 individuals aged 15 years and over
- Not used as relatively old survey.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey<sup>42</sup> (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- Survey conducted in 39 countries in 2005-2006, for children aged 11, 13, and 15 – thus only age 15 would be useful for us (very narrow age range).
- Data presented in the report discuss frequency of consumption but no information is presented on the usual amounts consumed.
- Not used as limited age range and no information on usual amounts consumed.

Health Report Austria 2004 (reporting period 1992-2001)<sup>43</sup>

- Published by the Austrian Federal Ministry of Health & Women. The report has maps showing the regional distribution of consumption and information on regional mortality potentially related to alcohol consumption, but no individual consumption by age and gender.
- Not used as data are not available in the format required.

National Substance Use and Abuse GPS 2008<sup>44</sup>

- Survey conducted between October and December 2008.
- N=4196 individuals aged 15-99 years; but participation rate was only 34.4%.
- Stratified random sample from a nationwide address list of households in which one person was selected using the last birthday method. To make the dataset representative for the Austrian population, age groups were made and weighted using information on the age distribution of the Austrian population.
- Data were collected by face-to-face interviews.
- Information on daily alcohol was derived from several questions: (as per Personal correspondence with Dr Alfred Uhl, Ludwig Boltzmann Institute, Austria): a) Detailed alcohol consumption of the previous day (type of alcoholic beverage, amount consumed - pure alcohol intake was calculated later); b) last week's daily consumption in standard units by type of alcoholic beverage; c) overall frequency of alcohol consumption (lifetime abstainers, almost lifetime abstainers, etc.); d) Number of days of consumption in the past 12 months; e) age of onset; f) Number of days of consumption in the past 30 days. Data provided to us were based on alcohol consumption during the previous week and were adjusted for potential under-sampling, underreporting and forgetting bias (Personal communication, J Strizek, Ludwig-Boltzmann-Institut für Suchtforschung (LBISucht) am Anton-Proksch-Institut (API), Austria).
- Not used as very low response rate.

Survey conducted in 1993/1994<sup>45</sup>, mentioned in the WHO Global Status Report on Alcohol 2004<sup>8</sup>

- N=11,150 individuals
- Not used as relatively old survey and lack of information on the methods used and estimates of intakes.

World Health Survey 2003 (WHO) – Report of Austria<sup>46</sup>

- Survey conducted in 2003
- N=1055 individuals

- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Belgium**

### *Surveys used*

- No survey data were obtained as we were unable to get data from the Belgium Interview Survey (HIS) in the format required for DYNAMO-HIA – see below.

### *Surveys not used*

Belgium Health Interview Survey (HIS) 1997, 2001, 2004, 2008<sup>47</sup>

- National surveys conducted in 1997 (N=8259), 2001 (N= 9321), 2004 (N=9531), and 2008 (data not available at the time of data collection) for individuals aged 15 years and over
- National sampling stratified by region, province and community, and constructed on the basis of the National Register using the household as the sampling unit
- Data were collected using face-to-face interviews and self-completed questionnaires. Questions related to alcohol consumption were included in the self-completed questionnaire and were filled in by respondents aged 15 years and over.
- The questionnaire includes 13 questions related to alcohol, some of which concerning the frequency and amounts consumed, i.e. whether different types of alcoholic beverages had been consumed during the previous 12 months, and the number of days when alcohol is usually consumed between Monday-Thursday and Friday-Sunday, and the usual number of servings consumed on those days.
- Some alcohol consumption data are available on the Interactive website: <http://www.iph.fgov.be/epidemo/hisia/> (most recently from the 2004 Survey data). However, they are not in a format that could be used or adapted for DYNAMO-HIA.
- Data from the 2004 survey could not be used as we were unable to obtain a copy of the dataset or to have data re-analysed for us. We were unable to obtain the permission for using data for 2001 (which were used by the Eurothine Project Research Group).

Eurobarometer 186/Wave 59: Health, food and alcohol and safety<sup>39</sup>

- See comments under Austria

Eurobarometer 272b: Attitudes towards Alcohol<sup>40</sup>

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)<sup>40</sup>

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

SHARE 2004, SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe

- See comments under Austria

### World Health Survey 2003 (WHO) – Report of Belgium<sup>48</sup>

- Survey conducted in 2003
- N=1011 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on the recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

### **Bulgaria**

#### *Surveys used*

- No survey data met the inclusion criteria.

#### *Surveys not used*

Bulgaria 2001 Survey of the Health Status of the Population (Health Interview Survey – see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Individuals aged 15 years and over
- The survey asked about the overall frequency of alcohol consumption during the past year (Regularly/Sometimes/Occasionally only/No); whether the respondents have drunk alcohol in the past month; the types of alcoholic beverages (beer, wine, rakia, liqueur/vermouth, vodka/whiskey, cognac, gin, brandy, mastika, cocktails) they drunk weekly; how often they are drunk (daily, 3-4 times a week, seldom); and what quantities are consumed for each type of drinks they usually consume daily. It would be difficult to obtain a good estimate of alcohol consumption based on these questions.
- Not used as we could not obtain a response to our enquiries to the National Statistical Institute

#### CINDI-Bulgaria survey 2002<sup>49</sup>

- N=2400 individuals aged 25-64 years selected at the regional level (CINDI “Demonstration area”) by simple random sampling from the population register; Response rate=75%
- Data were collected by personal interview.
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as we have not been able to have access to the dataset or to have data reanalysed for us.

#### Cross National Student Health Survey<sup>50</sup> (the year of survey varied among countries)

- 5826 students at universities in seven European countries: Bulgaria, Denmark, Germany, Lithuania, Poland, Spain, and Turkey. Thus, only university students (unrepresentative population).
- Asked about frequency of alcohol consumption but not amounts consumed.
- Not selected as the survey includes only university students and because it does not provide estimates of the amounts of alcohol consumed

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

#### National Nutrition Survey 2004<sup>51,52</sup>

- N=853 individuals aged 16-64 years
- Estimates food and alcohol consumption based on one 24-hour recall
- Not used as small sample size and based on only one 24-hour recall

#### Sofia Heart Study 1994<sup>53</sup>

- Country-wide household survey of adults aged 18 years and over, N=1547
- Estimates based on general frequency of consumption and reported amounts consumed per week (grams of spirits/week, 750ml bottles of wine/week, 500ml bottles of beer/week)
- Not used as survey is relatively old and relatively small sample size

#### Study of health lifestyle behaviours in selected cities in Bulgaria and Scotland<sup>54</sup>

- Conducted in 1994 in 268 respondents from Varna, Bulgaria, 827 respondents from Glasgow, Scotland and 275 respondents from Edinburgh, Scotland
- Information is available on whether alcohol was consumed during the previous month, but no information on quantities reported
- Not used as the study is old, the small sample size is small and the study was conducted only in selected cities.

#### WHO collaborative project on early detection of persons with harmful alcohol consumption<sup>55</sup>

- 1888 subjects in Australia, Bulgaria, Kenya, Mexico, Norway and the USA who underwent a comprehensive assessment of their medical history, alcohol intake, drinking practices, and any physical or psychosocial problems related to alcohol.
- Not used as relatively old study and sample size.

## Cyprus

### *Surveys used*

- No survey data met the inclusion criteria.

### *Surveys not used*

#### Cyprus Health Survey (Health Interview Survey) 2003<sup>56</sup>

- Conducted by the Statistical Service of the Republic of Cyprus ([http://www.mof.gov.cy/mof/cystat/statistics.nsf/index\\_en/index\\_en?OpenDocument](http://www.mof.gov.cy/mof/cystat/statistics.nsf/index_en/index_en?OpenDocument))
- Multi-stage probability sample of private households (of permanent residents of Cyprus) with data collected on all household members
- N = 1792 households and 5617 individuals; response rate 91%
- Data were collected by means of interviews
- For alcohol, the questionnaire asked whether the respondent had drunk any beer, wine or any other alcoholic drinks during the past 12 months (yes/no) and during the past 4 weeks, how many days (during the past 4 weeks) he/she had drunk any alcohol, and how many glasses were drunk on average on those days.

- The survey report includes summary data on alcohol consumption but not the dataset
- Some data were provided to us by the Statistical Service of the Republic of Cyprus but they were not in the format required for this project; data could not be re-analysed for us.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

#### Rick Factor (CINDI) Survey on Noncommunicable Diseases in Nicosia District (HIS/HES)<sup>57</sup>

- Survey conducted in 1999-2000
- Includes 1250 households and 1600 individuals aged 25-64 years; 11% refusal rate at the household level and 33% at the individual level
- Not used as only asking about the number of bottles, tins, or glasses of beer, wine, spirits they had during the past seven days (not our favoured assessment method)

#### Study examining diet, lifestyle factors and hypercholesterolemia in elderly men and women from Cyprus<sup>58</sup>

- Study conducted in 2004/2005
- N= 150 individuals aged 65 years and over.
- Alcohol consumption was estimated as daily ethanol intake, in wineglasses.
- Not used as very small sample size, limited age range and limited information on alcohol intake.

## **Czech Rep**

### *Surveys used*

#### Sample Survey of the Health Status of the Czech Population 2002, 2008 (conducted every 3<sup>rd</sup> year since 1993)<sup>59</sup>

- Conducted by the Institute of Health Information and Statistics of the Czech Republic (IHIS CR); data from the 2008 survey will not be available until early 2010 but data from 2002 are available
- Multi-stage random national sample; obtained in a three-stage random selection. The first stage was the selection of (270) municipalities, the second stage was a simple random selection of the necessary number of streets or parts (500 altogether) in the municipalities, and in the third stage, seven persons were randomly selected in each street (part)
- Final sample size: 2476 respondents aged 15 years and over; Response rate=70.7%
- Data were conducted by face-to-face interview. Questions asked about frequency and amounts consumed over the previous 4 weeks: 1) how long ago the respondent had an alcoholic drink; 2) in the past 4 weeks on how many days the respondent had drunk beer, wine, spirits, appetizers (other alcoholic beverages); 3) on a day when this type of alcohol was drunk, how much the respondent usually drank, and 4) whether drinking in the past 4 weeks was typical of usual drinking in the past year. The average weekly alcohol dose was calculated.

- Data in the format required for DYNAMO were provided by the Institute of Health Information and Statistics of the Czech Republic (IHIS CR).

### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- SHARE is a multi-disciplinary and cross-national panel database of micro-data on health, socio-economic status and social and family networks of European non-institutionalised individuals aged 50 years and over (spouses aged less than 50 years were also interviewed). It is co-ordinated centrally at the Mannheim Research Institute for the Economics of Aging (MEA).
- In 2004 (the first wave of data collection) >45,000 individuals (eleven countries) were included
- The second wave of data collection (2006-07) included fourteen EU countries.
- In the first wave, full probability sampling was undertaken in all participating countries.
- In the second wave, respondents from the first wave were re-contacted, thus the 'longitudinal' design. Also, a "refresher" sample was drawn in all first wave countries except Austria and the Flemish part of Belgium.
- All data were collected by face-to-face, computer-aided personal interviews (CAPI), supplemented by a self-completion paper and pencil questionnaire.
- SHARE data was used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

#### *Surveys not used*

##### CINDI Health Monitor – Czech Republic survey 2002<sup>49</sup>

- N=3050 individuals aged 25-64 years selected at the national level by simple random sampling from electoral lists; Response rate=66%
- Data collected by personal interview.
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as alcohol intake based on the consumption during the last seven days (not our favoured assessment method) and we have data from another survey

##### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

##### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

##### GENACIS Study (Gender, Alcohol and Culture: An International Study) - 2002<sup>41</sup>

- National survey conducted in 2002
- N= 2526 individuals aged 20-64years; Response rate: 72.6%
- Not used as we have not been able to reach the authors (no response to our enquiries).

