

# Assessment of moderate wine consumption and alcohol abuse from the perspective of German and Hungarian consumers

Wine consumption and alcohol abuse

Gergely Szolnoki

*Department of Wine and Beverage Business Research, Geisenheim University,  
Geisenheim, Germany*

Stylianos Filopoulos

*European Society of Association Executives, Brussels, Belgium*

Claudia Stein-Hammer

*Deutsche Weinakademie, Bodenheim, Germany, and*

David Brazsil

*National Council of the Wine Communities, Budapest, Hungary*

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## Abstract

**Purpose** – The health effects of alcoholic beverages and the differentiation between moderate consumption and alcohol abuse are discussed controversially in medicine, sociology and politics. Therefore, this paper aims to analyse how consumers assess the relation among health, wine consumption and alcohol abuse.

**Design/methodology/approach** – A representative survey in Germany and in Hungary was conducted with 2,000 and 1,500 respondents, respectively. The survey included questions regarding the assessment and definition of alcohol abuse and moderate wine consumption.

**Findings** – The results show that in Hungary, moderate wine consumption is defined similarly as in Germany; on the contrary, in the case of alcohol abuse, there are significant differences. Regardless of cultural background, the respondents agreed that excessive wine consumption harms health and certain consumer groups (pregnant women or people under 16 years old) should avoid drinking wine.

**Practical implications** – These findings can contribute to a long-term goal-oriented wine in moderation strategy for consumers and support policy advice on moderate and excessive wine consumption.

**Originality/value** – The results help to understand how consumers perceive moderate and excessive wine consumption in everyday life, and how they judge wine as an alcoholic beverage. To the best of authors' knowledge, there has not been similar study published on the perceptions of wine consumers in this regard, neither in Germany nor in Hungary.

**Keywords** Germany, Hungary, Alcohol abuse, Survey research, Wine, Moderate wine consumption

**Paper type** Research paper



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## 1. Introduction

According to the World Health Organisation (WHO), the total alcohol per capita consumption has increased globally from 2005 (5.7 l) to 2010 (6.4 l) after a relatively stable phase between 2000 and 2005 (WHO, 2018). Between 2010 and 2016, the total per capita consumption remained stable at 6.4 l. Nonetheless, in the European Region (the region includes 53 countries among them; EU members states, San Marino, Tajikistan, Russian Federation, etc.) alcohol consumption decreased from 12.3 litres in 2005 to 9.8 litres in 2016 (WHO, 2018).

Worldwide as well as in all WHO regions, there have been only minor changes in beverage preferences since 2010. Geographical differences exist regarding the type of alcohol people consume – beer, wine, spirits or other alcoholic beverages. Only 11.7% of total recorded alcohol is consumed in the form of wine. However, alcohol consumption in the form of wine has significant differences between the various WHO regions, it can be as low as 1.9% of total consumption in the WHO South-East Asia Region (SEAR) and more than one-fourth of total consumption in the WHO European Region (29.8%). The largest changes from 2010 to 2016 took place in European Region, where the share of total recorded consumption of spirits decreased by 3% (from 30.2% to 27.2%), whereas wine increased (from 27.6% to 29.8%) as did beer (from 38.4% to 40.0%) (WHO, 2018).

The consumption of alcoholic drinks as a “glass” of wine with dinner or a “beer in the evening” with friends, is part of everyday life for many people. The health effects of alcoholic beverages – and in this context, the differentiation between moderate consumption and alcohol abuse – are controversially discussed in medicine, sociology and politics.

There is no single international standard for safe or unsafe alcohol drinking levels (OIV, 2019). A uniform set of internationally applicable guidelines on alcohol consumption does not exist, neither does a common international definition of drinking units or standard drink, adding complexity around the controversial topic of what is moderate consumption and what is alcohol abuse. Some institutions increasingly emphasise the negative aspects of even small amounts of alcohol on health and generally demand lower guidance levels for alcohol than those established in many countries (Wood, 2018; WHO, 2010).

