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2	Focus	Alcohol consumption of adults in Germany: Harmful drinking quantities, consequences and measures
21	Fact sheet	Cases of alcohol poisoning involving in-patient treatment
28	Fact sheet	Traffic accidents under the influence of alcohol
36	Fact sheet	Alcohol-related mortality among adults

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Alcohol consumption of adults in Germany: Harmful drinking quantities, consequences and measures

Abstract

Harmful alcohol consumption is one of the five essential risk factors for disease, impairments and premature death around the world. It is considered to be a contributory cause for more than 200 diseases and is co-responsible for causing many intentional and unintentional injuries.

In order to reduce harmful alcohol consumption, the health target “Reduce alcohol consumption” has been currently elaborated in Germany and focuses on a policy mix of behavioural and situational preventive measures to include as far as possible all relevant players for the development of overarching objectives.

The data from the recurrent health surveys by the Robert Koch Institute (RKI) allow an evaluation of trends of harmful alcohol consumption in the population aged 25 to 69 between 1990/1992, 1997/1999, and 2008/2011. Harmful alcohol consumption is defined as a daily consumption of pure alcohol of more than 10g for women and more than 20g for men. For the years 2008-2011 harmful alcohol consumption for the age group 18 to 79 years is calculated based on the “German Health Interview and Examination Survey for Adults” (DEGS1) and examined in connection with socio-demographic and health-related factors.

The results of DEGS1 show that 13.1% of women and 18.5% of men consume alcohol in harmful quantities. For men harmful alcohol consumption rises with the age; for women the lowest prevalence is found in those aged 30-39 years and the highest in the age group 50-59 years. Women with a high socio-economic status drink a harmful quantity of alcohol to a higher extent than women from medium or low status groups. For men there are no corresponding differences. Mainly smoking is associated with harmful alcohol consumption. Between 1990 and 1992 as well as between 2008 and 2011 harmful alcohol consumption has strongly declined, for women from 50.9% to 13.6%, for men from 52.6% to 18.3% (age group 25 to 69 years). Even if harmful alcohol consumption in the population has strongly declined, the per capita consumption of pure alcohol is above the average of the EU Member States in Germany. For that reason, preventive measures for specific target groups are required.

◆ HARMFUL ALCOHOL CONSUMPTION · ALCOHOL ABUSE · ADULTS · HEALTH SURVEY · TRENDS OVER TIME

Infobox: Exclusively alcohol-related diseases [2]

ICD-10	Explanation
E24.4	Alcohol-induced Pseudo-Cushing Syndrome
E52	Niacin deficiency (pellagra)
F10	Mental and behavioural disorders due to use of alcohol
G31.2	Degeneration of nervous system due to alcohol
G62.1	Alcoholic polyneuropathy
G72.1	Alcoholic myopathy
I42.6	Alcoholic cardiomyopathy
K29.2	Alcoholic gastritis
K70	Alcoholic liver disease
K85.2	Alcohol-induced acute pancreatitis (from 2006)
K86.0	Alcohol-induced chronic pancreatitis
O35.4	Maternal care for (suspected) damage to foetus from alcohol
P04.3	Foetus and new-born affected by maternal use of alcohol
Q86.0	Foetal alcohol syndrome (dysmorphic)
R78.0	Finding of alcohol in blood
T51.0	Toxic effect: ethanol
T51.9	Toxic effect: alcohol, unspecified

1. Introduction

1.1 Health and social consequences of harmful alcohol consumption

The consumption of alcoholic beverages has been spread in many cultures for a very long time. In traditional societies alcoholic beverages were prepared artisanally in small quantities and mainly consumed on special occasions such as celebrations. With industrialisation, the production and availability of alcohol changed. Spirits were introduced and as a result of improved production and transport conditions alcoholic beverages became a product which was available at any time of the year and every day of the week. Since the industrialised societies needed sober and attentive workers, excessive alcohol consumption was considered during the late 19th century as a growing social problem and burden for public health. As a result, increasing measures were taken to reduce or prohibit drinking [1].

Alcohol is a psychoactive substance which can cause dependence. Harmful alcohol consumption is, moreover, one of the five essential risk factors for diseases, impairments and premature death around the world. It is considered to be a contributory cause for more than 200 diseases and is co-responsible for causing many intentional and unintentional injuries [1].

The German Federal Statistical Office has compiled together with the German Institute for Medical Documentation and Information (DIMDI) a list of 17 diseases which are to be considered 100% as alcohol-related (cf. [Infobox Exclusively alcohol-related diseases](#)) [2]. According to this list, for 14,099 deceased in Germany in 2014 an exclusively alcohol-related disease was main cause of death [3].

Estimates from the “Global Burden of Disease Study” show, moreover, that on a worldwide level 5% of all disability-adjusted life years (DALYs) can be attributed to alcohol [4]. In Germany alcohol consumption ranges amongst all risk factors for DALYs in men fifth and in women eighth, referred to the year 2013 [5].

As far as the effects of alcohol consumption are concerned, the World Health Organisation (WHO) distinguishes not only between health consequences for consumers but also between socio-economic consequences for those concerned as well as damage to other persons and the society as a whole.

Damage for the individual includes chronic damage to tissues and organs due to the toxic effect of alcohol (harmful use or abuse, ICD-10: F10.1), acute alcohol intoxication which can consist in disturbances of co-ordination, consciousness, cognition and perception (ICD10: F10.0), as well as the development of an alcohol dependence (dependence syndrome ICD-10: F10.2).

The individual socio-economic consequences of harmful, abusive or dependent alcohol consumption can reach from stigmatisation, social withdrawal, family problems to the loss of job, residence and complete social exclusion. Damages for third parties are mainly caused by bodily injuries following violence or accidents, mental injuries and strains of partners, family, friends, colleagues as well as damages to unborn children (fetal alcohol spectrum disorder – FASD).

The social consequences of alcohol consumption include, apart from the direct costs for the health system, productivity losses as well as absenteeism at the workplace or early retirements as well as intangible costs, for instance as a result of a loss of quality of life. These economic costs of alcohol consumption in Germany are assessed according to estimates to reach an amount of up to EUR 40 billion per year; approximately one-third is accounted for by direct costs for the health system [2, 6].

1.2 Health policy initiatives to reduce alcohol consumption

On the international, European and national level there are a series of initiatives and strategies to reduce alcohol consumption in the population [7]. In the WHO “Global action plan for the prevention and control of non-communicable diseases” a relative reduction of the risk alcohol consumption by 10% until 2025 (versus 2010) is striven for. The objectives of the global WHO strategy to reduce harmful use of alcohol are:

- ▶ raise global awareness of the magnitude and nature of the health, social and economic problems caused by harmful use of alcohol, and increased commitment by governments to act to address harmful use of alcohol;
- ▶ strengthened knowledge base on the magnitude and determinants of alcohol-related harm and on effective interventions to reduce and prevent such harm;
- ▶ increased technical support to, and enhanced capacity of, Member States for preventing the harmful use of alcohol and managing alcohol-use disorders and associated health conditions;

- ▶ strengthen partnerships and better co-ordination among stakeholders and increased mobilisation of resources required for appropriate and concerted action to prevent the harmful use of alcohol;
- ▶ improved systems for monitoring and surveillance.

In detail, 10 fields of action are mentioned in which governments should act. They are: (1) Leadership, awareness and commitment, (2) Health services’ response, (3) Community action, (4) Drink-driving policies and counter measures, (5) Availability of alcohol, (6) Marketing of alcoholic beverages, (7) Pricing policies, (8) Reducing the negative consequences of drinking and alcohol intoxication, (9) Reducing the public health impact of illicit alcohol and informally produced alcohol and (10) Monitoring and surveillance. For each of these fields of action, action strategies have been formulated and priority fields of action are referred to [8]. In the “European action plan to reduce the harmful use of alcohol 2012-2020” of WHO [7] the fields of action of the global strategy are referred to and adapted to the European Region of WHO.

The European Commission submitted a strategy to support Member States in reducing alcohol-related harm in 2006 [9]. Since regulations in the field of health come within the sphere of responsibility of the Member States, it does not have a binding character. It focuses on the prevention of high and extreme alcohol consumption as well as the reduc-

tion of alcohol consumption of young people and some of the most negative effects of alcohol-related traffic accidents and the fetal alcohol syndrome. The strategy is hence not dealing with alcohol consumption as such but with its abuse and its damaging effects. Five areas were mentioned in which a joint approach of the Member States can have an added value:

- ▶ protect young people, children and the unborn child,
- ▶ reduce injuries and death from alcohol-related road accidents;
- ▶ prevent alcohol-related harm among adults and reduce the negative impact on the workplace;
- ▶ inform, educate and raise awareness on the impact of harmful and harmful alcohol consumption, and on appropriate consumption patterns;
- ▶ develop and maintain a common evidence base at EU level.

On a national level, the national strategy for drug and addiction policy is guiding the different actions [10]. It stresses that a successful alcohol prevention requires a bundle of regulations, information and behavioural preventive measures, and alcohol prevention must be seen as a social cross-sectional task (“policy mix”). The national strategy refers to eight goals to fight alcohol consumption and its consequences:

- ▶ the reduction of the frequency of heavy episodic drinking amongst children and adolescents;
- ▶ the consistent implementation of the existing regulations of the Youth Protection Act;

- ▶ the protection of children and adolescents from alcohol advertising;
- ▶ the reduction of alcohol consumption in road traffic;
- ▶ the situational abstinence at the workplace;
- ▶ the situational abstinence during pregnancy and breastfeeding;
- ▶ the reduction of alcohol-related violence;
- ▶ the concentration on risk groups in the adult population.

As far as advertising for alcoholic beverages is concerned, the focus is on the self-control of the alcohol industry which is to be evaluated by an independent body. In order to achieve situational abstinence at the workplace, the strategy relies on the promotion of corporate agreements as well as model projects on addiction prevention at the workplace. As far as the fields of action of pricing and availability of alcohol are concerned, the strategy does not include any statements. Concerning the availability of alcohol, there are, however, some provisions in the Youth Protection Act as well as in the Restaurant and Pub Act. Some federal states or municipalities have adopted regulations on the selling time for alcohol, restrictions of consumption through substantiated local prohibitions of alcohol or alcohol prohibitions in public transportation. Overall, there are to a large extent no statutory provisions in the field of pricing, advertising and availability. Germany is amongst the European countries in which a comparatively high alcohol consumption goes along with low statutory restrictions [11]. The health target “Reduce alcohol consumption”, which was published in a first

Infobox: Forms of alcohol consumption harmful to health

Harmful alcohol consumption

A consumption pattern is designated as consumption of harmful drinking amounts of alcohol if the risk of damaging consequences for the bodily and mental health are increased [47]. An average daily alcohol drinking amount of more than 10-12g for women and 20-24g pure alcohol for men is defined as harmful [45, 48].