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Monica study – Czech Republic<sup>61,62</sup>

- Study conducted in 1992
- N= 1141 men and 1212 women aged 25–64 years, randomly selected from the population registers of six Czech districts
- Not used as relatively old study.

Study by Bobak et al. 2004<sup>63</sup> looking at drinking patterns in one Czech, one Polish and one Russian city

- Study conducted in 1999-2000, but only in men and women aged 45-64, and only in one city
- Not used as relatively limited age range and conducted in only one city.

Study by Kubicka and Czémy 2004 looking at the sociodemographic context of alcohol use in the Czech adult population from the health perspective<sup>64</sup>

- Sample of 1224 men and 1282 women aged 18-64 years, representative of the Czech population of this age range
- Data collected by means of personal interviews. Questions enquired about the frequency of consumption of beer, wine and spirits, usual quantities consumed per occasion, and frequency of consuming  $\geq 75$ g alcohol at a single occasion
- Not used as we have not been get an answer to our enquiries.

Study by Mayer et al.<sup>65</sup> of the association of beer intake with homocysteine and folate blood concentrations

- Population survey of 292 males and 251 females aged 35-65 years (mean age 53 years) residents of Pilsen (Czech Republic) and vicinity, selected from the PILS II study
- Not used as very small sample size and conducted in only in one city

Study by Page et al.<sup>66</sup> of alcohol use and related social normative perceptions in Central and Eastern European adolescents

- Conducted in 2005 among 1,886 Central-Eastern European high school students (mean age 16.5 years), from several localities in the countries of Hungary, Slovakia, Czech Republic, and Romania
- Not used as small sample size in each country, and only from selected cities

Study by Wilsnack et al. 2000<sup>67</sup> and looking at cross-cultural patterns in alcohol intake

- Czech data based on data from Kubicicka et al.<sup>68</sup> from 1992-1993, with 586 men and 608 women aged 25 to 54 years old.
- Not used as only from Prague, narrow age range and relatively small sample size.

Survey of the Czech population<sup>69</sup>

- It is unclear what type of information on alcohol consumption was collected
- Not used as the report is only in the Czech language; no response from the author to our enquiries

World Health Survey (WHO) – Report of Czech Republic 2003<sup>70</sup>

- Survey conducted in 2003
- N=929 individuals aged 18 years and over

- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Denmark**

### *Surveys used*

#### Danish National Health Interview Surveys 2005<sup>71</sup>

- Conducted in 2005 by the National Institute of Public Health (at the University of Southern Denmark)
- Randomised sample of 21,832 Danish citizens aged 16 years and over; Response rate=67% (14,566 completed the interview). Some respondents did not complete the alcohol questions; therefore a total 14,426 respondents formed the data provided by the National Institute of Public Health (as below).
- Data were collected via face-to-face interviews at the respondents' home and self-completed questionnaires.
- In the self-completed questionnaire, three questions concerned alcohol consumption: 1. How often do you have a drink containing alcohol? (Never/ Monthly/ 2–4 times a month/ 2–3 times a week/ 4 or more times a week); 2. How many drinks containing alcohol do you have on a typical day when you are drinking? (1–2 drinks/ 3–4 drinks/ 5–6 drinks/ 7–9 drinks/ 10 or more drinks); 3. How often do you have five or more drinks on one occasion? During the face-to-face interview, the interviewer asked about the number of standard drinks consumed during each day of the previous week. Data from the interviews were used for the estimation of alcohol intake since the response rates were much higher for this questionnaire and because the alcohol intake estimates were found to be more reliable (higher) in this questionnaire (Personal communication Ola Ekholm, National Institute of Public Health). It was assumed that a standard drink provided 12 grams of pure alcohol.
- Data were provided (in DYNAMO-HIA format) by Ola Ekholm at the National Institute of Public Health.

#### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under the Czech Republic
- SHARE data was used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

### *Surveys not used*

#### Copenhagen City Heart Study<sup>72,73</sup>

- Prospective population study designed to evaluate incidence of, and risk factors for, cardiovascular disease
- Random sample of approximately 20,000 people with baseline information collected in 1976-1978, response rate 74%
- Alcohol intake assessed by questionnaire
- Not used as baseline data are old and only from the Copenhagen area – so not representative of Denmark.

#### Cross National Student Health Survey

- See comments under Bulgaria

Danish Health and Morbidity Survey (SUSY) 2000 (also 1987, 1994)

- Conducted by the National Institute of Public Health. A summary is available at: <http://www.susy.si-folkesundhed.dk/>
- N=22,486 individuals aged 16 years and over who were Danish citizens; Response rate=74.2%
- Includes questions about alcohol consumption but not in the format required by DYNAMO-HIA
- Not used as we could not get a response to several enquiries to the NIPH and Centre for Health & Society (Denmark) for the dataset

Danish Health Interview Survey 2000 (WHO Global NCD Infobase - <https://apps.who.int/infobase/mddetails.aspx?surveycode=100971a1>)

- National, stratified sample with a final sample size of 16,690; Response rate=74.2%
- Data collected through interviewer-administered questionnaire.
- Includes information on the prevalence of individuals who consume alcohol (daily) and on abstainers by sex and age group but not on the prevalence of alcohol consumption by consumption categories.
- Not used as alcohol consumption data are not available in the format required by the project.

Danish National Board of Health - 'Alcohol Habits 2008' report<sup>74</sup>

- Report is in Danish so we are unclear whether it would contain the required information (although the data are unlikely to be directly in the format required for DYNAMO-HIA)
- Not used as report is in Danish and we have had no response to our email enquiries

EPIC – European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Participants are aged 20 years and over (but mostly aged 30-75 at enrolment)
- Individuals were recruited between 1993-1999, from the general population residing in defined areas in each country with some exceptions. In Denmark, population-based samples of individuals born in Denmark (men and women aged 50-64 years and without prevalent cancer) were selected in Århus and Copenhagen
- Not used as highly selected population and limited age range.

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

GENACIS study (Gender, Alcohol and Culture: An International Study) – 2003<sup>41</sup>

- National survey conducted in 2003
- N=2030 individuals aged 15 years and over; Response rate 40%
- Not used due to poor response rate

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB. The HBSC has been conducted in several countries since 1983/1984. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries are included in all surveys)

- See comments under Austria

National telephone surveys of the Danish General population 2003 -2006<sup>76,77</sup>

- National telephone survey of Danish general population conducted in 2003 and 2006 with random digit dialling (RDD) and computer-assisted telephone interviewing (CATI).
- Respondents aged 15-99 years
- In 2003: N=2030; Co-operation rate=50%; In 2006: N=1027; Co-operation rate=70.7%
- Alcohol consumption was measured with beverage specific quantity-frequency questions. An additional question asked about frequency of heavy episodic drinking
- Data not used due to the relatively low response rate in 2003 and relatively small sample size in 2006, and availability of other sources of data for Denmark.

SHARE 2004, 2006-2007: Study of Health, Aging, and Retirement in Europe

- See comments under Austria

World Health Survey (WHO) – Report of Denmark<sup>78</sup>

- Survey conducted in 2003
- N=1001 individuals
- Alcohol tables and data are missing in the report
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Estonia**

### ***Surveys used***

Estonian Health Interview Survey (EHIS) 2006 (also conducted in 1996)<sup>79</sup>

- Conducted by the National Institute for Health Development (NIHD) of Estonia
- Nationwide survey of permanent residents of Estonia on 1 January 2006, aged 15-84 years. Selected by stratified systematic sampling using the Population Registry (held by AS Andmevara) as the population frame.
- N= 6434 individuals aged 15-84 years; Response rate: 58.4%
- Data collected by face-to-face interview
- Survey questions asked about quantity and frequency of consumption for each of beer, wine, 'light alcohol' and vodka over the previous 4 weeks.
- Data (unweighted) for the 2006 survey were provided by Ardo Matsi of the National Institute for Health Development (NIHD) of Estonia.

### ***Surveys not used***

Baltic Nutrition Survey 1997<sup>80</sup>

- N=2010 individuals aged 19 to 64 years

- Estimated alcohol consumption during the last 7 days (which tend to underestimate alcohol consumption and overestimate the proportion of respondents with low intakes)
- Not used as survey relatively old

#### CINDI Health Monitor 2000-2002 – Estonia<sup>49</sup>

- No information on sample size and age groups found in the document
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as we were unable to reach Estonian CINDI contacts

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Health Behaviour among Estonian Adult Population 2002<sup>81</sup>, 2004<sup>82</sup>

- Used to provide the FINBALT Health Monitor data
- Nationally representative postal surveys conducted in Estonia every two years, with data on alcohol since 1994 in Estonia
- Conducted by the National Institute for Health Development (NIHD) of Estonia
- Individuals aged 16-64 years; unable to find data on sample size
- Questions on alcohol asked whether any alcohol had been consumed during the previous twelve months, and about alcohol consumption during the last week for different types of alcoholic beverages (medium strong or strong beer, free-mixed highballs, strong alcohol/spirits, wine or equivalent). Results from the survey showed that the distribution of weekly alcohol consumption tended to be skewed to the right, indicating that the proportion of non-drinkers and moderate drinkers is substantial (as with other methods using estimates based on last 7 days).
- In response to our enquiries, we were sent the questionnaire, but we were unable to obtain the data.

#### Norbalt I (1994) and II (1999)<sup>83</sup>

- Conducted simultaneously in Estonia, Latvia and Lithuania
- Estonia: 1994: N=4883 households, 1999: N=5500 households; Age of respondents: 18 years and over
- In 1994, the question concerned how many units of beer, wine and spirits the respondent had had on average on the days he or she had consumed alcohol in the past two weeks. In 1999, the respondents were asked specifically about how much they had consumed of the same beverage categories as above on the last occasion they had consumed alcohol. Thus 1994 data would offer better estimates of usual intake.

- Not used as relatively old data and limited information on frequencies of consumption.

Study by Reitan<sup>84</sup> – Surveys conducted in 2001 in Estonia, Latvia, Lithuania, Poland

- N=1114 in Estonia, N=1100 in Latvia, N=1130 in Lithuania, N=1100 in Poland
- Methods to assess alcohol intake similar to those used in the ECAS study.
- Not selected as the report describes frequency but not the quantities consumed.