The impact of wine on health should not be seen in isolation but in a holistic approach as part of drinking patterns and overall lifestyle. A healthy lifestyle is a combination of different practices and habits (Filopoulos, 2020). The drinking pattern plays an important role: it does matter whether 30 g of alcohol is consumed in the form of wine combined with a meal, or in the form of spirits without a meal (Gea, 2014; Boban, 2016). Some positive health-related consequences of the consumption of alcohol with meals have been investigated: hypoglycaemic and insulin-lowering effects, reduced postprandial blood pressure among hypertensive patients, or a reduction in low-density lipoprotein susceptibility to lipid peroxidation (Foppa *et al.*, 2002; Hätkönen *et al.*, 2012).

Although countries with above-average GDP generally have higher levels of alcohol consumption, this does not imply that most alcohol-related harms and high-risk drinking habits occur in these countries (WHO, 2014). The fact that socio-economic status influences alcohol consumption across Europe is no longer in doubt (Katikireddi *et al.*, 2017). At the same time, the willingness to consume wine is fundamentally not dependent on socio-demographic factors. It can be said that wine is widely accepted by the population as a drink. However, when comparing the consumption intensity of wine drinkers, it becomes clear that income, education and age have a significant impact on the amount consumed, at least in Germany (Szolnoki and Hoffmann, 2014).

The main purpose of this paper is to investigate how consumers from two European countries assess moderate and excessive wine consumption and how much wine they

consume on average. We also study the relationship between alcohol as well as wine consumption and health-related issues. Generally, alcohol consumption has become a topic of great importance and policies that supposed to regulate alcohol consumption are planned or have been already implemented in certain countries. To get deeper and profound insides into the world of alcoholic beverages and the role of wine consumption, these findings serve a scientific base. As only a few scientific papers have dealt with this topic, this study provides information both for scientific purposes and the industry. These results should contribute to a long-term strategy of wine in moderation and support policy advice on moderate and excessive wine consumption.

The two selected countries (Germany and Hungary) represent two different worlds. Because of the completely different development of these two countries after the Second World War, both on the political and on the economic level, there is a certain scientific interest in investigating wine and health-related questions with various cultural backgrounds. As a Central-Eastern-European country, Hungary represents the door from the Balkan to Western Europe with a robust historical effect of the past 60–70 years – Hungary had been, after the Second World War, one of the communistic countries until 1989. Germany is an economic centrum in Western Europe, which underwent a strong cultural and financial development in the past six decades. We suppose that differences in culture, economy and politics also have their influence on wine consumption behaviour and on evaluating moderate wine drinking and alcohol abuse. Germany has become, in the past 20 years, the most important marketplace worldwide in terms of imported wine volume with an annual per capita consumption of 24.2 litres of still and sparkling wine. Hungary also belongs to the “old world” heritage countries with a 1,000-year winemaking tradition. Unlike Germany, wines by domestic winemakers dominate the Hungarian wine market. The current per capita consumption is 24.0 litres, which shows a decreasing tendency since 2010 ([Szolnoki and Totth, 2020](#)).

## 2. Literature overview

### 2.1 Alcohol and health policies and drinking guidelines

Societies throughout history have developed social norms and enforce regulation to control the negative effects of alcohol abuse. Since 2010, when the Global strategy to reduce the harmful use of alcohol was released ([WHO, 2010](#)), many countries have developed national policies and others have revised their policies to address the international recommendations. These national policies and strategies are also looking to address voluntary targets like the one defined in the Global Monitoring Framework Non-Communicable Diseases (NCDs) to aim at least 10% relative reduction of the harmful use of alcohol 2025. Another example is the sub-category 3.5 of the 2030 Sustainable Development Goal “Good Health and Well-Being”, formulated as follows: “Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse *harmful use of alcohol*”. All these measurable targets increase the pressure for tangible, impactful and measurable action by United Nation (UN) Member States and stakeholders ([Filopoulos, 2020](#)).

Measures are looking to increase the perception of risk among the population through raising awareness, social norming, social marketing and labelling. Many countries have also created a much stricter regulatory environment for the sales, communication and consumption of alcoholic beverages by limiting exposure and availability and by restricted commercial communication and pricing policies (including taxes, promotions, minimum prices) ([WHO, 2018](#)). Since 2017, in parallel to the rising restrictive political environment, an increasingly biased and often misleading communication over the impact of alcoholic

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beverage is observed ([Fradera and Stein-Hammer, 2019](#)), challenging sound scientific knowledge.