Heavy episodic drinking

Heavy episodic drinking (HED) refers to the consumption of 60g or more of pure alcohol at a drinking occasion taking place at least once a month. This amount corresponds to the consumption of six standard glasses of alcoholic beverages which contain approximately 10g of pure alcohol per glass each.

Alcohol abuse (harmful alcohol consumption, damaging use)

Alcohol abuse designates a consumption pattern which leads to physical and mental health damages and normally goes along with a habitual consumption of large amounts of alcohol. According to ICD-10 alcohol abuse (ICD-10: F10.1) is differentiated from alcohol dependence (ICD-10: F10.2) insofar as abuse does not (yet) involve an overwhelming craving or compulsion to consume [49].

version in 2015, the fields of action advertising, pricing and availability are still to be tackled and corresponding goals are to be elaborated [12].

The practical implementation of measures for alcohol prevention is based on a series of projects and campaigns. These include, more particularly, the activities the Federal Centre for Health Education (BZgA), for instance with the campaign “Know your limit” for adults and adolescents and a campaign “Zero alcohol – full power” for the target group of the 12-16-year-olds as well as the national “Alcohol Action Week” of the German Centre for Addiction Issues (cf. [2]). The alcohol prevention project “HaLT” (“Close to the limit”) combines approaches on an individual and municipal level and targets, more particularly, young people who have already attracted attention because of harmful alcohol consumption.

In order to verify how the consumption of alcoholic beverages and its health and social effects develop, continuous monitoring is necessary. In the long-term this represents an important aspect to review the achievement of goals of initiatives such as the health target “Reduce alcohol consumption” as well as the efficacy of the general social efforts through situational and behavioural preventive measures.

The goal of this paper is to present, based on the data of health monitoring at the Robert Koch Institute, the prevalence of the consumption of harmful alcohol drinking quantities in the adult population in Germany and to identify the relationship with important socio-demographic and health-related factors. Since the adult review surveys – the East/West survey 1991 (OWg1), the

Federal Health Survey 1998 (BGS98) as well as the study on the health of adults in Germany (DEGS1) – permit the representation of the development over the past 25 years, the long-term development of the harmful alcohol consumption shall be analyzed. Consequently, these results represent an important supplement to the already existing trend analyses [13-15].

2. Method

2.1 Measurement of alcohol consumption in the population – data sources and indicators

In general, science distinguishes between different forms of alcohol consumption with a hazard to health and its consequences. These include the consumption of harmful alcohol drinking quantities, heavy episodic drinking, alcohol abuse, alcohol dependence and alcohol use disorder (see Infobox [Forms of alcohol consumption harmful to health](#)). Within the framework of its “Global action plan for the prevention and control of non-communicable diseases” [16] WHO specifies as a minimal set of indicators 1. Per capita consumption of pure alcohol for consumers aged ≥ 15 , 2. Age-standardised prevalence of heavy episodic drinking among adolescents and adults and 3. Alcohol-related morbidity and mortality among adolescents and adults. In addition, WHO points out that these indicators may be put together in accordance with the national context and may be supplemented by additional indicators.

This study concentrates on the prevalence of harmful alcohol consumption. Supplementary information on the per capita consumption of pure alcohol can be

Alcohol dependency

Alcohol dependency exists if there is a strong and frequently not controllable craving to consume alcohol. At the same time there is a mental concentration on alcohol consumption and a loss of control over the drinking quantity [49].

Alcohol use disorder

An alcohol use disorder exists in accordance with DSM-5 if a person meets certain diagnostic criteria. These include, for instance, difficulties to control alcohol consumption, the continuation of consumption despite problems resulting from the alcohol consumption, a habituation and withdrawal symptoms and the lasting craving for alcohol. The overlapping in terms of content with the diagnostic criteria for alcohol abuse and alcohol dependence is due to the fact that upon the introduction of DSM-5, abuse and dependence were merged in a diagnostic system for the joint diagnosis of alcohol use disorder.

found in the discussion section. Moreover, the fact sheets include information on the [topics alcohol-related mortality, road traffic accidents under the influence of alcohol](#) and acute [alcohol intoxications with in-patient treatment](#).

In order to determine the alcohol consumption in the population, there is on the one hand the possibility to rely on data from excise duty statistics and on the other hand interview data from representative studies can be used. A significant predictor for alcohol-related negative health and social consequences is the per capita consumption of alcoholic beverages [2]. Representative population surveys offer the opportunity to describe different drinking patterns in the population in detail and analyse them by socio-demographic characteristics such as age and gender. The alcohol consumption is determined in specific population studies through special survey instruments such as the Alcohol Use Disorder Identification Test (-Consumption) (AUDIT and AUDIT-C) [17] or frequency quantity indexes which determine the frequency and quantity of consumption of specific alcoholic beverages which are converted to an average consumption of pure alcohol in gram per day. Moreover, there are specific tools to survey substance-related disorders (here: alcohol abuse and alcohol dependence) such as the Munich Composite International Diagnostic Interview (M-CIDI; [18]).

2.2 Included studies

DEGS1 is an integral part of the health monitoring by the Robert Koch Institute. The study design and goals

of DEGS1 have been described in detail elsewhere [19, 20]. DEGS1 was carried out between 2008 and 2011. The target population was the residential population living in Germany aged between 18 and 79 years. DEGS1 has a mixed design which permits both cross-sectional and longitudinal analyses. In this connection registry office samples were supplemented by former participants in BGS98. Altogether 8,151 persons participated, including 4,192 persons invited for the first time (response rate 42%) and 3,959 former BGS98 participants (response rate 62%). The participants were interviewed (health questionnaire, nutrition questionnaire, medical interview, medicines interview) and examined (including laboratory analyses of biomarkers). For the trend analyses additional data from the health survey OW91 [21] as well as BGS98 [22] were used. For reasons of comparability only the age groups 25-69 years were included into the analyses. The evaluations covered datasets of 7,463 persons from OW91, 5,684 persons from BGS98 and 5,305 persons from DEGS1.

2.3 Estimate of the consumption quantity of pure alcohol

In the DEGS1 food frequency questionnaire the consumption frequencies and consumption quantities of altogether 53 food groups referred to the last four weeks before the survey were conducted. These include the alcoholic beverages beer, wine, high-proof beverages and cocktails and/or mixed beverages. In order to determine the frequency, the question asked was for instance "How often have you consumed wine, sparkling wine or fruit wine?". The interviewees had the possibility to answer

either “never”, “once a month”, “2-3 times a month”, “once to twice per week”, “3-4 times per week”, “5-6 times per week”, “once a day”, “twice a day”, “3 times a day”, “4-5 times a day” or “more often than 5 times a day”. The quantity consumed was determined with the question “If you drink wine, sparkling wine or fruit wine, how much do you drink in most cases?”. The possible answers were in this case “1 glass (125ml), 2 glasses, 3 glasses, 4 glasses, 5 glasses (or more)”. For the other beverages the possible answers for the quantity determination were different. Beer was, for instance, measured in 330ml bottles, cocktails/mixed drinks as number of beverages and high-proof beverages as glasses of 2cl.

The frequency and quantity data as well as the standard values for the mean alcohol contents of the beverages per litre – beer 38.11g, non-alcoholic beer 3.97g, wine 87.34g, distilled spirits 262.02g and cocktails/mixed drinks 75g – were used to estimate the average amount of alcohol in gram per day with the following formula:

$$\text{Alcohol per beverage type (g/day)} = \frac{\text{Frequency in 4 weeks} \times \text{Average amount(l)} \times \text{Alcohol content (g/l)}}{28}$$

For the calculation of the indicator “harmful alcohol consumption” the daily drinking quantity of more than 10g pure alcohol for women and 20g pure alcohol for men was classified as harmful (see Infobox [Forms of alcohol consumption harmful to health](#)).

2.4 Further variables

The health behaviour is frequently conditioned by factors of different dimensions. This is why in this contextual analysis not only age and the socio-economic status but also the characteristics health condition (subjective assessment), health behaviour (tobacco consumption, sports activities) and social support have been taken into consideration.

For the determination of the socio-economic status an index was calculated by taking into account the three status dimensions education, occupation and income [23]. The self-rated health condition was surveyed on the basis of a question from the Minimum European Health Module (MEHM): “How is your health in general?” [24]. The five possible replies were subsequently summed-up in the two categories “very good/good” and “fair/bad” (including “very bad”).

“Smokers” were defined in this analysis as persons who stated that they smoke on a daily basis or occasionally.

The sports activity was recorded by asking about the frequency of sports activities during the past three months [25]. If a person selected the category “no sports activities”, this person was considered to be inactive in terms of sports and when selecting one of the other four categories (from “below one hour per week” to “four hours per week and more”), the person was considered as active in terms of sports activities.

The social support was measured based on the “Oslo-3 Items Support Scale” (Oslo-3) [26]. The three questions of the tool refer to the number of persons on

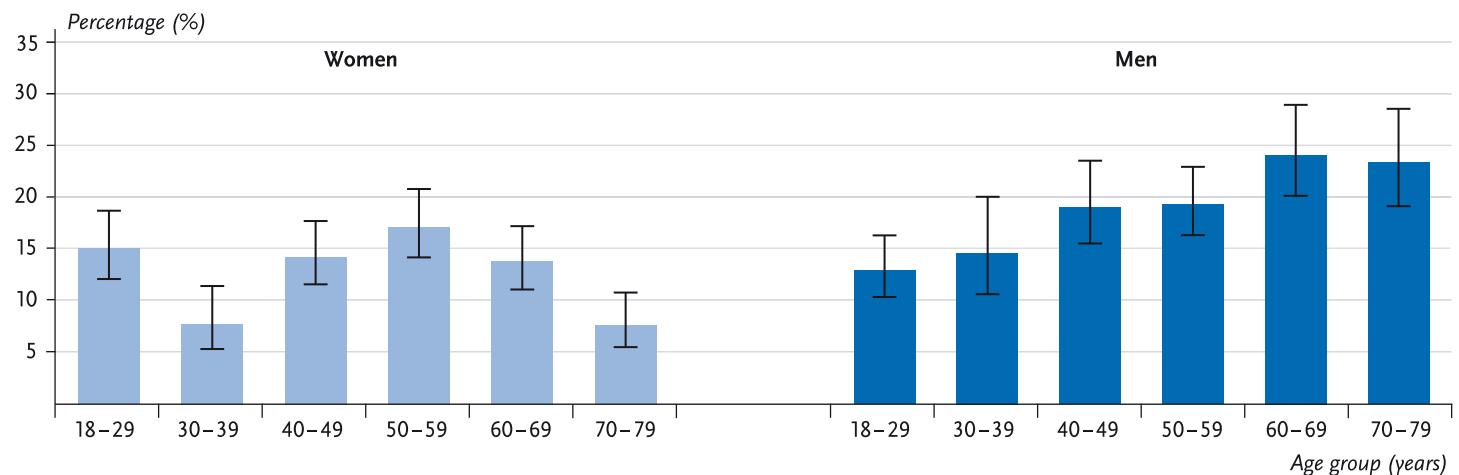
whom one can count if one has serious problems, the assessment of the concern that people show in what one is doing as well as the possibility to get practical help from neighbours. The calculated overall score was sub-divided into the three categories “poor support”, “moderate support” and “strong support” [27].