Study reported by Wilsnack<sup>85</sup>

- National survey conducted in 1993
- N= 835 men and 984 women aged 18 to 70 years
- No estimates of quantities of alcohol consumed are reported, only frequencies
- Not used as old survey and data available are not in the format required

Tallin 1999–2001 regional survey<sup>86</sup>

- N= 636 males and 676 females, aged 20–54 years
- Not clear from the data available which alcohol variables are available
- Not used as conducted only in one city

World Health Survey (WHO) 2003 - Report of Estonia<sup>87</sup>

- Survey conducted in 2003
- N=992 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Finland**

### *Surveys used*

Finnish Drinking Habit Surveys – 1969, 1976, 1984, 1992, 1996, 2000, 2008 <sup>88,89</sup>

- Simple random sample from the population of Finland aged 15-69 years excluding the Åland island, individuals who are institutionalized and those without a permanent address.
- In 2008: N=2725; Response rate=74%
- Data were collected using face-to-face interviews.
- Includes several ways of asking about alcohol consumption: One is a 7-day recall measure, another is a (12-month) beverage-specific (typical) quantity-frequency, a third method is based on graduated frequency measure (how often 1-2, 3-4, 5-7, 8-12, 13-17, 18+ units).
- Data from the 2008 survey were provided by Petri Huhtanen (a colleague of Pia Makela) of the National Public Health Institute (KTL). We considered combining the 2000 and 2008 data, however Petri Huhtanen that alcohol consumption appeared to have increased considerably in Finland during that period based on per capita alcohol consumption statistics in Finland (increased by 17 % between 2000 and 2008). As well, the Drinking Habits Surveys' data showed that there were different changes in alcohol consumption between age and gender groups. It was thus decided to use only the 2008 data. The 12-month beverage-specific quantity-frequency questions were used to derive individual alcohol intakes.

### *Surveys not used*

#### Alcohol and Drug Monitoring Surveys – 2002, 2004, 2006, 2008<sup>90</sup>

- Surveys of Finns aged 15-69 years randomly selected from population registers to gather information on prevalence and use patterns of alcohol and drugs, perceived harms, alcohol attitudes and drug-policy views.
- The information is collected by Statistics Finland using mailed questionnaires (returned anonymously)
- Data were not used as Statistics Finland said that: they do not have appropriate information and referred us to the National Public Health Institute

#### CINDI Health Monitor – Finland 2002<sup>49</sup>

- N=5000 individuals aged 15-64 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- The CINDI contacts are from the same group at the National Public Health Institute that has provided us with the more recent 2008 ‘Drinking Habits Survey’ data
- Not selected as not a preferential choice since the estimation of alcohol consumption is based on the recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

#### ECAS study – European Comparative Alcohol Study - 2000<sup>91</sup>

- Surveys in Finland, France, Italy, Germany, Sweden, UK
- Only approximately 1000 randomly selected individuals in each country, 18-64 years
- Includes questions on usual frequency of consumption and volume per occasion summed across all alcoholic beverages so that total alcohol consumption could be calculated
- Not used as questions were raised with regards to the comparability of the results as large differences were found among the six samples in response rates and in estimates of volume of drinking in relation to recorded per capita consumption (coverage rate)

#### ESPAD - European School Survey Project on Alcohol and other Drugs

- See comments under Austria

#### Finnish Health Care Survey 1996 (<https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as data are relatively old and other data were available

#### FINRISK study<sup>92</sup>

- Conducted by the National Public Health Institute of Finland (KTL) every five years since 1972, using independent, random and representative population samples from different areas of Finland
- The most recent survey took place in 2007. It was carried out in five areas in Finland, in each area, 2000 persons aged 25-74 years were invited to participate, for a total of approximately 10,000 individuals.
- The 2007 survey includes five questions on alcohol consumption, including questions on the frequency of consumption and on whether alcohol was consumed in the past 12 months (which can be used to calculate the proportion of abstainers); the

questionnaire also asks about the quantities of alcohol consumed during the past 7 days. Data would need to be re-analysed.

- Not selected as we could not obtain a response to our enquiries for assistance.

GENACIS (Gender, Alcohol and Culture: An International Study) – 2000<sup>41</sup>

- National survey conducted in 2000
- N=1931 individuals aged 16-70 years; Response rate=79.4%
- Not selected as data were relatively old and more recent data were available (above)

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Health 2000 Survey<sup>93</sup>

- Survey coordinated by the KTL with data collected from the fall of 2000 to the spring of 2001
- Nationally representative two-stage cluster sample of approximately 10,000 adults aged 18 years and over
- Fieldwork included an interview at home (or institution), a health examination in a local health centre or comparable premises, an interview and a health examination of non respondents at home (or institution), a telephone interview and/or a mailed questionnaire for the remaining non respondents.
- Included several questions relating to alcohol consumption, including a set of quantity-frequency questions.
- Not selected as we could not obtain a response to our enquiries for assistance.

Health Behaviour Among the Finnish Adult Population<sup>94</sup> (this series of surveys provides the data to FINBALT Health Monitor)

- Since 1978, KTL has annually monitored the health behaviour of the adult population through postal surveys. Each year a random sample (N=5000) of Finnish citizens aged 15-64 years has been drawn from the Population Register. The average response rate has been 70% among men and 80% among women. To date, the data include responses from 53,421 men and 59,175 women.
- Data on alcohol have been collected since 1994
- Includes different questions on alcohol consumption, including on intake during the last week ('How many glasses (regular restaurant portions) or bottles of the following drinks have you consumed during the last week (7 days)? If you have not had any, mark 0, i. medium strong or strong beer \_\_ bottles, ii. free-mixed highballs \_\_ bottles, iii. strong alcohol, spirits \_\_ restaurant portions (4 cl.), iv. wine or equivalent \_\_ glasses.')
- The report is in Finnish, but parts also in English. Tables 89A onwards present the alcohol consumption data; separate tables present results for the consumption of beer, 'long drinks', 'strong alcohol' and wine, in selected consumption categories ('Not at all', 1-2 bottles, 3-4 bottles, >4 bottles) by age and sex, for the past 7 days.
- It is unclear what the conversion factors used are, i.e. how much alcohol is assumed to be present in regular restaurant portion sizes. There was thus insufficient data for DYNAMO-HIA.
- Not selected as we could not obtain a response to our enquiries for assistance.

### Health Behaviour Among the Finnish Elderly Population<sup>95</sup>

- Conducted every two years since 1985 (except 1991) by KTL to obtain information about living conditions, health status, lifestyle and coping with daily activities among Finnish citizens aged 65-84 years.
- Samples are selected by stratified random sampling of 300 men and women in five-year age groups drawn from the National Population Register. Until 1989 the age range was 65-79, thereafter 65-84. Thus the sample size was 1800 in the first three surveys, and 2400 in the later surveys. The average response rate has been approximately 80%. The total number of 65 to 84-year-old respondents in 1985-2007 is 19,660.
- Data collected using a postal questionnaire
- Not selected as relatively narrow age range

### Mini-Finland Health Survey – carried out between 1978 and 1980 in the whole country<sup>96</sup>

- Designed to assess the health of Finnish adults aged 30 years and over
- N=8000, of whom 7217 (90%) participated in a health examination
- Not used as data relatively old.

### World Health Survey (WHO) 2004 – Report of Finland<sup>97</sup>

- N=1013 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## France

### *Survey used*

#### National Survey of Nutrition and Health – Etude nationale nutrition santé (ENNS) 2006/07<sup>98</sup>

- Cross-sectional population-based survey conducted February 2006-March 2007
- Respondents selected using a multi-stage sampling process
- N=3115 respondents aged 18-74-years; Response rate= 59.7 %
- Assessment of alcohol intake was derived from: 1) identification of abstainers from recalls and questionnaire; 2) among consumers: intake based primarily on the dietary recalls, otherwise based on questionnaire data (see summary at end of the reference cited above for further explanation)
- Data were provided by Katia Castebon at the Unité de Surveillance et d'Epidémiologie Nutritionnelle at The Université of Paris

#### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

### *Surveys not used*

#### Baromètre Santé (Health Barometer) 2000<sup>99</sup>

- N=13685 individuals aged 12-75 years
- Alcohol questions asked whether alcohol was consumed during the past 12 months. They also asked about the frequency of alcohol consumption during the last 7 days,

complemented with the amounts consumed on the previous day (only) and on the previous Saturday

- Not selected as the questions used do not allow for a satisfactory estimation of consumption frequency by age group and gender

#### ECAS study – European Comparative Alcohol Study - 2000

- See comments under Finland

#### Enquête décennale de santé (ES) 2002-2003<sup>100</sup>

- Conducted by the “Institut National de la Statistique et des Etudes Economiques” (INSEE)
- Households were chosen at random and all members of the households were included in the study
- N=24,145 individuals aged 16 years and over who completed all parts of the interviews and self-completed questionnaire (selected sample for the analyses described in the report referenced above)
- The questions related to alcohol consumption concerned, among others, the overall frequency of alcohol intake, and the usual number of glasses or tins of wine, beer and spirits consumed on days when alcohol is consumed
- Not selected as published data are not in the required format and relatively limited estimation of usual alcohol intake compared with the survey selected.

#### Enquête santé et protection sociale (ESPS) 2002<sup>100</sup>

- The sampling framework consisted of people covered by one of the three main Social Security systems (representing approximately 95% of the national population).
- N=11,172 individuals aged 15 years and over
- Data were collected by interviews, mainly carried out by telephone
- Alcohol consumption was estimated by enquiring about the overall frequency of alcohol consumption and about the number of glasses of alcohol drunk on the days when alcohol is consumed
- Not selected as published data available are not in the required format and relatively limited estimation of usual alcohol intake.

#### EPIC – European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In France: Nation-wide health insurance programme (MGEN): teachers and school workers enrolled in an ongoing study prior to EPIC
- In France, the study recruited women aged 40–65 in 1990
- Not selected as it included only a highly selective group of women from a limited age range

#### ESCAPAD study – Enquête sur la santé et les comportements lors de l'appel de préparation à la défense<sup>101</sup>

- Includes adolescents aged about 16-23 (but a majority aged 17) years who have to attend a Roll Call Day of Preparation for Defense (RCDPD), organized in civilian or military centers spread over the whole national territory

- Not selected as data were collected in less details than in the ENNS survey

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

GENACIS (Gender, Alcohol and Culture: An International Study) - 1999<sup>41</sup>

- National survey conducted in 1999 using telephone interviews
- N=13584 individuals aged 12-75 years; Response rate=71.3%
- Not selected as data are relatively old

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Health and care interview survey (Enquête sur la santé et les soins médicaux) – 2002 (also in 1960; 1970; 1980; 1991/1992; 1996; see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Part of the HIS surveys
- Conducted by the National Institute for Statistics & Economic Studies – INSEE
- The national sample consists of 16,848 households and 40,865 individuals
- Not selected as further information not available electronically; no response to our enquiries to the INSEE

IHPAF study – (study of hypertension)<sup>102</sup> – 1997-1998

- N= 17,359 men and 12,267 women from the working population
- Not selected as includes only individuals from the working population

PRIME study – Prospective Epidemiological Study of Myocardial Infarction<sup>103</sup>

- Established in 1991 in the populations of four collaborating centres of Belfast (United Kingdom), Lille, Strasbourg, and Toulouse (France)
- Includes men aged 50-59 years
- Not selected as conducted only in selected cities, only in men, and limited age range