Official guidelines on alcohol consumption are usually produced by a government, public health body, medical association or inter-governmental organisation, such as WHO to advise on levels of alcohol consumption ([OIV, 2019](#)). National governments set low-risk drinking guidelines to minimise potential harm to human health such as the [Chief Medical Officer \(2019\)](#) in the UK and the [Centers for Disease Control and Prevention \(2019\)](#) in the USA. Approximately 64 of the 194 member countries of the WHO have alcohol drinking recommendations. Some governments make recommendations for daily and/or weekly intakes. While the recommendation on drinking level is relatively consistent, being approximately 20 g alcohol/day for both men and women in several countries, there are some extreme low and high recommendations ranging from 8 g alcohol/day to 40 g alcohol day ([OIV, 2019](#)).

Since 2013, there has been a trend towards changes in the guidelines in different countries:

- lower recommendations for women and men (g alcohol/day);
- different thresholds for different age groups (youth, young adults, adults over 64);
- daily rather than weekly limits (or both);
- abstinence recommendations for two days a week; and
- definitions for low, moderate and risky alcohol consumption.

Despite partly contradictory scientific results, there is an increasing requirement for lower guideline values for alcohol than defined in several countries.

Italy, for example, introduced in 2014 a new policy that marked a drastic change compared to the former policy from 2003. Ethanol was first described as a toxic, carcinogenic and psychoactive substance for which there is no recommendations. Low-risk consumption was defined as only one standard drink (SD) for women and maximal two standard drinks for men. In addition, there was no moderate, risk-free alcohol consumption, but only consumption with low risk. The drinking guidelines shifted from potentially positive aspects to potentially harmful ones ([SINU, 2014](#)). This new approach is expected to be reflected in many policies.

## *2.2 Standard drink*

Not only the drinking guidelines vary from country to country, so does the definition of a SD. The [WHO \(2014\)](#) defines a SD as “a volume of beverage alcohol (e.g. a glass of wine, a can of beer, or a mixed drink containing distilled spirits) that contains approximately the same amounts (in grams) of ethanol regardless of the type of beverage”. As different alcoholic beverages contain different amounts of alcohol, the question of a SD is becoming more and more important, to achieve comparability between alcoholic beverages. Official SDs or “units” generally contain between 8 and 20 grams of pure ethanol although the measure varies among countries as there is no consensus internationally on a single SD size ([OIV, 2019](#)).

With both drinking guidelines and definition of SD varying significantly it is difficult to achieve comparability between different national low-risk drinking guidelines and low-risk consumption patterns.

## *2.3 Wine consumption and health*

Wine and health is a frequently discussed, ambivalent topic. While for centuries, wine has been used as a natural remedy and medicine, its abusive consumption has always been

condemned. Scientifically, it has been proven several times that the effects follow a so-called J-curve: low to moderate wine consumption might have health benefits, but from a certain dose, it is undoubtedly harmful to health ([de Gaetano and Costanzo, 2017](#)).

According to [Guilford and Pezzuto \(2011\)](#), as well as [Flamini et al. \(2013\)](#), polyphenols in wine are supposed to have a positive health impact thanks to their antioxidant effect and their direct action on cellular lipid homeostasis ([Vecchio et al., 2017](#)). Low-to-moderate consumption has protective effects against the following diseases:

- cardiovascular diseases ([Brien et al., 2011; McCambridge and Hartwell, 2014; O'Keefe et al., 2014; Flesch et al., 2016; Bell et al., 2017; Colpani et al., 2018; Wood et al., 2018](#));
- neurodegenerative diseases ([Letenneur, 2004; Pinder and Sandler, 2004](#));
- Type 2 diabetes mellitus ([Knott et al., 2015; Cai et al., 2016; Hirst et al., 2016; Holst, 2017; Zhang, 2017](#));
- different cancer types ([Bianchini and Vainio, 2003; Kamholz, 2006; Chao, 2007; Kubo et al., 2009](#)); and
- Age-related dementia ([Neafsey and Collins, 2011; Weyerer et al., 2011; Xu et al., 2017](#)).