2.5 Statistical analysis

The cross-sectional and trend analyses were conducted with a weighting factor which corrects deviations of the sample from the population structure (status: 31.12.2010) in terms of age, gender, region and nationality as well as type of community and education. All analyses were based on the survey procedures of Stata SE 14 taking into account the weighting and cluster design effect. The descriptive analysis of harmful alcohol consumption, differentiated by further variables (gender, age, socio-economic status, surveying period),

was made by calculating prevalences with 95% confidence intervals. Based on the Pearson χ^2 test the differences in harmful alcohol consumption between groups (e.g. men and women) as well as between the survey periods were checked for statistical significance ($p < 0.05$). In sub-groups the 95% confidence intervals were used in order to identify significant differences (e.g. differences between two periods of time in a certain age group of men). In order to adjust the effects of important factors which are associated with harmful alcohol consumption against each another, multivariate analyses (binary logistic regressions) were calculated separately by gender. The dependent variable represented harmful alcohol consumption (reference group: no harmful alcohol consumption) and the independent variables were the age, the socio-economic status, the subjectively assessed health condition, the smoker status, the sports activities as well as social support.

Fig. 1
Prevalence of harmful alcohol
consumption by age (n=7,006)
Source: DEGS 1 2008–2011



13% of the women and 19% of the men aged between 18 and 79 years drink alcohol in harmful quantities.

3. Results

3.1 Frequency of harmful alcohol consumption and multivariate analysis

The results of DEGS1 show that 13.1% of the women and 18.5% of the men consume on a daily average more than 10g (women) or 20g pure alcohol (men) and hence tend to show harmful consumption. Men consume significantly more frequently alcohol in harmful quantities than women. The share of men with harmful alcohol consumption rises with age and reaches the maximum in the age group 60 to 69 years. In this age group almost one-fourth of the men shows harmful alcohol consumption. For women the lowest prevalence of harmful alcohol consumption is amongst the 30 to 39-year-olds and the highest amongst the 50 to 59-year-olds (Figure 1).

In addition to the differences in prevalence by age, women show significant differences in harmful consumption by socio-economic status: the prevalence of harmful consumption is significantly higher for women with a high socio-economic status than for women from

medium and low status groups. For men there are no significant differences in this respect (Figure 2).

A multivariate analysis of correlations between harmful alcohol consumption and socio-demographic factors, health condition, health behaviour as well as social support shows that the factors associated with harmful alcohol consumption are partly different between women and men (Table 1). Whereas a harm-

Fig. 2
Prevalence of harmful alcohol consumption
by socio-economic status (n = 6,966)
Source: DEGS 1 2008–2011

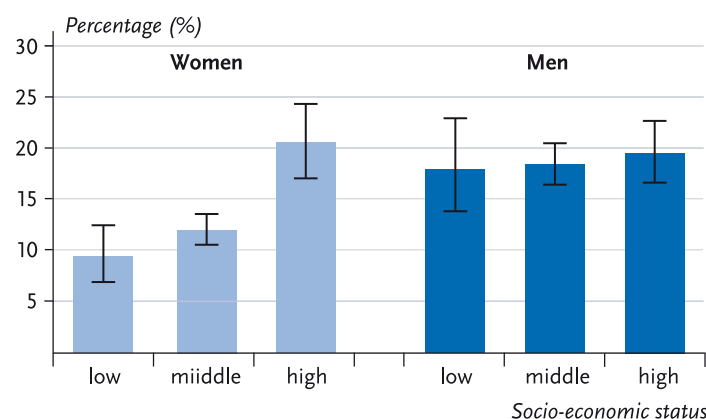


Table 1
Correlation between harmful alcohol
consumption and socio-demographic as well
as health-related factors. Results of binary
logistic regressions by gender (n = 6,757)
Source: DEGS 1 2008–2011

	Women OR (95 %-CI)	Men OR (95 %-CI)
Age		
18–29 years	Ref.	Ref.
30–39 years	0,5 (0,3–0,8)	1,1 (0,7–1,8)
40–49 years	1,0 (0,7–1,4)	1,8 (1,2–2,6)
50–59 years	1,3 (0,9–1,9)	1,8 (1,3–2,7)
60–69 years	1,2 (0,8–1,7)	2,7 (1,9–3,9)
70–79 years	0,7 (0,5–1,2)	3,1 (2,0–4,7)
Social status		
Low	0,5 (0,3–0,7)	0,8 (0,5–1,3)
Medium	0,5 (0,4–0,7)	0,9 (0,7–1,1)
High	Ref.	Ref.
Subjective health condition		
Very good/good	1,4 (1,0–2,0)	1,5 (1,2–2,0)
Fair/bad	Ref.	Ref.
Smoking		
Yes	1,7 (1,3–2,2)	2,0 (1,5–2,6)
No	Ref.	Ref.
Sports activities		
Yes	1,3 (1,0–1,7)	0,8 (0,6–1,1)
No	Ref.	Ref.
Social support		
Poor	1,3 (0,8–2,0)	0,7 (0,5–1,0)
Moderate	1,0 (0,8–1,3)	1,0 (0,8–1,3)
Strong	Ref.	Ref.

OR = Odds ratios; 95%-CI = Confidence interval; Ref. = Reference group; Bold: significant (p<0.05)

Women with a high socio-economic status have a risk which is double as high to drink a harmful quantity of alcohol compared to women from medium and lower status groups.

ful alcohol consumption is related to age, the socio-economic status and tobacco consumption for women, there is, by contrast, no connection to the socio-economic status for men. Unlike women, harmful alcohol consumption for men is, however, associated with a better self-assessed health condition. In concrete terms, the frequency of harmful alcohol consumption is lower in women between the age of 30 and 39 than for younger women. For the other age groups there is, however, no significant correlation between age and alcohol consumption. Moreover, women with a low and medium socio-economic status consume less frequently harmful quantities of alcohol than women from the high status group. The correlations between harmful alcohol consumption, age and the socio-economic status of women from the bivariate analysis can be confirmed taking into account additional factors. Furthermore, female smokers have more frequently a harmful alcohol consumption than female non-smokers. As far as men are concerned, there is likewise a correlation between harmful alcohol consumption and age, taking into account additional factors, but there is a different pattern than for women. The frequency of harmful alcohol consumption rises for men continuously with age and is for the age group 70 to 79 years three times as high as for the youngest age group. Moreover, men who assess their health condition as very good or good consume more often harmful quantities of alcohol than men who assess their health condition as moderate or poor. In a similar way as for women, smokers have twice as frequently a harmful alcohol consumption than non-smokers.

Fig. 3
Trend of harmful alcohol consumption for women and men (25–69 years; n=18,452)
Source: OW91 (1990–1992), BGS98 (1997–1999), DEGS1 (2008–2011)

3.2 Trends in harmful alcohol consumption

Since in earlier surveys by RKI (see 2.2 Method) data on frequency and quantity of alcohol consumption had been polled, it is also possible to present the development of harmful alcohol consumption from 1991–2011 for the age groups of 25–69-year-olds over time. This shows both for men and for women a strong decline in harmful alcohol consumption across the entire surveying period. Whereas in 1990–1992 every second woman and every second man consumed harmful quantities of alcohol, this was only the case for every seventh woman and every fifth man in 2008–2011 (Figure 3).

The analysis by age shows for women a constant decline in harmful alcohol consumption across all age groups. For men this trend is confirmed for those aged between 25 and 34 and those aged between 35 and 44 years. For men in the higher age groups (45–54 and 55–69 years) it has likewise been possible to establish a decline in risky alcohol consumption from 1990–1992

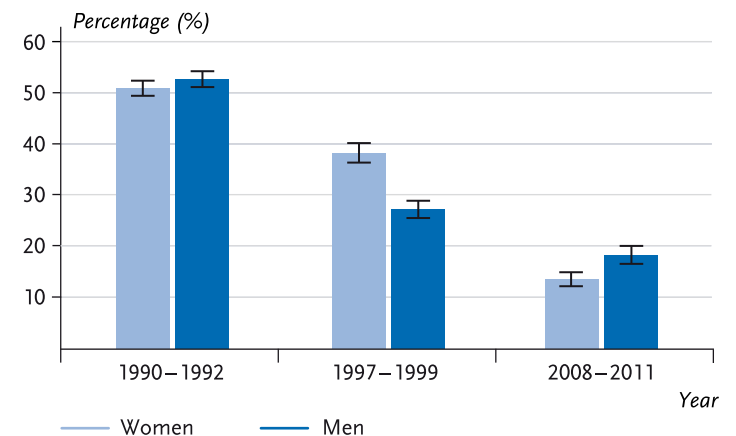
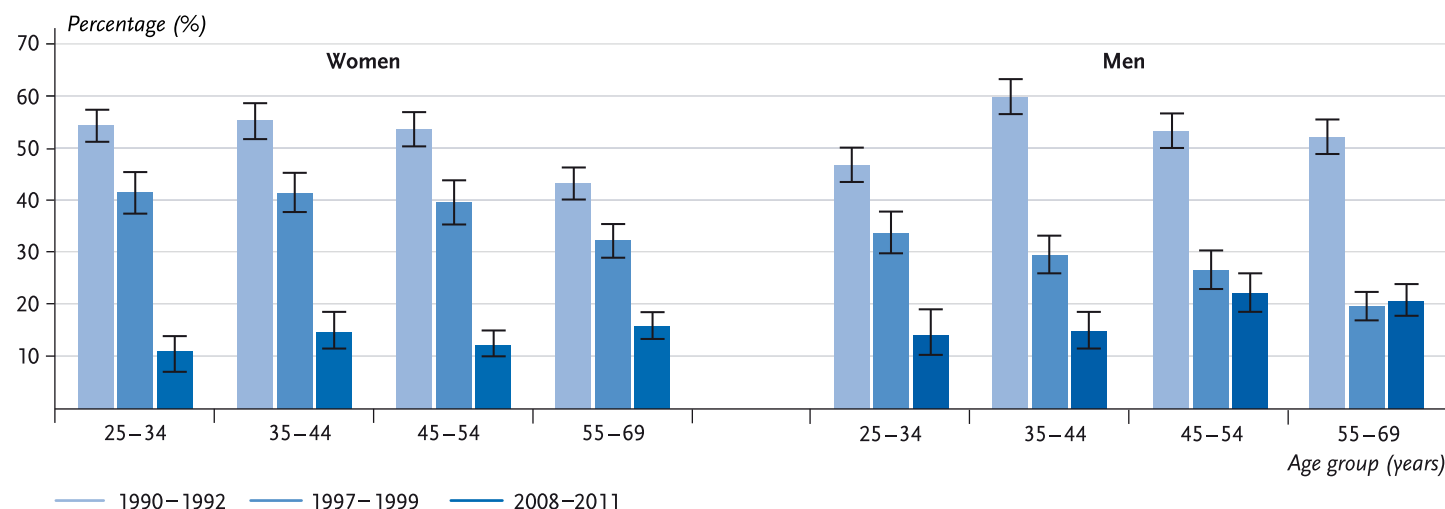