Study by Cohidon et al. published in 2005<sup>104</sup>

- N=6571 individuals aged 18-74 years from the general population of the Lorraine region
- Not selected as conducted only in one region of France

SU.VI.MAX Study which started in 1994-1995<sup>105</sup>

- In 1994-95, 5,141 men aged 45 to 62 years and 7,876 women aged 35 to 62 years were included in the study for a planned follow-up of 8 years. The study was initially designed as a randomised, double blind, placebo-controlled, primary prevention trial to test the efficacy of daily supplementation with antioxidant vitamins and minerals at nutritional doses in reducing the incidence of ischemic heart disease and cancers
- Alcohol intake was estimated in grams of alcohol per day from a short validated semi-quantitative dietary questionnaire<sup>106</sup>

- Not selected as limited age range and relatively old

#### Three-City Study (3C) – 1999-2000

- Study on the vascular risk factors of dementia
- N=9294 community dwellers aged 65 years and above, registered on the electoral rolls and living in the cities of Bordeaux (n=2104), Dijon (n=4931) and Montpellier (n=2259)
- Not selected as conducted in only three cities

#### World Health Survey (WHO) 2003 – Report of France<sup>107</sup>

- N=1008 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Germany

### *Survey used*

#### German Epidemiological Survey of Substance Abuse (ESA) - 2006

- Participants were selected using a two-stage probability sampling design. At the first stage 225 communities stratified by region and community size were selected proportional to population size. At the second stage individuals were randomly selected from population registers. Younger individuals were disproportionately oversampled.
- N=7912 individuals (out of 21,463 selected) aged 18-64 years; Response rate=45%.
- Data were collected by mailed self-administered questionnaire (6598 respondents) or by telephone interview (1314 respondents)
- Alcohol consumption was assessed using a beverage-specific quantity-frequency measure based on reported alcohol consumption during the last 30 days: (i) 'During the last 30 days, on how many days did you drink beer / wine / alcopops / spirits?'; and (ii) 'On average, on a day when you drank beer (wine, alcopops, spirits), how many glasses of beer (wine, alcopops, spirits) did you drink?'

The average daily consumption (in grams of ethanol per day) was calculated by multiplying frequencies and quantities using beverage-specific standard ethanol contents of 4.8%, 11.0%, 5.5%, and 33.0% (by volume) for beer, wine, alcopops and spirits, respectively. Due to missing values, alcohol intake could be estimated for 7571 (96%) out of 7912 respondents.

- Data were provided by Alex Pabst, Fachbereich Epidemiologische Forschung (Epidemiological Research Department), IFT Institut für Therapieforschung, Munich.

#### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data was used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

### *Surveys not used*

Bundes-Gesundheitssurvey: Alkohol (BGS '98) conducted by the Robert Koch Institute (RKI)

- Representative sample of the resident population
- N=7124 individuals aged 18-79 years; Response rate=61.4%
- Survey data were collected by means of self-administered questionnaire, medical interview and physical examination.
- Data on alcohol consumption were obtained using a food frequency questionnaire. The English translation of the questionnaire ('German National Health Examination and Interview Survey 1998' Questionnaire, Robert Koch Institute, Berlin) was sent to us via personal communication with Dr Heribert Stolzenberg, at RKI. Survey questions relate to (approximate) frequency and then volume of alcohol intake – these information are then combined to give two drinking categories: >10g/day and >40g/day (by sex and age). Thus results presented in the specific categories required by DYNAMO-HIA could not be calculated.
- Not selected as the survey results were not available in the format required by DYNAMO-HIA.

#### Cross National Student Health Survey

- See comments under Bulgaria

#### DESG : German Health Interview & Examination Survey for Adults

- Survey is currently ongoing (2008-2011)

#### ECAS study – European Comparative Alcohol Study - 2000

- See comments under Finland

#### EPIC – European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In Germany, participants were selected from: Heidelberg and surroundings, and Potsdam and surroundings. Residents: men aged 40–65 years, women aged 35–65 years
- Not used as only limited areas were covered and limited age range.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

#### GEDA- Telephone Health Survey 2008/09 (Robert Koch Institute)

- Not selected as data are not yet available (as of March 2009)

#### Genacis GENACIS (Gender, Alcohol and Culture: An International Study) - 2000<sup>41</sup>

- National postal survey conducted in 2000
- N=8119 individuals aged 18-60 years; Response rate=51.4%
- Not selected as data are relatively old compared with the selected study.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

SHIP: The Study of Health in Pomerania (North-east Germany) (see [http://www.medizin.uni-greifswald.de/cm/fv/english/ship\\_en.html](http://www.medizin.uni-greifswald.de/cm/fv/english/ship_en.html))

- Data collected 1997-2001 via CAPI (computer –assisted personal interviews)
- Not used as only one region of Germany was covered

Survey on living conditions, health and the environment – 1998 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Conducted by the Federal Institute for Population studies using a combination of cross-sectional/panel design
- Sampling was based on the methods used in former health surveys for East and West Germany (DHP study). Non participation rate=42.9%
- Questions on alcohol consumption enquired about the average amount of wine, beer and spirits consumed daily and on whether alcohol consumption had changed.
- Not used as relatively old.

Telephone Health Survey 2002-2003, 2003-2004, 2004-2005 and 2005-2006<sup>108</sup>

- The Robert Koch Institute's Department of Epidemiology and Health Reporting has been conducting nationwide telephone health surveys since 2002 with the support of the Federal Ministry of Health. However, only the surveys from 2004 onwards included relevant questions on alcohol consumption (as per HIS/HES database search); only data from the first survey (2002-03) are available (and only in German).
- The fourth survey was conducted between October 2005 and March 2006. Respondents were all those who consented in the 2003 survey to be recalled (thus a longitudinal study design)
- N=5542 individuals; Response rate=57%
- In addition to the questions covered in previous surveys, the 2005-2006 survey also covered factors that contribute towards staying healthy
- Data were collected by computer-assisted telephone interview questionnaire
- Not selected as we could not obtain a response to our enquiries for assistance.

World Health Survey (WHO) 2003 – Report for Germany<sup>109</sup>

- Survey conducted in 2003
- N=1259 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Greece

### *Survey used*

Greek EPIC (European Prospective Investigation into Cancer and Nutrition Study) Cohort<sup>110</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)

- Individuals recruited from the general population from throughout Greece (covering all regions). All participants in the study were volunteers and represented all socio-economic levels of the society
- EPIC-Greece is a prospective cohort study, with baseline data collection during 1994-1999.
- Participants were actively recruited from the general population. That is, the actual study population is a sample of convenience of volunteers agreeing to participate, but not required to be random samples of defined populations.<sup>111</sup>
- Alcohol consumption data re available for 28,034 participants (11,558 men and 16,476 women); aged 20-86 years.
- The data on alcohol consumption were gathered by a validated food frequency questionnaire.<sup>112</sup>
- The questions for alcohol consumption in the questionnaire were the following: 1) Do you currently drink alcoholic beverages? (Yes/No) 2) Did you drink alcoholic beverages in the past? (Yes/No) 3) Approximately how much do you currently drink per week or per day?
- Possible answers: i) Not at all, ii) Less than 1 glass/week, iii) More than 1 glass/week, iv) Number of glasses/week (if consumption is more than one glass per week).
- Type of alcoholic beverage asked about: Wine, Beer, Vermouth/Martini, Liqueur, Whiskey, Gin/Vodka Brandy/Cognac, Ouzo, Other (specify)
- Trained interviewers administered the dietary and lifestyle questionnaire
- Standard portion sizes were used for the estimation of consumed quantities of alcoholic beverages in ml; ethanol intake in grams was calculated using a food composition database, based on MacCance and Widdowson's "The Composition of Foods" 5<sup>th</sup> edition, modified to accommodate the particularities of the Greek diet.<sup>113</sup> For each participant, intake of ethanol in grams per day was calculated and respondents categorised into the predefined DYNAMO alcohol consumption categories, by sex and age-group.
- Data were provided by: Benetou Vassiliki, Orfanos Philippos, Androniki Naska and Antonia Trichopoulou, WHO Collaborating Center for Nutrition and Hellenic Health Foundation, Athens, Greece. Contact details for the EPIC staff are available at: <http://epic.iarc.fr/centers/greece.php>

SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data was used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages

#### ***Surveys not used***

ATTICA study 2001-2002<sup>114</sup>

- N=3042 individuals: 1514 men aged 18–87 years and 1528 women aged 18–89 years; Response rate=75%
- Assessment of alcohol intake was done using a food-frequency questionnaire
- Not used as conducted only from the province of Attica

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

Greek National Population Survey on Licit and Illicit Substance Use, 1984, 1998, 2004

- National stratified probability sample of approximately 4000 participants aged 12-65 years; N=4297 in 1984, N=3759 in 1998, N=4781 in 2004
- Not used as includes only frequency of consumption measures (Personal communication: Anna Kokkevi from UOA, Greece)

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

National Survey: Psychosocial factors and health 2004

- Conducted by the University Mental Health Research Institute (<http://www.ektepn.gr>)
- The survey questions ask about the frequency of consuming alcohol, binge drinking, the circumstances in which respondents drink, drinking and concurrent drug-taking, reasons for drinking, and first age and frequency of ‘getting drunk’; but there are no survey questions about the amounts of alcohol consumed.
- No selected as does not include the information required for this project.

Population and Housing Census 2001

- National Census conducted on 18 March 2001 by the General Secretariat of the National Statistical Service (<http://www.statistics.gr>)
- Includes 66 questions but none on alcohol consumption
- No used as it does not include the information required for this project.

Survey of overweight in Greek adolescents<sup>115</sup>

- Representative sample of adolescents throughout the whole of Greece
- N=14,456 adolescents aged 13-19 years (6,677 boys and 7,779 girls)
- Not used as only limited age range and it is unclear how alcohol was assessed.

World Health Survey (WHO) 2003 – Report of Greece<sup>116</sup>

- N=1000 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Hungary**

### ***Surveys used***

- No survey data met the inclusion criteria.

### ***Surveys not used***

CINDI Health Monitor – Hungary 2001-2002<sup>49</sup>

- N=6000 aged 20-69 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic beverages during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.

- Not used as we did not get a response to our enquiries for assistance to two CINDI contacts at the Department of Public Health

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

#### GENACIS (Gender, Alcohol and Culture: An International Study) - 2001<sup>41</sup>

- National survey conducted in 2001
- N=2243 individuals aged 19-65 years
- Not used as we have received no response to our enquiries for assistance.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Health Behaviour Survey – 1994<sup>117</sup>

- Nationally representative sample of individuals aged 15-64 years
- Not used as does not appear to have questions related to alcohol (based on HES/HIS database - <https://hishes.iph.fgov.be/index.php?hishes=home>) and relatively old

#### National Health Interview Survey 2003, 2000 – Hungary (OLEF 2000 – see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Cross-sectional national health survey conducted by the National Centre for Epidemiology (<http://www.oek.hu/oek.web?to=939&nid=359&pid=1&lang=eng>)
- Individuals aged 18 years and over were selected (we were unable to find the sample size); Response rate=81% in 2003
- The 2003 survey examined the percentage of abstainers, the overall frequency of alcohol consumption during the previous 12 months, and alcohol intake during the previous 7 days.
- Not used as data appears not to be publicly accessible; we could not obtain a response to our enquiries to the survey contact person. We emailed the National Centre for Epidemiology to for data and information. However, we were told that the Institute is no longer responsible for the National Health Interview Survey and so is unable to provide the information required for the project.