In spite of several studies with positive impacts of light to moderate alcohol drink consumption, especially in the form of wine, the abuse of alcoholic beverages harms health and has negative social and economic consequences. [Tomera \(1999\)](#) warned in his study against the negative effects of excessive alcohol consumption, such as liver cirrhosis, physical risk of drunk driving, alcoholism, violence and socialisation issues. The [Wine Information Council \(2016\)](#) quoted several studies that have analysed the negative effects of alcohol on different cancer types and embryos' malformation during pregnancy (alcoholic embryopathy).

#### *2.4 Low risk and moderate consumption*

In accordance with the [WHO \(2001\)](#), low risk includes limited alcohol absorption that makes it unlikely to harm consumers themselves and others. Moderation really refers to consumption, that is, the amount of alcohol that an individual can consume without significantly increasing their risk of negative consequences or harm ([Dufour, 1999](#)), to both health and society ([OIV, 2019](#)). [Joshua's \(2017\)](#) scientific data showed that the risk increases noticeably if more than two drinks per day are consumed ([Grant, 1994; Joshua, 2017](#)).

The fact that men and women metabolise alcohol at different rates is reflected in many guidelines. Most, but not all, recommendations consider women to consume 50%–75% of the amount suitable for men.

According to the WHO, alcoholic drinks should not be consumed:

- when driving or driving machinery;
- while pregnancy or lactating;
- together with certain medications; and
- in case of problems with alcohol.

#### *2.5 Alcohol consumption and abuse in Germany and Hungary*

Germany is associated as a typical Western European state with a wealthy status, while Hungary bridges Europe and the Balkans. These two countries, therefore, represent different

cultural and social backgrounds within the European Union. Despite their differences, these two countries have a comparable per capita alcohol consumption: 11.81 of pure alcohol in Germany and 13.31 in Hungary. Besides, the wine consumption per capita is in both countries around 24 l. Based on the (WHO) Country Reports (WHO, 2018), it is observed in both countries a steady decrease of recorded total alcohol per capita (15+) consumption (Figures 1 and 2). Germany turning point started around 1980s, while in Hungary, the decrease in the total alcohol per capita (15+) consumption started later in the 1990s.

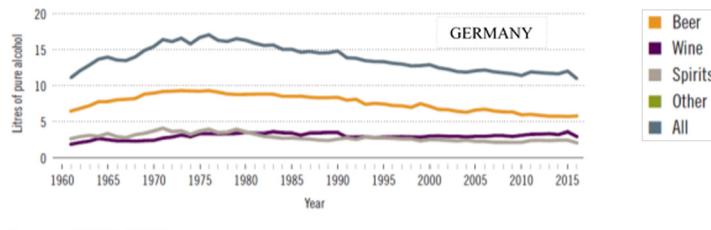
Based on the Country Reports (WHO, 2014), the 2010 Germany drinking pattern was rated in scale from one to five (with one least risky and five most risky) as one, while Hungary for the same period was rated as three. For the same year, the prevalence of heavy episodic drinking (HED) for drinkers in Germany was 23.6% among men and 7.6% among women and in Hungary 52.1% among men and 13.2% for women, almost double from Germany. HED is an indicator of the pattern of alcohol consumption defined as 60 or more grams of pure alcohol on at least one single occasion at least once per month (WHO, 2014). The level of alcohol consumption in Hungary is twice the global average but in line with the rest of Eastern European countries.

In Germany, depending on the institution, the daily dose of moderate alcohol consumption is defined as follows: women 12–14 g and for men twice as much. In Hungary, it is 17 g (woman) and 34 g (men) alcohol.

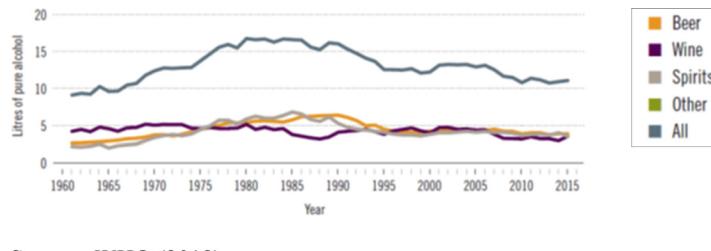
The number of alcohol-dependent persons in Germany varies. According to Terpe (2014), in 2012, the number of alcoholics in Germany increased to 1.8 million. Every year, about 15,000 people in Germany die because of high alcohol consumption. In addition, a survey conducted by the Institute for Therapy Research (Munich) revealed that too many people under the age of 25 still consume alcoholic beverages in a way that increases the risk of a manifested addictive disorder in adulthood (Tauner, 2014).