Fig. 4
Trend of harmful alcohol consumption
for women and men (25-69 years)
by age groups (n = 18,452)
Source: OW91 (1990–1992),
BGS98 (1997–1999), DEGS1 (2008–2011)



The share of consumers with harmful quantities increases in the event of men with age; for women the share is highest in the age group 50 to 59 years.

versus 1997-1999. In the period from 1997-1999 versus 2008-2011 there is, however, only a slightly decline for men aged 45-54 years, whereas men aged 55-69 years showed a stagnating share of consumers with harmful quantities between the two periods (Figure 4).

4. Discussion

13.1% of the women and 18.5% of the men aged between 18 and 79 years consume on average more than 10g (women) or 20g pure alcohol (men) per day and therefore tend to have a harmful consumption. At the interpretation of the data it has to be taken into account that in the event of self-reporting of alcohol consumption there can be an underestimation because the interviewees tend frequently towards a socially desired answering behaviour in view of their actual drinking behaviour. Nonetheless all representative German data sources

show prevalences of harmful alcohol drinking quantities on a comparable level. The results of DEGS1 are, for instance, comparable to those from the epidemiological survey (ESA) 2012. Amongst the interviewees of this study 12.8% of the women and 15.6% of the men aged between 18 and 64 years consume alcohol in harmful quantities (28). As far as this comparison is concerned, it must be taken into account that the limit value for harmful consumption is 12g (women) or 24g (men) pure alcohol per day in the ESA and that only the age groups between 18 and 64 years are covered. The results from DEGS1 can be considered as robust against this back-drop.

Moreover, the DEGS1 data show that among men the consumption prevalences are highest in the age groups from 60 to 69 years and from 70 to 79 years. The age group of men aged 18 to 29 years shows, by contrast, comparatively low prevalences. As far as this is con-

The per capita consumption of pure alcohol of those aged ≥ 15 has likewise declined since 1990. Nonetheless it continues to be above the average of the EU Member States.

cerned, the DEGS data are different from those of other German study results. The data from the alcohol survey 2012 of BZgA for the age group of men aged between 18 and 25 years show values of 19.2% for the harmful consumption [29]. The low prevalences of women aged between 30 and 39 years are matching in DEGS₁ and ESA and are probably, in addition to pregnancy and breastfeeding, due to the lower alcohol consumption of mothers [30]. In conformity with all other studies, DEGS₁ shows generally higher shares of men with harmful consumption compared to women. This gender difference is explained, amongst others, by a different habitual drinking behaviour of women and stronger social sanctions against women in the event of deviating behaviour [31].

The prevalence of harmful consumption in accordance with AUDIT-C is with 25.6% for women and 41.6% for men significantly higher than the prevalence using the quantity frequency index [32]. In this connection it has to be taken into account that the AUDIT-C can also be applied together with the limit values used in DEGS₁ for the screening of abusive and dependent alcohol consumption and moreover contains information about heavy episodic drinking [33]. Furthermore, it does not refer to the consumption of the past four weeks but asks for drinking behaviour in general.

The stratification according to the socio-economic status shows a gradient for women to the effect that in the high status group the highest prevalence of harmful consumption can be found. For men this cannot be observed. A comparable result was already obvious in the evaluations of BGS98 [34]. In addition, international

studies confirm that women with a higher educational level are more likely to drink harmful amounts of alcohol than women with a lower educational level, while this correlation does not exist for men [35, 36]. Women with a higher socio-economic status possibly orient themselves less towards the traditional role sort compared to women from lower status groups. Analyses from countries with low or medium income suggest that there is in particular a correlation between paid employment of women and harmful alcohol consumption [37].

The effects of harmful alcohol drinking quantities are, however, not equally serious in all status groups: international studies show that the same high alcohol consumption causes more damage to health in disadvantaged groups than in privileged groups. This “alcohol harm paradox” is explained, amongst others, by the fact that in disadvantaged groups health risks such as smoking, obesity, poor nutrition and lack of physical activity are more often present in combination and the persons concerned, moreover, have a higher prevalence as far as heavy episodic drinking is concerned [38]. Together these factors increase the risk of diseases and alcohol-related damages such as accidents and injuries. A meta-analysis including data from 25 countries shows that women and men with a lower educational level have a higher risk concerning alcohol-related damages, even when taking into account the different drinking patterns. The fact that problems become significantly more visible in persons with a low educational level than in persons with a higher level, is attributed to different social and environmental resources in coping with stress or other problems [39].

The results of the regression analysis suggest, however, that men who assess their health condition as very good to good drink to a higher extent alcohol in harmful quantities regardless of their age, socio-economic status and other health behaviour. There is a tendency to see this correlation also in women. Persons who perceive their health condition as very good to good probably take care less frequently of a moderate alcohol consumption compared to persons who perceive themselves as impaired in terms of health. A positive correlation between the self-assessed health condition and harmful alcohol consumption was also confirmed in other studies [40].

Moreover, the results of the regression analysis prove the correlation between smoking and alcohol consumption, regardless of age, socio-economic status and health condition. Two approaches seem appropriate to explain this correlation: on the one hand, smokers seem to be more disposed to consume alcohol also in higher amounts. On the other hand, situations in which alcohol is consumed enable in most cases also to smoke on that occasion [41]. Since a smoking ban in bars and pubs has so far not been comprehensively introduced, this correlation continues to apply in Germany. Not least because alcohol and tobacco consumption increase together the risk of subsequent morbidity and mortality [42, 43], health promotion and prevention measures should not address an individual health behaviour in isolation, but should focus altogether on promoting a healthy lifestyle.

The results of the trend analysis prove a strong decline in consumption of harmful alcohol drinking quantities between 1990 and 1992 as well as 2008 and 2011, for

men from 52.6% to 18.3%, for women from 50.9% to 13.6% (referred to the 25 to 69-year-old population). By analogy to DEGS1, the trend analyses of the ESA data likewise prove a decline in harmful consumption (age group 18 to 59 years) between 1995 and 2012 [14]. Finally, the regularly collected values of the alcohol survey of BZgA show that during the past years the prevalence of harmful alcohol consumption decreased for young men aged between 18 and 25 years. The share of 18 to 25-year-old women who drink harmful amounts of alcohol has again been increasing since 2012 [15].

Overall, the decline in alcohol consumption is not only revealed by population studies but also by consumption statistics: since 1991 the annual per capita consumption of the population aged 14+ decreased from 14.5 litres to 11.6 litres pure alcohol in 2014. This decrease is mainly attributable to a lower beer consumption. The consumption of wine and spirits has undergone only unessential changes [44].

Even if the trend analyses suggest altogether a declining alcohol consumption among the population, Germany ranges on an international comparison basis, measured in terms of per capita consumption of pure alcohol of the population aged ≥ 15 , above the average of the EU Member States [2]. The growing rates of harmful alcohol consumption amongst young women [15] as well as the stagnating declines of harmful alcohol consumption among men aged 45 to 69 years are an indication of special target groups for health promotion and prevention. Moreover, it has to be taken into account that a considerable part of the persons consuming on average less than 10g (women) or 20g pure alcohol

Infobox: Low-risk alcohol consumption.
Enjoying responsibly, adhering to the limit

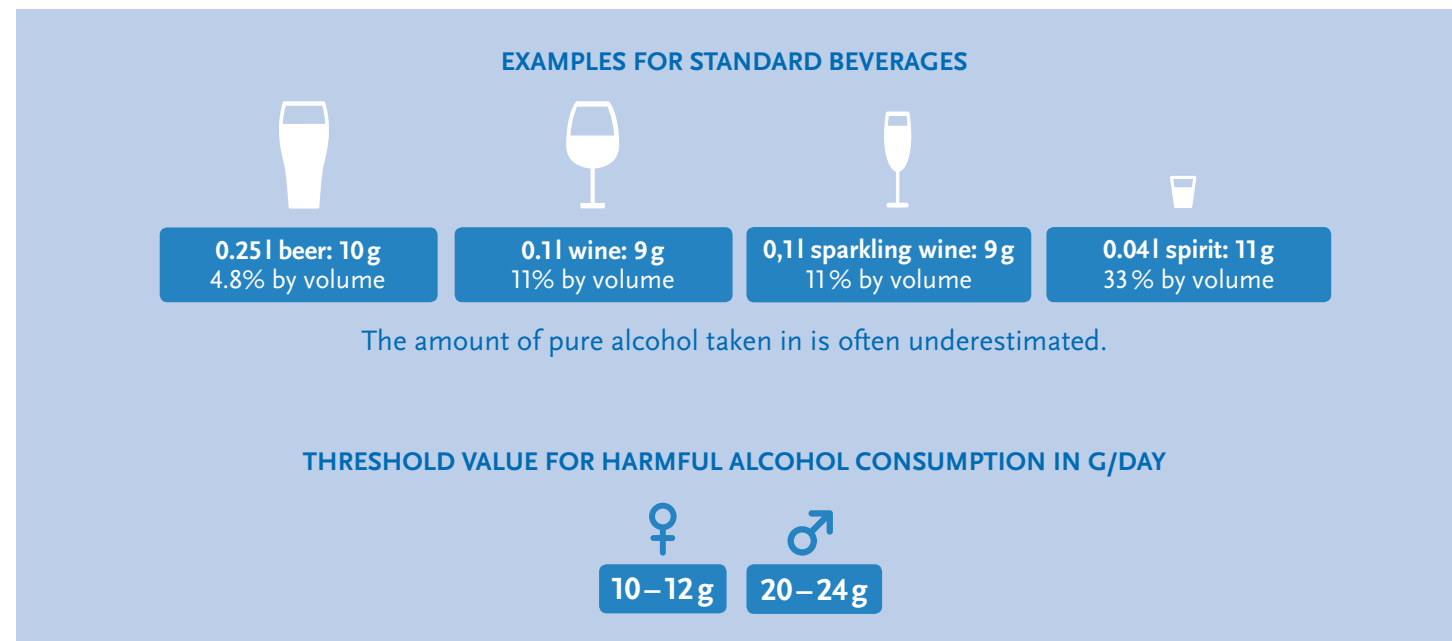
8 tips for health-conscious alcohol consumption