#### National Health Survey – 2000

- Conducted by Magyar Gallup Intezet Budapest; Health Promotion Research Institute (EFKI) Health Statistics Unit.
- Random sample from National Ballot Registry
- N=5503 individuals aged 18-64 years
- Alcohol consumption results are grouped, by age and gender, into: abstinent (no alcohol at all); occasional (no alcohol in the past week, but has consumed prior); moderate (did drink alcohol past week but not heavy drinker); heavy (Women: >7drinks past week; Men: >14 drinks in the past week). So the categories provided are not appropriate to the DYNAMO-HIA project.

- Not used as we were unable to find the actual survey questions and have received an error message when we emailed the local Gallup organisation ([gallup@gallup.hu](mailto:gallup@gallup.hu)) to ask for the raw data.

Population and Housing Census–2001 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Census conducted by the Hungarian Central Statistic Office of all Hungarian citizens living in Hungary (>3 months)
- The questionnaire asked seven questions about alcohol use, including how much alcohol the respondent drank each day during the last week (in dL) (by age and sex).
- Not used as we were unable to find any health-related data on the Population Census 2001 website (<http://www.nepszamlalas.hu/eng/volumes/volumes.html>) and no response to our requests for the data

Study by Page et al.<sup>66</sup> of alcohol use and related social normative perceptions in Central and Eastern European adolescents

- See comment under Czech Republic

Way of Life and Time Use Survey – 2000 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as included only one general question about overall frequency of alcohol consumption and about the types of alcoholic drinks consumed.

World Health Survey (WHO) 2003 – Report of Hungary<sup>118</sup>

- N=1419 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Ireland**

### ***Surveys used***

Survey of Lifestyles, Attitudes and Nutrition in Ireland (SLAN) 2007 (also conducted in 1998, 2002)<sup>119</sup>

- Data from 2007 were used.
- National survey representative of general population of Ireland (when compared with Census 2006 figures) and weighted in the analysis to match Census data.
- N=10,364 respondents; Response rate = 62%.
- Data were collected by personal interviews. Questions covered the general frequency of alcohol consumption, number of standard drinks consumed on a typical day when alcohol is consumed, frequency of consumption of six or more drinks in one occasion, and number of standard drinks consumed during the previous 7 days.
- Two survey questions were used: (1) Question E1: How often do you have a drink containing alcohol? (Responses: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week); (2) Question E4: During the past 7 days how many standard drinks of any alcoholic beverage did you have each day? (Response: number of drinks consumed on each day from Monday to Sunday recorded)
- Data were provided by Karen Morgan, Mark Ward and Helen Burke from the Royal College of Surgeons in Ireland, on behalf of the SLAN 2007 Consortium.

### ***Surveys not used***

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

### Genacis GENACIS (Gender, Alcohol and Culture: An International Study) - 2002<sup>41</sup>

- National survey conducted in 2002
- N=1047 individuals aged 18 years and over; Response rate=70%
- Not used as small sample size.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

### Living in Ireland Survey –2000,2001 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Conducted by the Economic & Social Research Institute (<http://www.esri.ie/>)
- Does not appear to include questions on alcohol consumption (but we could not find the survey on the ESRI website)
- Not used as we did not obtain a response to our enquiries.

### Quarterly National Household Survey<sup>120</sup>

- Survey about employment, housing, demographic data, and selected social issues.
- Not used as it does not appear to include questions about alcohol consumption

### World Health Survey (WHO) 2003 – Report for Ireland<sup>121</sup>

- N=1014 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Italy

### *Surveys used*

Everyday Life in 2007 Multipurpose Survey on Households “Everyday Life Aspects”. Year 2007 (also conducted yearly between 1993-2003, and in 2005-2006)<sup>122</sup>

- Conducted by National Institute of Statistics (ISTAT) (<http://www.istat.it>), including a sample of households (all individuals in the selected households are included in the survey (no age restriction)).
- In 2007: N=19,170 households, 48,253 individuals (aged 0+); response-rate 81.9%.
- Complex sample design: double level sample design with stratification of the primary units. The primary units were the municipality and the secondary units were the vital statistical families. Data were obtained on each member of the family included in the sample. The municipalities were selected with probability proportional to demographical size and without repetition; meanwhile the families were selected with equal probability strategy and without repetition.
- Alcohol consumption was investigated only among subjects aged 11 years and over (43,434 individuals).

- Data were collected using face-to-face interview at the participants' homes, and using self-administered questionnaires.
- Questions on alcohol consumption enquired whether any alcohol was consumed during the past 12 months, whether alcohol is consumed between meals, and the usual frequency/amounts consumed of wine, beer and spirits.
- Results provided by Silvia Ghirini and Emanuele Scafato at the Centro Nazionale di Epidemiologia, Sorveglianza e Promozione della Salute (National Health Institute - <http://www.epicentro.iss.it/default.asp>)

#### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

#### *Surveys not used*

##### CINDI Health Monitor – 2001-2002<sup>49</sup>

- N=3491, age group 20-64 years or 25-64 years; selected from six areas
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages that were consumed during the previous seven days.
- The CINDI contact at the Department of Preventive Medicine provided some information about the survey in the form of a PowerPoint presentation; but there was no response to our request for the dataset.
- Not selected as we could not obtain data from the survey.

##### ECAS study – European Comparative Alcohol Study - 2000

- See comments under Finland

##### EPIC - European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In Italy, participants were from: Ragusa/province, Florence/province, Turin/province, Varese/province.
  - Ragusa province: Local blood donors association, population-based recruitment in four towns (Monterosso, Giarratana, Ispica and Chiaramonte), local teachers union, and other sources. Residents: men aged 40–65, women aged 35–65
  - Florence province Breast cancer screening participants (CSPO), men and women from the general population. Residents: men aged 35–64, women aged 35–64, without prevalent cancer
  - Turin: city Blood donors, employees, volunteers, medical test users at national health service. Residents: men aged 40–74, women aged 35–74, without prevalent cancer
  - Varese province: Volunteers from resident general population, mostly an extension of an ongoing study (ORDET)

- Not used as conducted only in selected areas, with very specific groups of participants, some with limited age groups.

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

Genacis GENACIS (Gender, Alcohol and Culture: An International Study) – 2001-2002<sup>41</sup>

- Survey conducted in 2001-2002 in Tuscany
- N=3275 individuals aged 18 years and over; Response rate=61%
- Not used as covered only one region of Italy.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Health Conditions & Use of Health Services (Condizioni di Salute e Ricorso ai Servizi Sanitari) 1999 and 2004-2005 – Conducted by ISTAT

- National survey using a multi-stage probability sample of households and the inclusion of all individuals in the selected households
- In 2004-2005: N=51,094 households and 130,774 individuals of all ages; Non-participation rate=16.1% at the household level, and 0% at the individual level.
- Not selected as it does not include questions about alcohol consumption (as per personal correspondence with Gabriella Sebastini and Lidia Gargiulo from ISTAT).

‘L’uso e l’abuso de alcohol in Italia’ – reports for the years 2005, 2006, 2007 and 2008<sup>123,124,125,126</sup>

- The reports present various statistics on alcohol consumption in Italy by age, gender, region and education, including the frequency of alcohol consumption.
- Not selected as the information provided is not in the format required for this project, and because the data sources are unclear (reports in Italian), most probably the “Aspetti della vita quotidiana” surveys mentioned above.

‘Regional dataset on health’ (part of the ‘Health for All-Italia’ database)<sup>127</sup>

- Chapter 4 (Lifestyles) provides tables on various alcohol consumption statistics by gender, sex and sub-regions of Italy, including: the proportion of never drinkers, proportion of respondents drinking (at all, weekly, ½ litre per day) wine or beer, proportion of respondents drinking alcohol between meals, proportion drinking more than once a week
- The sources of the data are not clear and are probably from a combination of sources<sup>128</sup> (possibly eight different sources)
- Not used as we did not obtain a response to our application for the Microdata.

World Health Survey (WHO) 2003 – Report for 2003<sup>129</sup>

- Survey conducted in 2003
- N=1000 households and 997 individuals

- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Latvia

### *Surveys used*

Health Behaviour Survey of Latvian Adult Population – 2006<sup>130</sup>, every two years from 1998 to 2008. (Combined data files from: 1998. 2000. 2002. 2004. 2006. 2008 were used)

- Conducted by the National Public Health Institute and used to provide “FINBALT” data (<http://www.ktl.fi/eteo/finbalt>)
- Simple random samples of the national Latvian population aged 15-64 years.
- Data were collected by self-administered mailed questionnaires.
- The methodology was very similar for the six surveys from 1998-2008 and the questions about alcohol (beer, wine, strong alcohol and long drinks) consumption during the past week were not changed since the 1998 survey. Therefore, after discussion with our Latvian contacts, we elected to use the combined dataset. Sample sizes and response rates for each survey are given in the data spreadsheet. Total sample size: 10, 265. Response rates ranged from 52.2% (2008) to 80% (2000).
- The (latest) Survey Report 2008 has not been published yet; it is expected in November 2009.
- Data were provided by Biruta Velika (colleague of Iveta Pudule) of the Centre of Health Economics, Riga.

### *Surveys not used*

Baltic Nutrition Survey – 1997<sup>80</sup>

- N=2258 individuals aged 19 to 64 years
- Estimated alcohol intake based on reported intakes during the previous 7 days
- Not used as relatively old compared with the study selected (see above)

CINDI Health Monitor – 2002<sup>49</sup>

- N=3000 individuals aged 15-64 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- The contact person for this survey is Iveta Pudule (Centre of Health Economics, Riga). After discussion with her and with Biruta Velika, we elected to use data from the *Health Behaviour Survey of the Latvian Adult Population* survey (see above), as this survey has (overall) a larger sample size and is more recent than the CINDI survey.

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Health Interview Survey (also called: Health survey results of Latvian population in 2003<sup>131</sup>) 2003 (2008 results will not be available before the end of 2009)

- Conducted by the Ministry of Social Security and Labour; and Central Statistical Bureau of Latvia (<http://www.csb.gov.lv/csp/content/?lng=en&cat=1444> )
- Multistage probability sample of individuals selected using the population register (with potential replacement at the household level)
- N=6837 individuals aged 15-74 years
- Includes questions about alcohol consumption during the past 7 days and frequency of consumption during the past 30 days; but we were unable to find further information about the survey (nor data) on the website.
- The Health Statistic Section has provided us with alcohol consumption tables and the Summary Report for the 2003 Survey; however the tables are not in the format required for this project and we could not get access to the data. No response to our further enquiries.
- Not used as we were unable to obtain access to the data.

Living Conditions Survey – 1999 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Multistage probability sample of individuals; Non-participation rate=21%
- Questions related to alcohol enquired about the time since alcohol was last consumed, the number of days alcohol was consumed during the previous week, and the number of units of alcohol that were consumed the last time alcohol was consumed
- Not used as relatively old data and the questions included in the survey cannot provide the estimates required.