A new study on tobacco and alcohol consumption by young people in Germany (15,023 participants) showed that more than half of the 17-year-old population (51 %) have ever

**Figure 1.**  
Germany recorded total alcohol per capita (15+) consumption, 1961–2016



**Figure 2.**  
Hungary recorded total alcohol per capita (15+) consumption, 1961–2016



drunk alcohol. Around 12% of them practise risky alcohol consumption, while 7% reported regular binge drinking. However, the share of the two latter groups (high-risk alcohol consumption and regular binge drinking) decreased significantly in the survey period 2014–2017, compared to 2009–2012. This points out the success of preventive programs in Germany, such as “Youth protection active” initiated by the spirit industry or “Know Your Limit” by the Federal Centre for Health Education ([Moor et al., 2020](#)).

### *2.6 Research objectives*

As already mentioned in the first chapter, the results of different studies regarding alcohol consumption and health are controversially discussed worldwide. This study, however, does not aim to confirm or to reject these results, in fact, it attempts to analyse the evaluation of drinking wine from consumers' point of view and to find out how German and Hungarian wine consumers assess the relationship between health, wine consumption and alcohol abuse.

To our knowledge, there has not been a comparative study, which investigated the assessment of moderate wine consumption and alcohol abuse from the perspective of German and Hungarian consumers.

Based on the literature review and on the assumption that Hungarian and German wine consumers differ significantly, we operated with two main research questions:

*RQ1. How do German and Hungarian consumers assess moderate and excessive wine consumption?*

*RQ2. How do German and Hungarian consumers evaluate the image of wine and alcohol consumption regarding health issues?*

## **3. Material and methods**

To collect comparable and reliable data, we conducted, similar to [Szolnoki and Totth \(2020\)](#), representative consumer surveys in May 2018 in Germany and Hungary. The random sampling of 2,000 participants in Germany and 1,500 in Hungary is representative of the basic socio-demographic structure of the German population from age 16 and of the Hungarian population from age 18 (the legal drinking in these countries differs). Because of the different size of the population, we operated with a smaller sample in Hungary. By using a representative sample, the provided information could be generalised for the total population of each country. To increase the validity and reliability of the results, the survey was carried out in the form of a personal interview (face-to-face survey) in the households of the interviewees by using quota sampling ([Szolnoki and Hoffmann, 2013](#)). A professional market research company, GfK (Nürnberg, Budapest), conducted the data collection. Official statistics from Federal Office of Statistics on national level ([Statistisches Bundesamt, 2018](#); [Közponți Statisztikai Hivatal, 2018](#)) such as gender, age, occupation, region, size of household, size of the town/city were used for quotas. The external employees of GfK used a structured questionnaire and had to follow the question formulation as well as the order of the questions.

The questionnaire, based on the study by [Szolnoki and Hoffmann \(2014\)](#), included beside the socio-demographic also behavioural issues. According to this and the study by [Ramful and Zhao \(2008\)](#), consumption frequency of still and sparkling wine, as well as of beer was measured by using six frequency categories. For the place of consumption, we used constant sum scaling ([Malhotra and Birks, 2007](#)). To find out how German and Hungarian consumers define moderate or excessive wine consumption, two self-assessment questions were asked:

"Up to how many glasses of wine would you consider to be a 'moderate' amount to drink?" and "At what point (amount of glasses) do you think wine consumption becomes excessive?" The question also defined the size of the glass, as well as the alcohol level of wine – a glass of 200 ml of a wine at 13% vol. Alc.

Considering the results of [Friedman and Amoo \(1999\)](#) study on rating scales, the questionnaire used a seven-point interval scale for gauging the statements regarding alcohol consumption and health issues. For the socio-demographical variables gender and age, we applied the same response categories in both countries.

The questionnaire was designed in German and back translated (German–Hungarian) so that the native language of each country was used during data collection.