1. As a woman you should not drink more than one standard glass of alcohol per day, as a man no more than 2 standard glasses per day.
2. Do completely without alcohol on at least two days per week.
3. Avoid to get drunk.
4. Do without alcohol at the workplace, in road traffic and at sports.
5. No alcohol during pregnancy and breastfeeding.
6. Do not serve any alcohol to children and check the alcohol consumption of adolescents.
7. Pay particular attention to your alcohol consumption as a senior person.
8. Avoid to combine alcohol and medicines and clarify when your health should prevent you from drinking alcohol.

<http://www.kenn-dein-limit.de>

(men) per day can have problematic alcohol consumption, in particular heavy episodic drinking and not be reached by specific prevention measures. Apart from a consistent compliance with the statutory framework conditions, the adherence to the concept of situational abstinence during pregnancy and breastfeeding, at the workplace, in road traffic and during sports, additional options should be developed to reduce alcohol consumption on a social level. This includes a review of the possibilities in the field of pricing and regulations on the availability of alcohol, an increasing awareness of the problem on the political and community level as well as the promotion of a culture of “closely watching” and an alcohol-free or low hazard consumption behaviour in

different life phases and life worlds. Finally, early detection and early intervention should be enhanced together with the support of addiction-burdened families and their children. At the same time an occasional glass of alcohol in general is not detrimental to health. In order to be able to achieve a reduction of alcohol consumption in the population, the propagation of responsible dealing with alcoholic beverages is a useful approach. For a low-risk enjoyment an orientation towards limit values which have been formulated for healthy adults makes sense [45]. As prevention messages these recommendations are part of the campaign “Know your limit” of the Federal Office for Health Education (see [Infobox Low-risk alcohol consumption](#)).



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Cases of alcohol poisoning involving in-patient treatment

Abstract

Alcohol poisonings represent the direct consequences of excess alcohol consumption. In 2014, in Germany 115,967 persons aged 10 to 79 years were treated as in-patients with the diagnosis “acute alcohol intoxication”. In almost all age groups, male persons are affected significantly more frequently than female persons. In the past 14 years, the number of alcohol poisonings involving in-patient treatment amongst children, adolescents and adults has more than doubled. The need to prevent excessive alcohol consumption remains a key objective. Preventive measures should begin while children are still at an early age and in adolescence.

📌 ALCOHOL POISONING · IN-PATIENT TREATMENT · ADOLESCENTS · ADULTS · GERMANY

Introduction

Alcohol consumption is widespread in Germany [1-4]. The individual consequences of high-risk, abusive or addictive consumption include damage to internal organs, cancer, cardio-vascular and gastrointestinal disorders, mental and neurological afflictions and higher mortality [5-8]. Moreover, direct individual consequences of alcohol consumption include increased danger of accidents and injuries as well as acute alcohol poisoning (alcohol intoxication). The extent of intoxication can vary significantly in individual cases and depends on the level of alcohol concentration in the blood. Consequences of intoxication can therefore cover a wide spectrum. These include an upset sense of balance, speech impediments, delayed reaction times, reduced pain perception, nausea and vomiting, unconsciousness and, in extreme cases, death.

Prevention of alcohol-related effects represents a key element of numerous public health strategies. For

instance, the “Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020” of the World Health Organization (WHO) calls for a relative reduction of high-risk alcohol consumption by 10% between the years 2010 and 2025 [9]. In Germany, a reduction in alcohol consumption and the consequences thereof has become part of the national health targets [10].

To be able to assess the level of target achievement, continual monitoring of central indicators is indispensable. Accordingly, in its action plan the WHO proposes a measurement of per-capita consumption of pure alcohol, the prevalence of severe binge drinking and alcohol-related morbidity and mortality as core indicators and recommends that this list be extended in a national context. In the present edition of Public Health Monitoring, information on high-risk alcohol consumption and on per-capita consumption is prepared as part of a focus (link to [focus](#)). In addition, there are fact sheets

In 2014, a total of 115,967 persons aged 10 to 79 years were treated as in-patients with the main diagnosis “acute alcohol intoxication”.

on [traffic accidents under the influence of alcohol](#) and on [alcohol-related mortality](#). The present fact sheet augments this information to include in-patient treatment on account of acute alcohol poisoning.

Indicator

Anyone treated for acute alcohol intoxication as an in-patient is documented in the Hospital Diagnosis Statistics of the German Federal Statistical Office. The Hospital Diagnosis Statistics are an annual total survey that is carried out by the German Federal Statistical Office, in which data on patients under full-time institutional care at all German hospitals are recorded, including their gender, age and main diagnosis [11]. The diagnosis is coded according to the diagnosis codes of the 10th Revision of the “International Statistical Classification of Diseases and Related Health Problems” (ICD-10). For the evaluations of the fact sheet, reference was made to the ICD-10 code F10.0 “Mental and behavioural disorders due to use of alcohol: acute intoxication” [12].

As an indicator, the absolute number of treatment cases in 2014 and in the course of time from the year 2000 to 2014 is evaluated by gender and age. In addition, the relevant rates per 100,000 inhabitants are analysed. The calculations include persons aged 10 to 79 years.

Classification of findings

In 2014, a total of 115,967 persons aged 10 to 79 years were treated as in-patients with the main diagnosis “acute alcohol intoxication” (Table 1). In the age group of 10 to 19-year-olds, amongst girls 9,254 cases (245 cases per 100,000 inhabitants) and amongst boys 12,975 cases (325

cases per 100,000 inhabitants) were registered. In the category of women aged 20 to 79 years, 25,260 cases (81 cases per 100,000 inhabitants) were recorded in the statistics; amongst men of the same age, there were 68,478 cases (224 cases per 100,000 inhabitants).

Male persons were treated significantly more frequently as in-patients than female persons in almost all age groups. Only in the category of 10 to 14-year-olds were more girls involved than boys. In the course of time, it is evident that the frequency of acute alcohol intoxications involving in-patient treatment increased significantly from the year 2000 to 2014 (Fig. 1). Amongst girls aged 10 to 19 years, it was up by 162%, compared with +120% amongst boys of the same age. Since 2012, however, there has been evidence of a slight downward trend in the number of cases treated amongst 10 to 19-year-olds of both genders. Amongst women aged 20 to 79 years, in-patient treatment for

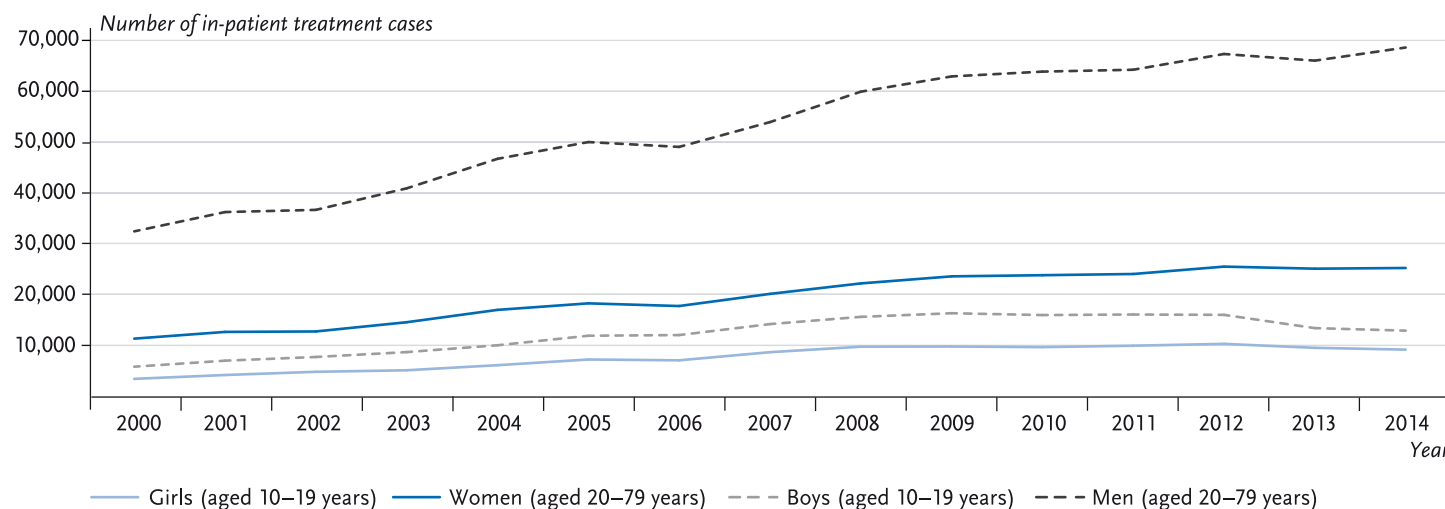
Age	Girls and women		Boys and men	
	Number of cases	Number of cases per 100,000 inhabitants	Number of cases	Number of cases per 100,000 inhabitants
10–14 years	1,767	97	1,173	61
15–19 years	7,487	380	11,802	566
20–29 years	5,967	126	13,455	270
30–39 years	4,121	85	11,682	237
40–49 years	5,814	97	16,310	266
50–59 years	5,492	88	16,917	269
60–69 years	2,465	52	7,260	165
70–79 years	1,401	30	2,854	74
Total	34,514	99	81,453	235

Table 1

In-patient treatment cases of alcohol intoxications (ICD-10 Code F10.0) by gender and age

Source: Hospital Diagnosis Statistics [12]

Fig. 1
Trend of in-patient treatment for alcohol
intoxications over time (ICD-10 Code F10.0)
by gender and age
 Source: Hospital Diagnosis Statistics [12]



Male persons were treated significantly more frequently than female persons in almost all age groups. Only in the category of 10 to 14-year-olds were more girls involved than boys.

alcohol intoxications was up by a total of 121% from the year 2000 to 2014, compared with 112% amongst men of the same age. In both genders, there has been an almost constant upward trend in the frequency of treatment cases since the beginning of the new millennium. Regional differences have also been observed. For instance, in 2014 the highest treatment rates were recorded in the Saarland region, in Saxony-Anhalt and Rhineland-Palatinate with 237, 210 and 206 cases per 100,000 inhabitants, respectively; in Hamburg, Berlin and Brandenburg, the lowest rates were recorded with 68, 85 and 124 cases per 100,000 inhabitants, respectively [12].