Norbalt I (1994) and II (1999)<sup>83</sup>

- Conducted simultaneously in Estonia, Latvia and Lithuania
- Latvia: 1994: n=3500 households, 1999: n=3500 households, age: 18 years and over
- In 1994 the question regarded how many units of beer, wine and spirits the respondent had had on average on the days he or she had consumed alcohol in the past two weeks. In 1999, the respondents were asked specifically about how much they had consumed of the same categories as above on the last occasion they had consumed alcohol.
- 1994 data would offer better estimates of usual intake but relatively old data.

Study by Reitan<sup>84</sup> – Surveys conducted in 2001 in Estonia, Latvia, Lithuania, Poland

- See comments under Estonia

World Health Survey (WHO) 2003 – Report for Latvia<sup>132</sup>

- N=929 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice, as estimates of alcohol consumption are based on the recall of alcohol consumption during the last 7 days (which tends to underestimate alcohol intake).

## Lithuania

### *Surveys used*

No survey data met the inclusion criteria.

### *Surveys not used*

Baltic Nutrition Survey 1997<sup>80</sup>

- N=2139 individuals aged 19 to 64 years
- Not used as relatively old

CINDI Health Monitor – 2002<sup>49</sup>

- N=3000 individuals aged 20-64 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as we could not obtain sufficient information following our enquiries.

Cross National Student Health Survey

- See comments under Bulgaria

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

Lithuanian Health Behaviour Monitoring/ Health Behaviour among the Lithuanian Population – 2002, 2004, 2006<sup>133</sup> (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Conducted by the Lithuanian Institute for Biomedical Research, Kaunas University of Medicine ([http://www.kmu.lt/?set\\_lang=en](http://www.kmu.lt/?set_lang=en))
- This survey is also used for the FINBALT Health Monitoring (conducted in Estonia, Latvia, Finland and Lithuania- which joined in 1994; data on alcohol in Lithuania since 1996).
- Includes a national random sample from the National Population Register of Lithuanian inhabitants aged 20-64 years.
- Selected sample: N=3000; eligible sample: N=2940; final sample: N=1,739; Response rate=40.8%.
- Data were collected by self-administered (postal) questionnaires
- Weekly alcohol consumption was measured with the following question: 'How many glasses (regular restaurant portions) or bottles of the following drinks have you consumed during the last week (7 days)? If you have not had any, mark 0, i. medium strong or strong beer \_\_ bottles, ii. free-mixed highballs \_\_ bottles, iii. strong alcohol, spirits \_\_ restaurant portions (4 cl.), iv. wine or equivalent \_\_ glasses.
- In Lithuania, the consumption of 'free-mixed highballs' was not asked.
- Empty responses were included in the "0" consumption category. The distribution of weekly alcohol consumption tends to be skewed to the right, indicating that the proportion of non-drinkers and moderate drinkers is substantial (as with other methods using estimates based on last 7 days).

- Not used as we could not obtain sufficient information following our enquiries.

#### Health Survey of Lithuanian Population – 2005<sup>134</sup>

- Conducted in September-October 2005 by the Department of Statistics of the Government of the Republic of Lithuania (Statistics Lithuania)
- Sample selected using a probabilistic sampling method
- N=8996 Lithuanian residents aged 15 years and over; Response rate=81.8%
- Data were collected using face-to-face interviews
- Included questions about alcohol consumption during the past 12 months (frequency, average amounts consumed). The report contains graphical presentation of consumption during the past 12 months (yes/no), frequency, type of alcohol consumed, etc, but not consumption by category as required by HIA-DYANMO.
- After contacting the Deputy Head of the Social protection and health statistics division at Statistics Lithuania, we were told that it would not be possible to obtain re-analysed data due to the personnel costs involved. The primary data could be provided to us but only on the basis of official written agreement between the two institutions, which would entail a (likely lengthy) process of authorization, and bilateral agreement of the scope and content of the data; and this would also be subject to a fee.
- Not used due to the administrative difficulties involved with obtaining access to the data.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Living Conditions Survey – 1999 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Multistage probability sample of households, with one household member (18 years and over) being selected for the survey; Non-participation rate=12%
- The survey asked about when alcohol was last consumed, the number of days when alcohol was drunk during the previous two weeks, and the number of units of alcohol were consumed the last time alcohol was consumed.
- Not used as relatively old data and the questions related to alcohol were not sufficiently precise.

#### Norbalt I (1994) and II (1999)<sup>83</sup>

- Surveys conducted simultaneously in Estonia, Latvia and Lithuania
- Lithuania: 1994: N=2700 households, 1999: N=3159 households, age: 18 years and over
- In 1994 the questions enquired about how many units of beer, wine and spirits the respondent had had on average on the days he or she had consumed alcohol in the past two weeks. In 1999, the respondents were asked specifically about how much they had consumed of the same categories as above on the last occasion they had consumed alcohol.
- 1994 data would offer better estimates of usual intake but relatively old data thus data not used.

#### Study by Reitan<sup>84</sup> – Surveys conducted in 2001 in Estonia, Latvia, Lithuania, Poland

- See comments under Estonia.

## Luxembourg

### *Surveys used*

- No survey data met the inclusion criteria.

### *Surveys not used*

#### ORISCAV-LUX – 2007-2008<sup>135</sup>

- National study to monitor potentially modifiable cardiovascular risk factors in the adult population.
- N=4283 individuals aged 18-69 years
- Alcohol intake estimated using the AUDIT questionnaire as well as a food frequency questionnaire
- Data collection completed as of January 2009 but published data were not available at the time of data collection
- Initial response from contact person at the “Centre de Recherche Publique – Santé” in Luxembourg; but then no data/further assistance obtained
- Not used as we could obtain results from the survey.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### World Health Survey (WHO) 2003 – Report of Luxembourg<sup>136</sup>

- Individuals aged 18 years and over, n=700
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Malta

### *Surveys used*

#### European Health Interview Survey 2008<sup>137</sup>

- Conducted by the Department of Health Information and Research, Malta (<http://www.sahha.gov.mt/pages.aspx?page=383#Introduction>) between June and August 2008 on a randomly selected sample of individuals drawn from a population register provided by the National Statistics Office and stratified by age, gender and locality.
- N=5500 individuals aged 15 years and over who were residing in the Maltese Islands; Response rate=72%
- Data were collected via two questionnaires (available in the Maltese and English language). The first longer questionnaire was completed during a face-to-face interview and the second, shorter questionnaire, containing more sensitive topics, was filled in by the interviewee. The questions on alcohol were in the self-completed form and the relevant questions used for the DYNAMO-HIA analysis were: whether or not

the respondent had consumed alcohol in the past 12 months; and the amount of alcohol consumed in a typical week.

- Data were provided by Dorothy Gauci, Research Officer, Department of Health Information and Research

### *Surveys not used*

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD):

- See comments under Austria

First National Health Interview Survey 2002  
(<http://www.sahha.gov.mt/pages.aspx?page=383#Introduction>) – within this was the CINDI Health Monitor – 2002<sup>49</sup>

- Multi-stage probability sample of individuals aged 16 years and over with 20% non-participation
- N=5510 individuals aged 16 years and over
- Not used as questions on alcohol asked about consumption in the last 7 days (which tends to underestimate alcohol intake). The other questions based on frequency do not allow for the calculation of volumes.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Lifestyle Survey 2003<sup>138</sup>

- Survey conducted by the National Statistics Office (NSO) of Malta
- Random sample of 1000 individuals from the Electoral Register; 528 completed the questionnaire; Response rate=52.8%
- Data collected by self-completed questionnaires
- Questions related to alcohol asked about the number of drinks per week (Personal communication: Margaret Bugejal, from National Statistics Office (NSO) – Malta)
- Not selected as small sample size, relatively low response rate and lack of precision in the estimation of alcohol intake.

## **Netherlands**

### *Surveys used*

Continuous quality of life survey/ Dutch Permanent Life Situation Survey (POLS) – Health Interview Surveys: 1998, 2001, 2002, 2003, 2004, 2005, 2006, 2007

- Estimates used are for the years 2005, 2006 and 2007
- In 2005: N=10,378, Response rate 65%; In 2006: N=9706, Response rate=66%; In 2007: N=8738, Response rate=64%
- Includes representative (randomly selected from population registries) samples of the Dutch population of all ages, but excludes institutionalised individuals (residents of

homes and institutions) and the so-called 'sailing and driving' population; thus excluding nearly 2 %.

- For most of the questions the information was collected by means of Computer Assisted Personal Interviewing (CAPI). However some items were collected by paper and pencil (PAPI) (questionnaires). The questions of alcohol intake are part of the paper and pencil section.
- There were nine separate questions in relation to alcohol consumption (Q's 24-32). They related to: the type of alcohol consumed, the frequency of consumption (past 6 months), and quantity-frequency questions for 'weekly' days (Monday-Thursday) and weekend days (Friday-Sunday).
- Questions Q24, Q27, Q28, Q29, Q30, Q31, and Q32 were used to calculate the number of glasses consumed alcohol per person per day; this information was then converted into grams of alcohol consumed per day with the following conversion factor, i.e. 1 unit of alcoholic beverage=12 grams of alcohol.
- Data were provided for the years 2005-07 by Frans Frenken and Jan-Willem Bruggink at Statistics Netherlands.

SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

#### *Surveys not used*

National (drug use) Prevalence Survey 2001 (NPO 2001)<sup>139</sup>

- National population survey conducted by CEDRO
- Measures the use of licit and illicit drugs and is thus including alcohol
- N=17,655 individuals aged 12 years and over in the Netherlands
- Asked information on the number of days the respondent drank during the previous month, and the approximate number of drinks consumed on those days.
- Not used as relevant data not available on the website and CEDRO was discontinued in 2004; no successful contacts with the authors could be made.

EPIC - European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In the Netherlands, participants were recruited in Bilthoven (3 cities) and Utrecht
- Bilthoven: Amsterdam, Doetinchem and Maastricht (three cities) Population-based age- and sex-stratified samples of the general population. Residents: men and women aged 20-60 in Amsterdam and Maastricht, and aged 20-65 in Doetinchem
- Utrecht: district Population-based breast cancer screening participants
- Not used as relatively old and only in selected cities.

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

Food Consumption Survey 2003 (RIVM)<sup>140</sup>

- Includes 750 Dutch young adults aged 19-30 years
- Data collected using two independent computerised 24-hour recalls administered by telephone and with a self-completed questionnaire
- Not used as small sample size and limited age range

GENACIS (Gender, Alcohol and Culture: An International Study) - 1999<sup>41</sup>

- Survey conducted in the region of Limburg only
- N=4222 individuals aged 16-69 years; Response rate=71%
- Not used as conducted in only one region and data relatively old

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Rotterdam study – data for 1980/1981 and 1994<sup>141</sup>

- N=2150 individuals aged 16-69 years in 1980/1981; N=3537 respondents aged 16-69 years in 1994
- Alcohol was estimated using a quantity-frequency-variability method
- Not used as conducted only in the city of Rotterdam and data relatively old

World Health Survey (WHO) 2004 – Report of Netherlands<sup>142</sup>

- N=1091 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Poland

### *Survey used:*

National Multicenter Health Survey (WOBASZ)<sup>143</sup>

- Conducted in 2003-2005
- Representative random sample of Polish inhabitants aged 20-74 years. A random selection process was used, stratified according to province and commune type. In each of the communities and in each major city, the personal identification numbers of 100 males and 100 females were randomly selected from the database.
- N=13,454; Response rate=74,3% of men and 79,3 % women
- Data were collected by face-to-face interview
- A series of questions on alcohol consumption were included in the survey: quantity/frequency questions based on usual consumption of: (1) Vodka or other high percentage alcohol drinks; (2) Wine; (3) Beer. Answers for the different types of beverages were combined to calculate DYNAMO-HIA data.
- Data were provided by Professors Wojciech Drygas and Jacek Koziarek, National Institute of Cardiology, Warsaw.

SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic

- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

### *Surveys not used*

Campaign called “We are fighting obesity” organised by the Hand-Prod company in the years 2000–2002<sup>144</sup>

- 10,254 women volunteers aged 25–95 years, recruited throughout Poland
- Alcohol questions covered the types of alcoholic beverages consumed (beer, wine or spirits) and the frequency of consumption
- Not used because the sample may not be representative as participants were volunteers, and because it includes only women.

CINDI Health Monitor – 2001-2002<sup>49</sup>

- N=5000 individuals aged 18-64 years; Response rate approximately 50%
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as the contact person for the CINDI Survey - Professor. Drygas, (Director, CINDI WHO Poland Programme, Department of Preventive Medicine), suggested that the WOBASZ Survey data would be superior due to its larger sample size and higher response rate.

Cross National Student Health Survey

- See comments under Bulgaria

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD):

- See comments under Austria

Health Population Status in Poland (Health Interview Survey) 2004 (also in 1996) (see <https://hishes.ipf.gov.be/index.php?hishes=home>)

- 14600 households and 43000 individuals of all ages; non-participation rate: 30% at the household level
- Enquired only about the general frequency of alcohol consumption during the previous 12 months and on the usual amount drunk in a single occasion; it is thus difficult to assess daily intake.
- Not used as limited information on alcohol consumption.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

INTERSALT Study – 1986-1987<sup>145</sup>.

- Performed in 52 centres and 32 countries on 9681 people aged 20-59 years old

- Not selected as data are relatively old

Study by Bobak et al 2004<sup>63</sup> looking at drinking patterns in one Czech, one Polish and one Russian city

- See comments under Czech Republic

Study by Manwell et al<sup>146</sup> in 1998-1999

- N=4373 adults aged between 18 and 80 years from twenty primary care clinics
- Includes questions on whether any alcohol was used during the past three months, including the quantity and frequency of beer, wine, and liquor consumed per week; the average number of days per week the beverage was consumed and the number of glasses, bottles, or cans consumed on one day.
- Not selected as only from selected health care clinics, thus not a representative sample of the population.

Study by Reitan<sup>84</sup> – Surveys conducted in 2001 in Estonia, Latvia, Lithuania, Poland

- See comments under Estonia.

Survey of The States Agency for Prevention of Alcohol Related Problems, entitled “Psychoactive agents – attitudes and behaviours” - 2002<sup>147,148</sup> (also in 1992, 1995 and 1998)

- Data were provided by W. Zatonski, Cancer Epidemiology and Prevention Division, The Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Warsaw
- Random sample of the Polish population aged 16 years and over; the response rate was 62% with large regional variations; (for example: 48% in highly urbanised regions).
- 6340 questionnaires were field in. Sample size after weighting=3148. Sample size after weighting for which alcohol consumption was estimated=2670 (478 had no data on alcohol).
- Data provided to us were adjusted to real consumption in 2002, using an estimated per capita intake at 9.5 litres per person per year.
- Not used as WOBASZ Survey were used in preference to this data due to the higher sample size and response rate

## **Portugal**

### ***Surveys used***

- No survey data met the inclusion criteria.

### ***Surveys not used***

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

Fourth National Health Survey 2005-2006<sup>149</sup>

- Multistage probability sample of households.
- N=15,239 households; Response rate=76%
- Data were collected by face-to-face interviews at the participants’ homes.

- Alcohol intake was assessed based on the average number and volume of drinks (for each one of the main types of beverages - wine, beer, liquors, whisky, vodka) during the previous 7 days. Visual aids were used for the type and volume of glasses.
- Data were provided by Carlos Matias Dias at the Department of Epidemiology, National Institute of Health, Lisboa. However, data were not used as there were inconsistencies observed in the number of respondents in the data sent. We could not obtain revised estimates in time for this report.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### CINDI Health Monitor Portugal

- Questions on alcohol in CINDI Health Monitor surveys ask about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as we have not been able to obtain information from the suggested contact person for the survey<sup>49</sup>

National Health Interview Survey (Inquérito Nacional de Saúde) 1999 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Conducted in 1998-1999 by the National Institute of Health Ricardo Jorge
- Not used as relatively old data and the contact person for this survey (Carlos Dias) suggested that the more recent Fourth National Health Survey would be a superior source of information.

#### Population and Housing Census 2001<sup>150</sup>

- Report available only in Portuguese.
- Not used as, per response from the Instituto Nacional de Estatística ([info@ine.pt](mailto:info@ine.pt), [eduarda.martins@ine.pt](mailto:eduarda.martins@ine.pt)), the survey does not include questions about alcohol consumption.

#### World Health Survey (WHO) 2003 – Report of Portugal<sup>151</sup>

- N=1030 households, 1030 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Romania

### *Surveys used*

- No survey data met the inclusion criteria.

### *Surveys not used*

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Health Interview Survey 2000 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Conducted by the National Institute of Statistics of Romania (information gathered from <https://hishes.iph.fgov.be/index.php?hishes=home>)
- Sample size unknown; 92% household participation rate
- Data were collected by face-to-face interviews
- Questions about alcohol consumption included whether the respondent consumed any alcohol in the past six months; the usual frequency of consumption; quantity (mL) of alcohol (beer, wine, spirits) consumed in the past week
- Not selected as no response were obtained to our enquiries.

Study by Page et al.<sup>66</sup> of alcohol use and related social normative perceptions in Central and Eastern European adolescents

- See comments under Czech Republic

### **Slovakia**

#### *Surveys used*

- No survey data met the inclusion criteria.

#### *Surveys not used*

##### CINDI Health Monitor 2002<sup>49</sup>

- N=3000 individuals aged 25-64 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as we were unable to obtain a response to our enquiries.

##### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

##### European Health Interview Survey 2007 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as we were unable to contact someone to obtain detailed information about the project. There were barely any information about the survey in the HIS/HES database at the time of data collection for this project.

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Multi-Country Survey Study on Health and Health System Responsiveness 2000-2001

- N=1086 individuals aged 18 years and over; Response rate=84%
- Data collected through personal interview
- Questions on alcohol include whether the respondent ever drank alcohol, frequency of alcohol consumption during the previous 12 months (monthly or less, weekly, daily), and the number of standard drinks consumed on a typical day when alcohol is consumed.
- Not used as relatively small sample size and questions do not allow for a precise estimation of usual alcohol consumption

Study by Page et al.<sup>66</sup> of alcohol use and related social normative perceptions in Central and Eastern European adolescents

- See comments under Czech Republic

World Health Survey (WHO) 2003 – Report of Slovakia<sup>152</sup>

- N=1752 individuals aged 18 years and over
- Not selected as not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **Slovenia**

### ***Surveys used***

- No survey data met the inclusion criteria

### ***Surveys not used***

CINDI Health Monitor 2001<sup>49</sup>

- N=3000 individuals aged 12-64 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- The published report<sup>153</sup> provides only summary statistics which are not in the appropriate categories for DYNAMO-HIA (simply frequencies and quantities as asked in the questionnaire).
- Not used as we could not obtain answers to our enquiries, i.e. we were unable to obtain the actual dataset or to get data that were reanalysed for us.

Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Slovene Public Opinion Surveys

- 1994/1 - Attitudes toward Health, Development Values and Environment
- 1996/2 - Attitudes toward Health, Sport Activities and Comparative Study of Electoral Systems
- 1999/2 - Attitudes toward Health and Health Service III and International Level of Living Survey
- 2001/3 - Survey about health and health service IV and Survey about defence and security
- Not used as we have not been able to obtain data on alcohol consumption from these studies.

#### Risk Factors for Non-communicable Diseases in Adults in Slovenia - 2001<sup>154</sup>

- Cross-sectional survey conducted in 2001 as part of a wider international project in the frame of the Countrywide Integrated Non-communicable Diseases Intervention (CINDI) program
- A stratified random sample of individuals aged 25-64 years was drawn from the Central Population Registry of the Republic of Slovenia; sampling was performed by the Statistical Office of the Republic of Slovenia.
- N=9043 questionnaires were eligible for analysis; Response rate to the mailed questionnaire was almost 64%.
- Data on alcohol were collected by a self-administered mailed questionnaire and enquired about the frequency of wine, beer and strong spirits consumption during the past year (never, a few times a year, once a month, 2-3 times a month, 1-2 times a week, 3-6 times a week, daily), and about the number of glasses of each of these beverages usually consumed on the days the respondent drinks alcohol. This was used to derive daily alcohol consumption. Participants were categorised as abstinent, moderate drinkers (0-10g/day for women and 0-20g/day for men) and heavy drinkers (>10g/day for women and >20g/day for men).
- Not used as published results are not presented in the format required for DYNAMO-HIA and we have not been able to receive the original dataset or to have data reanalysed for us.

#### World Health Survey (WHO) 2000 – Report of Slovenia<sup>155</sup>

- N=687 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## Spain

### *Surveys used*

Encuesta Nacional de Salud (Spanish National Health Survey: SNHS) 2006<sup>156157</sup> (also in 1995, 2001, 2003)

- National survey conducted by the Spanish Ministry of Health and Consumption and the National Statistics Institute (INS - Instituto Nacionalde Estadistica), with data collection between June 2006-June 2007
- A stratified tri-stage sample type was used. The first-stage units were the census sections and the second-stage units the main family dwellings. One adult (aged 16 and over) was selected within each household to fill out the “Adults Questionnaire” and, should there be any minors (aged 0 through 15), a minor was also selected to fill out the “Minors Questionnaire”.
- Sample: approximately 31,300 households distributed among 2,236 census sections. Final sample size: (adults aged 16years+) 29,478 interviews. Note: ‘replacement’ respondents were also used. Response rate: 96%.
- Survey consists of three questionnaires: A Household Questionnaire, an Adults Questionnaire and a Minors Questionnaire. Information was collected by direct personal interview with persons aged 16 and over, and along with the mother or father in the case of persons aged under 16.
- Quantity-frequency questions asking about usual consumption for each of wine, beer, appetizer, cider, liquor and whisky.
- The SNHS dataset and related information were obtained from Esteve Fernandez Munoz of the Institut Catala d’Oncologia/IDIBELL (Spain), also a DYNAMO-HIA partner. They were re-analysed by the WP8 DYNAMO-HIA team using Stata 11.0 statistical software (StataCorp LP, College Station, USA). For each type of alcoholic beverage, information on the reported frequencies of consumption and usual quantities consumed (in numbers of glasses) were combined. Daily alcohol intake was then derived, assuming 12 grams or pure alcohol per glass, and summing across all types of beverages. Prevalence rates according to the DYNAMO-HIA categories were then obtained by age-group and sex.

SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

### *Surveys not used*

CINDI Health Monitor<sup>49</sup>

- Survey conducted in Catalonia
- N=1700 individuals aged 24 years and over
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as conducted only in one region of Spain

#### Cross National Student Health Survey

- See comments under Bulgaria

#### EPIC - European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20+ (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In Spain, different provinces/regions were selected.
  - Granada: province Blood donors, general population (recruited through census, health centres). Residents: men aged 40–64, women aged 35–64 years
  - Murcia: region Blood donors and their partners (67% of cohort), general population of two towns (23%), civil servants (5%), employees of two companies (3%), participants in a cardiovascular risk study (2%). Residents: men aged 40–65 years, women aged 35–65 years
  - Navarra: Pamplona city and Navarra region: Blood donors, general population. Residents: men aged 40–65 years, women aged 35–65 years
  - San Sebastian: city and Gipuzkoa province: Blood donors, employees of selected enterprises (recruited through census of selected municipalities). Residents: men aged 40–65 years, women aged 35–65 years
  - Asturias: region Blood donors, regional civil servants: Men aged 40–64 years, women aged 35–64 years and general population
- Not selected as only selected sub-regions of Spain, selected age groups and in some cases selected groups of individuals.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### GENACIS (Gender, Alcohol and Culture: an International Study) - 2002<sup>41</sup>

- Regional survey conducted in 2002 in Galicia, Valencia and Cantabria
- N=1850 individuals aged 18 years and over
- Not used as conducted only in three regions of Spain.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

Impairments, Disabilities and Health Status Survey 1999 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as relatively old survey compared with the selected source of data.

SIVFRENT – Sistema de Vigilancia de Factores de Riesgo asociados a Enfermedades No Transmisibles<sup>158</sup>

- Monitoring system which started in 1995 to assess the distribution and trend in the prevalence of key risk factors in the city of Madrid
- Not selected as surveys are only conducted in Madrid

### World Health Survey (WHO) 2003 – Report of Spain<sup>159</sup>

- N=6373 individuals aged 18 years and over
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

### Sweden

#### *Surveys used*

#### Alcohol Monitoring Studies – The Monitoring Study 2002<sup>160,161</sup>

- Taken from a national alcohol survey conducted by Temo AB (now Synnovate) and commissioned by SoRAD (Centre for Social Research on Alcohol & Drugs, Stockholm University). Additional information about the survey were provided by personal correspondence with Professor Haken Leifman, and Mats Ramstedt at SoRAD.
- Used Temo AB's comprehensive register of household telephone numbers with compensation for secret (silent) numbers. Respondents were selected by random telephone dialling (30 contact attempts were made before an individual was recorded as non-response).
- N=1500 adults aged 16-80 years were interviewed monthly; Response rate=55-60% (personal communication Professor Leifman). Non-response rate varied between 40-50% during the study period.
- Interviews were conducted by telephone and covered the quantity of spirits, beer and wine consumed during the past 30 days (Quantity and Frequency scale). Interviews were conducted monthly; each month a new sample was collected.

#### SHARE 2006-2007: Study of Health, Aging, and Retirement in Europe<sup>60</sup>

- See comments under Czech Republic
- SHARE data were used to assess trends in intakes in the elderly and to adjust prevalence estimates in the older ages.

#### *Surveys not used*

#### ECAS study – European Comparative Alcohol Study - 2000

- See comments under Finland

#### EPIC - European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway) among individuals aged 20+ years (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In Sweden: 2 different areas only:
  - Malmö city: population-based residents: men aged 50–72, women aged 46–72
  - Umeå: the Vasterbotten county: population-based residents: men and women aged 30 40, 50 or 60 years.
- Not selected as only small defined areas and limited age range.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

European School Survey Project on Alcohol and other Drugs (ESPAD):

- See comments under Austria

GENACIS (Gender, Alcohol and Culture: An International Study) 2002<sup>41</sup>

- National survey conducted in 2002
- N=1193 individuals aged 17 years and over; Response rate=67.8%
- Not used as relatively small sample size.

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

National Public Health Survey: ‘Health on Equal Terms’<sup>162</sup>

- Survey conducted annually since 2004 by the Swedish National Institute of Public Health
- In 2006 (most recent data – available on website): 56889 individuals aged 16-84 years were surveyed; Response rate=61%
- Data were collected using a self-administered postal questionnaire
- The questionnaire asked only four questions about alcohol consumption, including three AUDIT questions, thus providing insufficient information to be able to calculate average daily consumption
- Not selected as it is not possible to obtain the estimates required.

‘Use of alcohol and tobacco’ report<sup>163</sup>

- Based on results from the 2003/2004/2005 ‘Survey of Living Conditions’ (ULF), an annual survey conducted by Statistics Sweden.
- The sample size was roughly 7500 individuals aged 16 years and over each year.
- Used consumption categories different from those required by DYNAMO-HIA (No consumption/ low or no consumption/ high consumption/ intense consumption). In 2003: one question (#36) about alcohol consumption: asked about: i) frequency of alcohol consumption during the past 12 months; ii) amount drunk on each occasion. This would require the re-analysis of the dataset to obtain results in the required consumption categories.
- Not used as we did not obtain a reply to our requests of assistance.

World Health Survey (WHO) 2003 – Report of Sweden<sup>164</sup>

- N=1000 households, 1000 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

## **United Kingdom**

### *Surveys used*

General Household Survey (GHS)<sup>165</sup> - 2006<sup>166,167</sup>

- Multi-purpose continuous survey carried out by the Office of National Statistics (UK). Information is collected on a range of topics from people living in private households in Great Britain. The survey has run continuously since 1971, except for breaks in 1997-1978 (when the survey was reviewed) and 1999-2000 when the survey was re-developed.
- Probability, stratified, two-stage sample design. Primary sampling units (PSU's): postcode sectors; Secondary sampling units (SSU's): addresses within those sectors.
- N=9,731 households and 22,924 individuals of all ages; Overall response rate=76%.
- There were two measures of alcohol consumption in the survey: (1) Average weekly alcohol consumption; and (2) Maximum amount drunk on any one day in the previous 7 days. The first measure was used to obtain DYNAMO-HIA estimates. Respondents were asked how often in the previous 12 months they had drunk: normal strength beer, strong beer (6% or greater), wine, spirits, fortified wines and alcopops. This information was combined with the reported number of units of each type of beverages consumed on a usual drinking day to obtain the average weekly alcohol consumption<sup>168</sup>. Respondents aged 16-17 years used a self-completed questionnaire to complete the alcohol consumption questions.
- Data were converted into grams of pure alcohol per day by the DYNAMO-HIA team, assuming 12 grams of pure alcohol per unit. Respondents were then re-distributed according to the DYNAMO alcohol consumption categories, and by sex and age-group.

#### *Surveys not used*

'Alcohol-attributable fractions for England'<sup>169</sup> – Report by the North West Public Health Observatory, 2008

- Alcohol estimates in the report were based on the 2005 General Household Survey
- Not selected as estimates of intakes are not in the format required and only for England

CINDI Health Monitor<sup>49</sup>

- Survey conducted in Northern Ireland
- N=6000 individuals aged 16-74 years
- Questions on alcohol asked about whether the respondent had consumed alcoholic drinks during the previous year, and about the number of glasses (regular restaurant portions) or bottles of different types of alcoholic beverages were consumed during the previous seven days.
- Not used as conducted only in Northern Ireland and not throughout the UK

'Drinking in the UK: An exploration of trends' Report. May 2009<sup>170</sup>

- Provides an analysis of the trends in UK drinking over the last 20-30 years. Multiple tables; data taken from a number of data sources (frequently used data from the GHS 2006 data).
- Not used as alcohol consumption data is not in the format required and we did not obtain a response to our enquiries

ECAS study – European Comparative Alcohol Study - 2000

- See comments under Finland

EPIC - European Prospective Investigation into Cancer and Nutrition Study<sup>75</sup>

- Study initiated in 1992 in 10 countries (7 originally: France, Germany, Greece, Italy, Netherlands, Spain, UK, and between 1995-2000, addition of Sweden, Denmark, Norway). Aged 20 years and over (but mostly aged 30-75 at enrolment)
- Individuals recruited between 1993-1999, from the general population and residing in defined areas in each country with some exceptions. In the UK: 2 different areas only.
- Cambridge: Norfolk Population-based patients of general practitioners. Listed by general practitioners: men and women aged 45–74
  - Oxford: (1) local counties; (2) ‘health-conscious’ from England, Wales, Scotland
  - Northern Ireland (1) Population based in collaboration with general practitioners; (2) vegetarians, vegans and other health-conscious individuals in collaboration with vegetarian societies and magazines. (1) Listed by general practitioners: men and women aged 40–65; (2) men and women aged 20+, but targeted at those aged 35+
- Not used as only some regions were covered, relatively limited age range, and selected population sub-groups.

#### Eurobarometer 272b: Attitudes towards Alcohol

- See comments under Austria

#### European School Survey Project on Alcohol and other Drugs (ESPAD)

- See comments under Austria

#### GENACIS (Gender, Alcohol and Culture: An International Study) 2000<sup>41</sup>

- National survey conducted in 2000
- N=2001 individuals aged 18 years and over
- Not used as more recent data from the GHS have been selected

HBSC – Health Behaviour in School-aged Children 2005-2006 survey (NB HBSC surveys have been conducted in several countries since 1983/84. Most recent surveys are from 1997/1998, 2001/2002, and 2005/2006 – not all countries included in all surveys)

- See comments under Austria

#### Institute of Alcohol Studies (IAS) - Factsheets<sup>171</sup>

- Including: ‘Alcohol - Drinking in Great Britain’, ‘Adolescents and alcohol’
- Provides a wealth of quantitative data on alcohol consumption
- Not used as the information provided is not in the format required for the project

Health Education Monitoring Survey 1998 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as data relatively old

#### Health Survey for England (HSE)<sup>172</sup>

- Annual surveys begun in 1991; the HSE series is part of an overall programme of surveys commissioned by the Department of Health
- Surveys include individuals aged 16 years and over living in private households in England

- Each survey consists of core questions (including questions on alcohol consumption) and measurements which are included every year, plus modules of questions on specific health conditions that are repeated at intervals.
- Not used as data are only for England, not the UK

PRIME study - Prospective Epidemiological Study of Myocardial Infarction

- See comments under France

Scottish Health Survey 1995, 1998 (see <https://hishes.iph.fgov.be/index.php?hishes=home>)

- Not used as relatively old and data only for Scotland and not the UK

Study of health lifestyle behaviours in selected cities in Bulgaria and Scotland, 1994

- See comments under Bulgaria

World Health Survey (WHO) 2003<sup>173</sup>

- N=1200 households, 1200 individuals
- Not selected as small sample size and not a preferential choice as estimating alcohol consumption based on recall of alcohol consumption in the last 7 days (which tends to underestimate alcohol intake)

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