Data from the survey were analysed with SPSS 24.0 (IBM) using mean, frequency, cross tables and ANOVA. Like [Mueller et al. \(2011\)](#), we used the  $\chi^2$  test as an ordinal penetration measure to test the differences between the countries and behavioural variables combined with Cramer's V for cases with more than four cells ([Field, 2005](#)). For metric responses, factorial analysis of variance was used and post-hoc effects (Tukey-b test) were estimated, allowing analysis of the significant differences between the segments.

#### 4. Results and discussion

##### 4.1 Consumption frequency of various alcoholic beverages

First, the consumption frequency of three alcoholic beverage types (still wine, sparkling wine and beer) was determined, to provide preliminary insight into differences between German and Hungarian consumer behaviour. [Table 1](#) shows that there were significant consumption differences in all three beverage types. These consumption patterns reflect that in Hungary, there is a higher share of frequent wine drinkers (those who drink at least once per week wine; 22% vs 12%), and in Germany, there are more non-wine drinkers than in Hungary.

Germany's annual per-capita sparkling wine consumption is number one in the world, with a value of 3.41 ([Deutsches Weininstitut, 2020](#)). In Hungary, sparkling wine is also popular; however, the drinking frequency is lower than in Germany.

Beer consumption in Germany exceeds that of Hungary; comparing frequent beer drinkers, 45% of the German population consumes beer at least once a week, while in

	Still wine Germany n = 2,000	Still wine Hungary n = 1,500	Sparkling wine Germany n = 2,000	Sparkling wine Hungary n = 1,500	Beer Germany n = 2,000	Beer Hungary n = 1,500
Several times per week (%)	6	11	1	0	28	13
Once a week (%)	8	11	3	1	17	11
Two or three times per month (%)	13	14	9	3	11	15
Once a month (%)	10	12	12	6	6	8
Less than once per month (%)	24	19	49	54	13	19
Never (%)	39	33	27	37	25	35
Chi-square	68.421*		144.739*		177.311*	
Cramer-V	0.198		0.284		0.302	

**Table 1.**  
Consumption frequency of selected alcoholic beverages in Germany and Hungary

**Notes:** \*Significant differences between Germany and Hungary;  $\chi^2 = p < 0.05$

Hungary, this share is only 24%. These results already reflect fundamental differences in consumption of alcoholic beverages and show the general importance of wine and beer in Hungary and Germany.

Age seems to be one of the significant indicators when it comes to drinking frequency. The share of younger generation consuming wine is much higher in Hungary than in Germany. Unlike this, the consumption frequency is reversed for the oldest generation, as more German consumers over 65 years drink wine than their Hungarian counterparts. The drinking habits of consumers aged 40–65 years are similar in both countries. In terms of social settings, we also analysed the place of consumption, which provides insights about wine-drinking habits. Interestingly, there is a similar structure in German and in Hungarian regarding how much wine is consumed at events out-of-home and when visiting relatives or friends. Significant difference occurs when comparing the consumption at home and in the gastronomy – Germans have a higher share of wine in restaurants, while Hungarians consume more wine at home. Combining age and the place of consumption, we can conclude that wine consumption increases in the segments of older people. According to this, younger consumers, both in Germany and in Hungary, drink proportionally more wine at events and at visits ([Table 2](#)).

#### *4.2 Moderate and excessive wine consumption*

To answer *RQ1*, a cross-country segmentation approach using gender, age and consumption frequency was applied. As [Table 3](#) shows, the results of moderate consumption differ significantly between countries and between wine drinkers and non-wine drinkers. In general, Hungarians set a higher limit on both moderate and excessive alcohol consumption than Germans. Taking into consideration all participants of the surveys – the total population that contains both non-wine drinkers and wine drinkers – the moderate wine consumption in Germany is defined as 0.301 wine/day. This corresponds to 32.2 g of pure alcohol. In Hungary, however, it is 0.361 or 37.4 g of pure alcohol. The German Department for Addiction Issues sets a threshold for low-risk consumption at 12 g of pure alcohol for women and 24 g for men, while other authorities advise no more alcohol than 20 g for women and 30 g for men. The values of the investigation are above the recommended limit. In Hungary, the recommended amount is 17 g (female) and 34 g (male). These values also exceed the official limits. When comparing gender, there was a significant difference between males (0.45 l) and females (0.32 l) in Hungary, but a similar estimation of moderate wine consumption in Germany (0.35 vs 0.33 l). Between the countries, Hungarian men value modest wine consumption significantly more than German men. By comparing the recommended amount of consumption, it becomes clear that the deviation of women from the recommended amount is significantly greater than that of men.