Alcohol poisonings mostly occur due to episodically excessive alcohol consumption, also referred to as binge drinking [1, 13]. This is defined as drinking 60 g or more of pure alcohol on a single occasion. In Germany, this corresponds to a volume of at least five **standard drinks**

at 12g of alcohol each [1]. The frequency of binge drinking (prevalence) in Germany is determined via various epidemiological surveys. A comparison of survey data with the data of the Hospital Diagnostic Statistics shows that the trends of a 30-day prevalence of binge drinking do not necessarily reflect the trends of in-patient treatment of acute alcohol intoxications. For instance, evaluations of the representative alcohol survey 2014 show that the 30-day prevalence of binge drinking amongst children and adolescents has declined considerably. From 2007 to 2012, the proportion of 12 to 17-year-olds in these figures halved, from 25.5% to 12.9% [14]. Amongst adults, in contrast, there is a slightly differentiated outcome. While the prevalence amongst 18 to 59-year-olds stagnated from the year 2000 to 2012, in the age group of 18 to 24-year-olds it increased significantly from 37.0% to 42.3%, and in the age group of 25 to 39-year-olds significantly from 28.6% to 31.9% [15]. Various reasons can be

From the year 2000 to 2014, the number of alcohol poisonings requiring in-patient treatment more than doubled in all age groups; however, a slight decline has been recorded since 2012 amongst 10 to 19-year-olds.

presented to explain these discrepancies. For one thing, it is possible that the frequency of regular binge drinking as such has declined, whereas selective excessive drinking giving rise to alcohol intoxications in need of treatment has risen. For another, methodological differences may play a part. As the Hospital Diagnosis Statistics are not evaluated in terms of persons but in a case-based manner, it is not possible to draw any conclusions regarding the number of times a certain patient has been taken to hospital, for instance. Multiple treatments of a single person for acute alcohol intoxication are therefore included as independent cases in the statistics. It cannot be ruled out either that changed coding habits of medical practitioners have contributed to the increase in the number of cases in recent years. Moreover, experts assume that part of the increase may be attributable to an increased perception of excessive alcohol abuse in public places and to an elevated readiness amongst the population to make emergency calls [16-18].

Analyses like the present one indicate that it remains necessary to prevent excessive alcohol consumption. In this context, a policy mix of behaviour-related and situation-based preventive measures is recommended [19, 20]. In Germany, for instance, this is used as part of the national health target "Reduce alcohol consumption", within the scope of the nationwide alcohol prevention project „HaLT – Hart am Limit“ (www.halt-projekt.de) as well as in various campaigns launched by the Federal Centre for Health Information (Bundeszentrale für gesundheitliche Aufklärung) [10, 21].

The implementation of measures should begin while children are still at a young age and in adolescence as

the attitudes and behavioural patterns in relation to alcohol predominantly develop at an earlier age and generally continue to prevail until adulthood [3].

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Robert Koch Institute, Berlin

Traffic accidents under the influence of alcohol

Abstract

In 2014, 260 persons were killed in Germany in road traffic accidents under the influence of alcohol. Compared to road traffic accidents in general, accidents under the influence of alcohol frequently have particularly serious consequences. In 2014, police established that 13,742 persons were involved in traffic accidents while under the influence of alcohol. Just under 40% of these were young men aged 18 to 34 years. The number of road traffic accidents under the influence of alcohol has been declining for over 20 years now and in 2014 reached its lowest level since the recording of the relevant data began.

📌 TRAFFIC ACCIDENTS · ALCOHOL · ADULTS · MEN · GERMANY

Introduction

High-risk, abusive and addictive consumption of alcoholic beverages entails huge risks to the health of consumers, may be harmful to third parties, has an impact on the social environment of the consumers and causes substantial costs on a macroeconomic scale [1]. Therefore, the prevention of alcohol-related consequences represents a key element of numerous public health strategies. The “Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013–2020” launched by the WHO calls for a relative reduction in high-risk alcohol consumption by 10% from the year 2010 to 2025 [2]. In Germany, the need to combat alcohol consumption and its consequences has been incorporated in the national health targets [3].

In Germany, a total of 260 persons were killed in road traffic accidents under the influence of alcohol in 2014. Alcohol-related accidents constitute a risk to life and health and are avoidable. In Germany, according to

Section 24a of the Road Traffic Act it is an offence for drivers to operate a motor vehicle with 0.25 mg/l or more of alcohol on their breath or a level of 0.5 parts per thousand of alcohol in their blood. Road users involved in a traffic accident are considered to be under the influence of alcohol even at lower alcohol values. A zero alcohol limit has been stipulated for learner drivers. Some European countries have lower alcohol limits and harsher penalties than Germany [4]. Controls and fines are key measures to prevent driving under the influence of alcohol and to reduce the number of alcohol-related traffic accidents. Furthermore, there are additional measures, such as those within the scope of the federal German Government’s road traffic safety work which it conducts jointly with numerous organisations in society. In its “Road Traffic Accident Prevention Report” (Unfallverhütungsbericht Straßenverkehr), the Federal Government provides information each year on measures in the field of accident prevention [5]. The focal points of

In 2014, 260 persons were killed in Germany in road traffic accidents under the influence of alcohol.

work in the field of alcohol prevention vary from time to time. In the current reporting period 2012/13, issues included the introduction of alcohol ignition locks (or alcohol interlocks) for rehabilitation of drivers who have come to the attention of the police, and these locks have proved to be helpful as part of the project. In addition, the Federal Government is involved in the EU project DRUID, which develops recommendations for identifying, punishing and rehabilitating drivers under the influence of psychoactive substances [5]. The Federal Centre for Health Information (Bundeszentrale für gesundheitliche Aufklärung) uses its campaign “Alcohol? Know your Limit” to address youths and young adults. Alcohol in road traffic is one of the topics dealt with on posters, on the campaign website and in video sequences [6]. The prevention programme P.A.R.T.Y. (“Prevent Alkohol and Risk Related Trauma in Youth”), calling for adolescents to spend a day in an accident clinic, the Internet database “Alcohol and Drugs in Road Traffic” (Alkohol und Drogen im Straßenverkehr) as well as various events and brochures for adults are coordinated and published by the German Traffic Safety Council (Deutscher Verkehrssicherheitsrat) [7].

This fact sheet provides a current overview of road traffic accidents under the influence of alcohol. The key contribution in the current edition of the Journal of Health Monitoring “[High-risk alcohol consumption by adults in Germany; prevalences and long-term trends](#)” examines information on alcohol consumption in Germany. Moreover, this edition contains fact sheets [on hospitalisations due to acute alcohol intoxication](#) and [on alcohol-related mortality](#).

Indicator

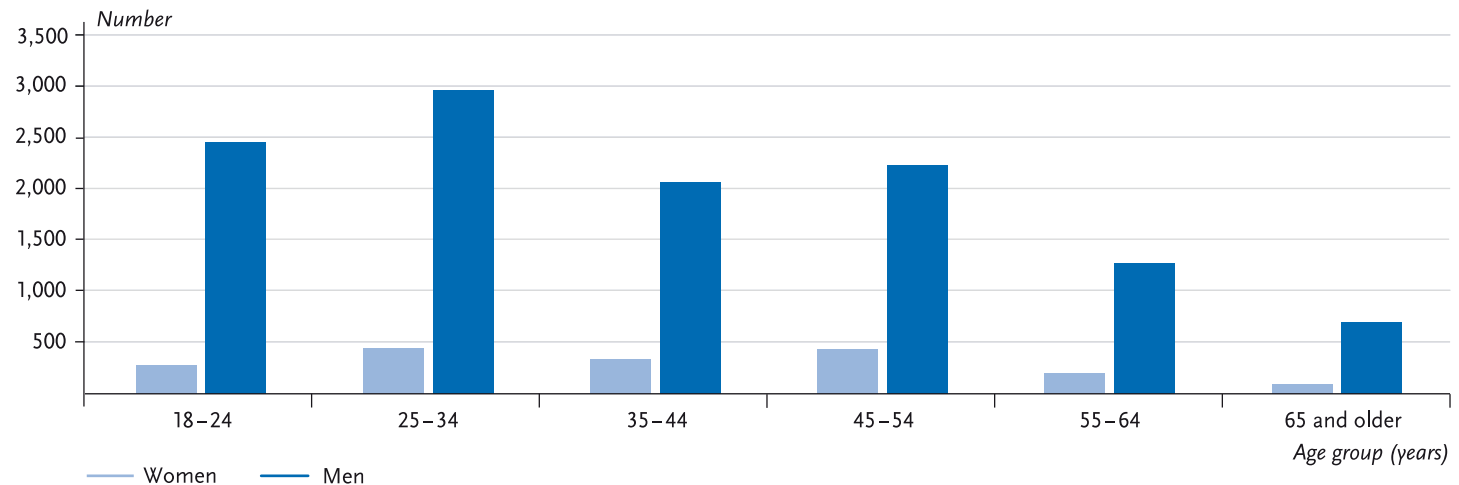
The analysis is based on data of the 2014 Road Traffic Accident Statistics of the Federal Statistical Office. Amongst the information contained in these statistics are details of accidents involving personal injury on German roads, in the course of which at least one party to the accident was under the influence of alcohol. Accidents where the police were not notified are not included in the statistics. “Parties” are all drivers of motor vehicles or pedestrians who sustained or caused injuries themselves or whose vehicles were damaged. Below is a presentation of how many persons were involved in alcohol-related road traffic accidents in 2014 and how the case numbers are distributed by gender and age. In supplementation, selected additional key features of alcohol-related accidents are described, including information on long-term developments.

Classification of findings

In 2014 there were 13,612 accidents involving personal injury in which at least one party to the accident was under the influence of alcohol [8]. In relation to the accident events, this means that alcohol was a cause in 4.5% of all cases involving personal injury. Of all terminal injuries 7.7 per cent were due to an accident caused to at least some extent by alcohol. The differing proportions are an indication of the above-average level of severity of accidents under the influence of alcohol.

Regionally there are substantial differences in the frequency of alcohol-related accidents: the lowest proportions of alcohol-related accidents involving personal injury were registered in Hamburg (3.1%) and Berlin

Fig. 1
Persons involved in alcohol-related
accidents by age group and gender
 Data basis: Road Traffic Accident Statistics
 Source: [8]



In 2014, police established that 13,742 persons were involved in traffic accidents while under the influence of alcohol. Just under 40% of these were young men aged 18 to 34 years.

(3.3%). The values recorded in the Saarland region (6.4%) and in Mecklenburg-West Pomerania (6.2%) were significantly higher than the federal average.

In focusing on prevention, evaluations regarding the persons involved in accidents are important. Which groups of persons were involved in accidents while under the influence of alcohol? In 2014, 13,742 persons under the influence of alcohol were involved in the accidents referred to above, of whom 86.8% were male. In particular, young men happen to be involved in traffic accidents involving drunkenness. Of all persons involved in accidents 40.2% were young men aged 18 to 34 years (Fig. 1). The number of drunken persons involved in accidents declines substantially for both genders from the age of 55.

An increased likelihood of men, especially young men, involved in accidents is also reflected in other results of the traffic accident statistics, e.g. in terms of the number

of deaths. In 2014, 34 young women per million inhabitants in their age group were killed; for men, this value was more than three times as high (123 men aged 18 to 24 years) [9]. This is confirmed in surveys including other areas of accident events: according to a current survey representative of the population as a whole regarding the accident events (all accident locations), 10.9% of all men and 6.6% of women sustained an accidental injury that had to be treated by medical practitioners at least once a year. Of young men aged 18 to 29 years, as many as 20% had an accident (19.4%) [10]. The higher risk of accidents in men is explained by riskier behaviour patterns, amongst other factors. This “risk-seeking” behaviour that is exhibited in particular by younger men is considered a key factor for explaining the pronounced gender-specific frequencies of accidents [11]. Differences in drinking patterns and in risk for men and women were also observed with regard to alcohol consumption [12].

The number of road traffic accidents under the influence of alcohol has been declining for over 20 years now and in 2014 reached its lowest level since the recording of the relevant data began.

This is reflected in all surveys carried out in this regard. In the German Health Interview and Examination Survey for Adults (DEGS1), it was established that 13.1% of women and 18.5% of men aged 18 to 79 years consume over 10g (women) and 20g (men) of pure alcohol. Accordingly, this reflects a tendency towards risky consumption that is significantly more frequent amongst men than women. Binge drinking also occurs considerably more frequently in men than in women [13, 14] (see also [focus](#) in this issue). Evidently this is where areas of masculine risk behaviour accumulate.

In addition to personal characteristics such as age and gender, other factors in connection with alcohol-related accidents also provide indications where prevention must begin. Passenger car drivers (56.6%), both male and female, account for the largest proportion of parties to alcohol accidents involving personal injury, while more than a quarter are cyclists (25.7%), again both male and female. Drivers of road haulage vehicles account for a very small proportion of alcohol accidents (2.5%). They are subject to absolute prohibition of alcohol when exercising their activities; they are at risk of frequent inspections [8]. Time also plays a part as far as accident risks are concerned: alcohol-induced accidents occur especially often on weekends. Saturdays and Sundays are the days of the week that are most prone to accidents, with a share of 23.9% and 22.6%, respectively. Evaluations of the times of day show that alcohol-related accidents chiefly occur in the evenings and nights; this means that of all night-time accidents that occur between 22:00h and 06:00h, alcohol played a part in every fourth case (24.4%) [8].

A positive trend is discernible regarding the long-term development of traffic accidents under the influence of alcohol ([Figs. 2a, b](#)). The number has been declining for over 20 years now; in 2014 it reached the lowest level since the recording of the data began. This also applies to traffic accidents in general: the number of traffic casualties in 2014 was at the lowest point since the introduction of the official statistics. At present, accidents merit attention where these occur under the influence of intoxicating substances such as drugs and narcotics. In this respect an increase has been observed since the early 1990s, even though the case numbers are low. It is assumed that the estimated number of unreported or undetected cases is high in this field, as is the case with alcohol-related accidents [8]. Despite declining accident numbers, the improvement in traffic safety remains a task for society as a whole. The German Traffic Safety Council (Deutscher Verkehrssicherheitsrat – DVR) endorses the “Vision Zero” strategy: safe mobility in Germany, with no deaths and serious injuries in road traffic [15]. It also endorses a general prohibition of alcohol for drivers [16].

Fig. 2a
Number of road traffic accidents in the past 20 years (1995–2014)
 Data basis: Road Traffic Accident Statistics
 Source: [17]

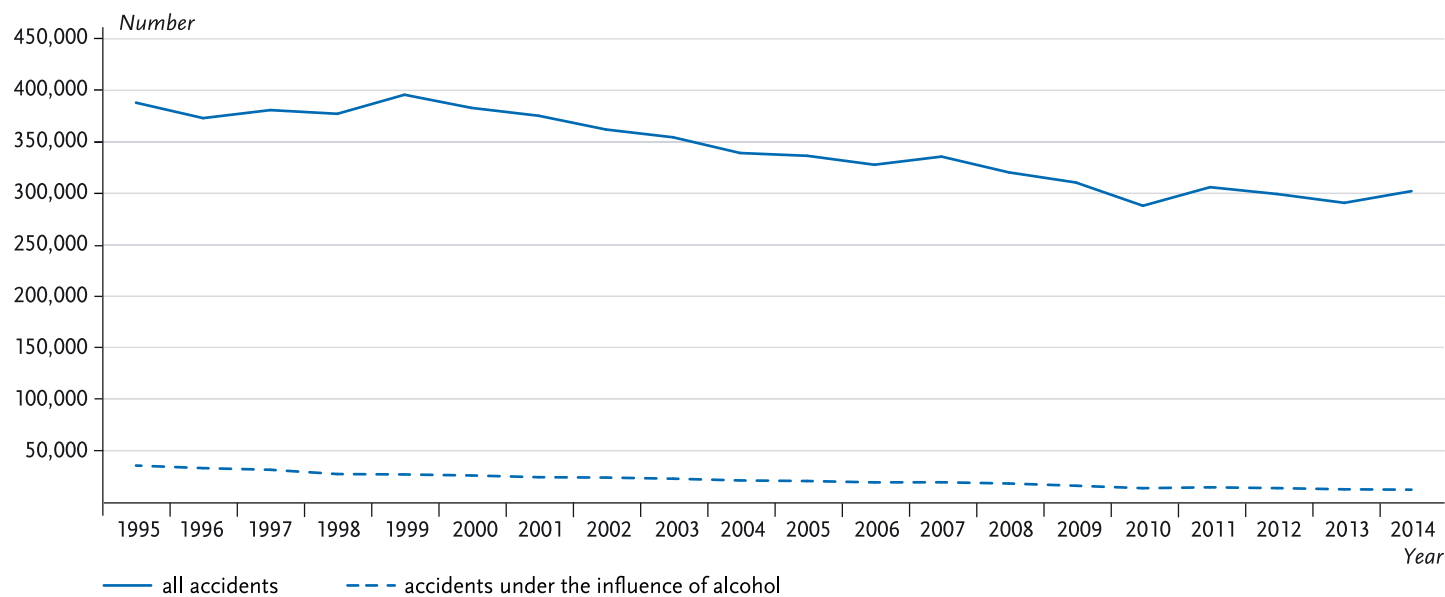
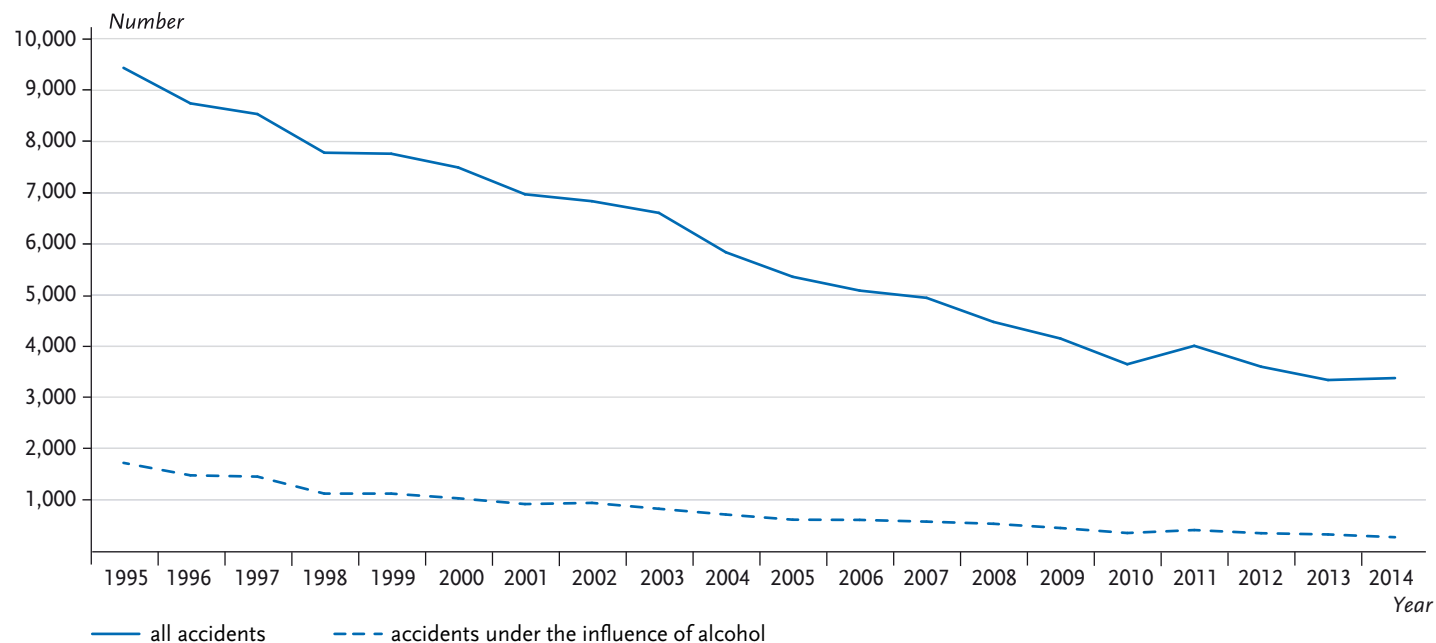


Fig. 2b
Number of persons killed in road traffic accidents in the past 20 years (1995–2014)
 Data basis: Road Traffic Accident Statistics
 Source: [17]



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Alcohol-related mortality among adults

Abstract

Risky, abusive and addictive consumption of alcoholic beverages greatly jeopardizes the drinker's health; it can harm third parties, affects the drinker's social relations and causes considerable costs to the national economy. National and international campaigns therefore aim to lower alcohol consumption and its consequences. Alcohol-related mortality is the most serious outcome of excessive alcohol consumption. Official statistics on causes of death include a number of entirely alcohol-related diagnoses. In 2014 an examination of deceased adults in Germany revealed a directly alcohol-related cause of death in 14,095 cases (20.8 for every 100,000 inhabitants). Such diagnoses were considerably more frequent for men than women, reaching a peak in the 55 to 64 age group. Overall, death from alcohol abuse is declining in Germany. Because by international standards there is still a relatively high consumption of alcoholic beverages in Germany, more action needs to be taken.