	At home		In restaurants		At visits		At events out-of-home	
	Germany n = 1,197 (%)	Hungary n = 984 (%)						
16–29 years	31	36	20	21	34	30	15	12
30–39 years	45	47	19	15	25	27	11	12
40–49 years	47	51	17	12	24	27	12	10
50–65 years	46	57	18	12	25	25	12	6
Older than 65 years	54	70	17	8	22	18	8	4
Average	45	53	18	13	26	25	12	9

**Table 2.**

Place of consumption  
in Germany and  
Hungary by age  
segments (only wine  
drinkers)

The different age groups rated moderate wine consumption similarly – but Hungarian consumers at a significantly higher level in the age group of 30–65 years. Regardless of the country, we found a positive correlation between consumption frequency and how respondents evaluated the volume of moderate wine consumption. The less wine is drunk, the lower is moderate wine consumption evaluated.

From the point of view of the total population, excessive wine consumption is more than twice the moderate amount of consumption (Table 4). Germans estimated the value of excessive wine consumption at 0.76 l, while Hungarians reported 1.0 l. In Hungary, all values are significantly higher than in Germany.

Similar to the results of moderate wine consumption, age did not seem to significantly affect the assessment of excessive wine consumption. In terms of gender, males in both countries have a slightly higher value. The largest influence on estimation was detected when segmented by consumption frequency. Here, it becomes obvious again that frequent

**Table 3.**  
Evaluation of  
moderate wine  
consumption per day  
(13% vol. Alc. wine)  
in litres and grams of  
pure alcohol by  
gender, age and  
consumption  
frequency

	Germany	Hungary	F-Value	Sign.
Male <sup>a</sup>	0.351 (36.5 g)	0.451 (46.9 g)	49.186*	0.000
Female <sup>a</sup>	0.331 (34.4 g)	0.321 (33.1 g)	0.623	0.427
16/18–29 years old <sup>a</sup>	0.341 (35.3 g)	0.381 (39.6 g)	2.471	0.117
30–49 years old <sup>a</sup>	0.341 (35.3 g)	0.381 (39.6 g)	7.792*	0.050
50–65 years old <sup>a</sup>	0.341 (35.3 g)	0.411 (42.2 g)	10.404*	0.001
Older than 65 years <sup>a</sup>	0.331 (34.4 g)	0.361 (37.3 g)	2.052	0.153
Frequent wine drinkers <sup>a</sup>	0.411 (42.3 g)	0.461 (48.1 g)	8.790*	0.003
Occasionally wine drinkers <sup>a</sup>	0.341 (35.3 g)	0.361 (37.3 g)	2.069	0.151
Infrequent wine drinkers <sup>a</sup>	0.301 (31.6 g)	0.321 (33.1 g)	1.016	0.314
Non-wine drinkers <sup>b</sup>	0.271 (28.1 g)	0.321 (33.3 g)	11.003*	0.001
Total population <sup>c</sup>	0.311 (32.2 g)	0.361 (37.4 g)	12.546*	0.001

**Notes:** \*Significant differences at  $p < 0.05$ , ANOVA-test between German and Hungarian participants;  
<sup>a</sup>only wine drinkers (Germany n = 1,197; Hungary n = 984); <sup>b</sup>only non-wine drinkers (Germany n = 803; Hungary n = 516); <sup>c</sup>all participants (Germany n = 2,000; Hungary n = 1,500)

**Table 4.**  
Evaluation of  
excessive wine  
consumption per day  
(13% vol. Alc. wine)  
in litres and grams of  
pure alcohol by  
gender, age and  
consumption  
frequency