ALCOHOL DEPENDENCY · ALCOHOL ABUSE · MORTALITY · ADULTS

Introduction

Risky, abusive and addictive consumption of alcoholic beverages greatly jeopardizes the drinker's health; it can harm third parties, affects social relations and causes considerable costs to the national economy [1]. The prevention of alcohol-related problems is thus an important part of many public health strategies. The WHO's "Global action plan for the prevention and control of non-communicable diseases 2013-2020" calls for a relative reduction of high-risk alcohol consumption by 10% between the years 2010 and 2025 [2]. In Germany the battle against alcohol consumption and its consequences has been included in the list of National Health Objectives. Here too the aim is to lower the amount of alcohol consumed by Germans [3].

The permanent monitoring of key indicators is vital in order to estimate the extent to which the objectives have

been attained. Accordingly, the World Health Organization (WHO) proposes a campaign to measure the per capita consumption of pure alcohol, the prevalence of severe binge-drinking and alcohol-related morbidity and mortality, which would be taken as key indicators; it also recommends expanding this list to fit the national context. In this edition of the Journal of Health Monitoring information is provided about risky alcohol consumption and per capita intake in the Focus [Alcohol consumption of adults in Germany: Harmful drinking quantities](#), consequences and measures. There are also Fact sheets on [Cases of alcohol poisoning involving in-patient treatment](#) and [Traffic accidents under the influence of alcohol](#). This Fact sheet complements the information contained in the aforesaid with details of alcohol-related mortality - the most severe result of excessive alcohol consumption.

In 2014, 14,095 adults died from a directly alcohol-related disease.

Indicator

The indicators on fatalities are taken from the cause of death statistics, which represent a complete annual record of all deaths in Germany. This is based on the doctors' death certificates listing the diseases which have led to the person's death. In accordance with the WHO code the cause of death statistics follows a monocausal approach i.e. only the underlying illness is extracted from the entries in the death certificate for inclusion in the statistics. Since January 1st, 1998, the 10th Revision of the "International Statistical Classification of Diseases and Related Health Problems" (ICD-10) has been applied when preparing the official cause of death statistics. To determine the alcohol-related deaths, reference is made to a list of diseases caused in their entirety by alcohol [4]. The diagnoses F10 (mental and behavioural disorders due to alcohol) and K70 (alcoholic liver disease) are identified as responsible for more than 90% of these directly alcohol-related deaths and will be shown separately in the following [5, 6]. Causes of death such as cardiovascular disease or cancers which may

have been developed in large part due to excessive consumption of alcohol are not included in the following analyses. Only those deaths caused entirely by alcohol are analysed by age, gender and year. The overall mortality attributable to alcohol is thus underestimated. The report encompasses absolute numbers of deaths and deaths per 100,000 of the population over the age of 18. Age standardized figures for comparisons over time are compiled using the "old" European Standard Population and relate to all age groups from the age of 0 years.

Classification of findings

In 2014, the cause of death for a total of 14,095 adults in Germany was ascertained to be an entirely alcohol-related disease. Thus 20.8 of 100,000 inhabitants over the age of 18 died of a disease directly associated with the consumption of alcohol. Considerably more men than women die of causes attributable to alcohol (Table 1). Men thus account for almost three quarters of such deaths.

Table 1
Alcohol-related mortality among Adults
in 2014 (≥age 18)
Source: Cause of death statistics [6]

		Deaths	Deaths per 100,000 inhabitants (raw data)
K70 Alcoholic liver disease	Total	7,864	11.6
	Women	2,256	6.5
	Men	5,608	17.0
F10 Mental and behavioural disorders due to alcohol	Total	5,113	7.5
	Women	1,192	3.4
	Men	3,921	11.9
Entirely alcohol-related deaths (all diseases)	Total	14,095	20.8
	Women	3,672	10.5
	Men	10,423	31.6

Men account for about three quarters of all deaths directly attributable to alcohol.

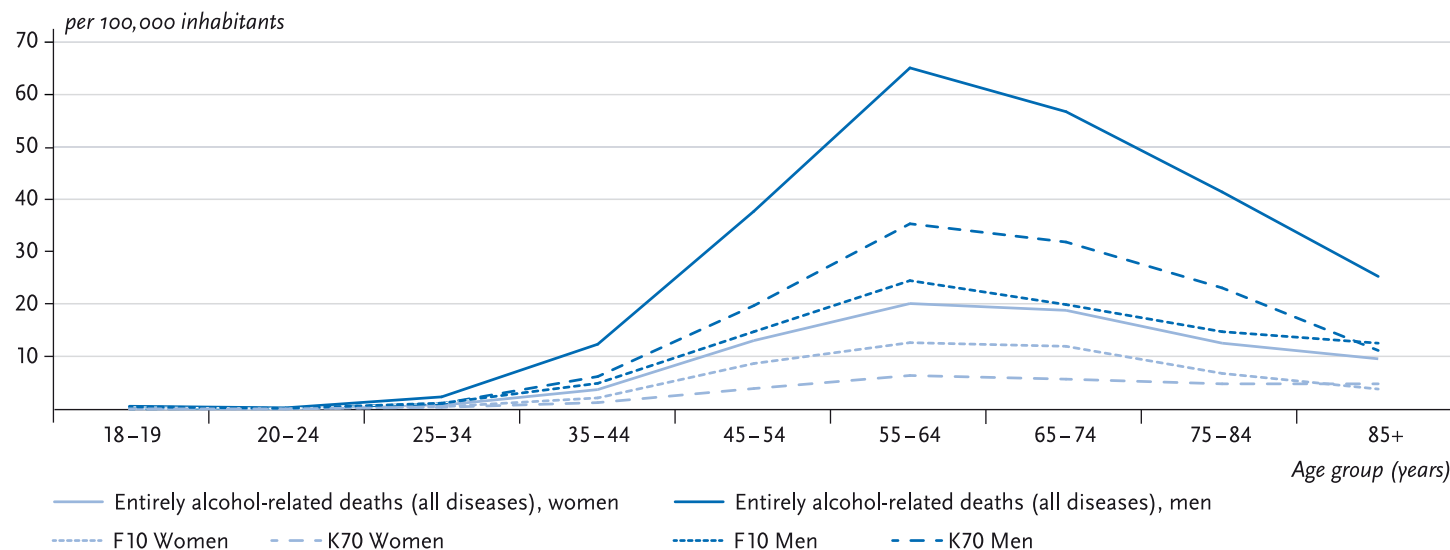
In regional terms, the prevalence of alcohol-related mortality is well above average in the “new” eastern Länder and in Bremen [6]. Moreover, mortality due to alcohol-induced disorders strongly correlates with age. Overall, and in terms of the major specific diagnoses, a notable rise in deaths first occurs in the 35 to 44 age group. Thereafter directly alcohol-related mortality increases sharply until it reaches a peak in the age group 55 to 64. Here the alcohol-related mortality is 20.2 per 100,000 inhabitants for women and 65.4 per 100,000 inhabitants for men. Thus, in parallel with the increased mortality due to age, the gender gap to the disadvantage of men successively evolves with advancing age. In the younger age groups it is seen that there is little difference between men and women in terms of alcohol-related mortality (Fig. 1).

The gender-specific distribution of alcohol-related causes of death is mirrored in the patterns of consumption that become established in early adulthood: Risky drinking behaviour and binge drinking are appreciably more prevalent among men than women [7, 8] (Focus). With increasing age, some consumption patterns such as binge drinking decline among both genders [7], but some people display a chronic pattern of alcohol abuse. The comparatively high alcohol-related mortality seen in middle age is thus due to the fact that these people have accumulated risks for disease and death over a longer period of their lives.

Similarly, the regional differences in alcohol-related mortality correspond with differing patterns of consumption: since the fall of the Wall and up to this day, alcohol consumption in the “new” Länder has been

Fig. 1

Alcohol-related mortality among adults by age, 2014 (deaths per 100,000 inhabitants)
Source: Cause of death statistics [6]



Starting in the 35 to 44 age group alcohol-related mortality increases sharply until it reaches a peak in the age group 55 to 64.

higher than that in the “old” Länder. However, barely any difference is now ascertainable in the youth and young adult age groups [9]. There is therefore reason to hope that the trend towards a lessening of the east-west divide in alcohol-related mortality rates will continue [6].

Over the course of time there has been a decline in entirely alcohol-related mortality in Germany [6]. In respect of all age groups (from 0 years) the age standardized rates for men have fallen from 29.1 deaths per 100,000 inhabitants in 1998 to 20.1 in 2014. Starting from a lower base, the figures for women showed a slower decline from 9.0 deaths to 6.5 per 100,000.

The decline in alcohol-related mortality over time matches patterns of lower consumption: various studies come to the same conclusion that over the last thirty years the proportion of people who drink dangerous amounts of alcohol has fallen [10] (*Focus*). Fundamentally, therefore, there are positive developments in Germany that mark progress towards the national and international targets. Since, however, Germany still falls into the one quarter of OECD member states registering the highest per capita consumption of alcohol, and its consumption is also relatively high in global terms, action is still required [11, 12]. Possible approaches range from steps to provide information and education that appeal directly to the consumers, to structural measures, by taking a closer look at advertising for alcoholic drinks, pricing policies and the availability of alcohol (*Focus*). Programmes offered by addiction care services are very important aids to avoiding alcohol-induced mortality, as they help recognize and treat alcohol dependency in time. Since alcohol consumption and

alcohol-related mortality are phenomena that manifest disproportionately in men, prevention and therapy need to take a gender sensitive approach in order to make an adequate response to the specific behavioural patterns of men and women [13].

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