	Germany	Hungary	F-Value	Sign.
Male <sup>a</sup>	0.831 (86.4 g)	1.221 (127.1 g)	135.591*	0.000
Female <sup>a</sup>	0.771 (80.5 g)	0.971 (100.7 g)	51.914*	0.000
16/18–29 years old <sup>a</sup>	0.801 (83.2 g)	1.111 (115.0 g)	26.351*	0.000
30–49 years old <sup>a</sup>	0.811 (84.5 g)	1.121 (116.1 g)	66.400*	0.000
50–65 years old <sup>a</sup>	0.801 (82.9 g)	1.121 (116.1 g)	54.087*	0.000
Older than 65 years <sup>a</sup>	0.791 (81.7 g)	1.001 (104.4 g)	28.819*	0.000
Frequent wine drinkers <sup>a</sup>	0.871 (90.9 g)	1.261 (131.0 g)	80.806*	0.000
Occasionally wine drinkers <sup>a</sup>	0.801 (83.7 g)	1.101 (114.8 g)	55.749*	0.000
Infrequent wine drinkers <sup>a</sup>	0.761 (79.0 g)	0.881 (91.8 g)	14.721*	0.000
Non-wine drinkers <sup>b</sup>	0.701 (72.7 g)	0.851 (88.4 g)	80.024*	0.000
Total population <sup>c</sup>	0.761 (78.6 g)	1.021 (106.3 g)	12.546*	0.001

**Notes:** \*Significant differences at  $p < 0.05$ , ANOVA-test between German and Hungarian participants;  
<sup>a</sup>only wine drinkers (Germany n = 1,197; Hungary n = 984); <sup>b</sup>only non-wine drinkers (Germany n = 803; Hungary n = 516); <sup>c</sup>all participants (Germany n = 2,000; Hungary n = 1,500)

wine drinkers evaluate the volume of excessive wine consumption much higher than the other consumer groups.

In the whole sample, as well as in the group of wine drinkers, the values were clearly rated higher than the official values.

#### *4.3 Consumers' image of wine and alcohol consumption*

To analyse consumers' attitudes towards alcohol and wine consumption and its link to health related issues (*RQ2*), six statements were evaluated on a scale of 0 (totally disagree) to 6 (totally agree). Five of the statements were wine- and one alcohol-related. When comparing the German and Hungarian results, it becomes clear that consumers from both countries rated the statements more or less in a similar way ([Table 5](#)). Both German and Hungarian consumers agreed with a very high level of average (5.5 and 5.3 out of 6.0) that certain persons (pregnant women, adolescents below 16 years in Germany and 18 years in Hungary) should not drink wine and that excessive wine consumption is detrimental to health – these statements were, in both countries, rated significantly higher compared to other statements.

The questions on “moderate wine consumption” combined with “healthy lifestyle” (statement 3) as well as “wine consumption” and “alcohol abuse” (statement 4) were similarly assessed by both nations, though Hungarian consumers rated all three statements slightly higher than the Germans. Statement 5, which deals with wine consumption in small amounts, also was assessed on the same in both countries.

The statement “any alcohol consumption is dangerous” was rated significantly higher in Germany. This is owing to the fact that the proportion of non-wine drinkers in Germany is much higher than in Hungary.

Comparing wine drinkers with non-wine drinkers, it became clear that the assessment of statements very much depended on personal experience and the consumption of wine. Non-wine drinkers from both countries were much less in agreement with statements such as “moderate wine consumption can be combined with a healthy lifestyle”, “I do not consider moderate wine consumption as an alcohol abuse” and “wine consumption is only suggested in modest amounts” than wine drinkers. Surprisingly, however, both groups rated the first two statements quite identically, with no significant differences. This signals a general sensitisation of the population, regardless of the intensity of wine consumption, to critical issues such as vulnerable target groups and alcohol consumption, as well as excessive wine consumption and health. These findings are in line with the results of [Eurobarometer \(2010\)](#), which investigated EU citizens' levels of awareness of alcohol-related health harm by asking

	Germany	Hungary	F-value	Sign.
1) Some people (e.g. pregnant women, underage people, etc.) should avoid drinking	5.5	5.3	10.498*	0.040
2) Excessive drinking of wine is bad for your health	5.3	5.1	7.194	0.064
3) Moderate consumption of wine can be compatible with a healthy lifestyle	4.5	4.7	7.954	0.061
4) Moderate wine consumption is not alcohol abuse	4.4	4.5	6.532	0.075
5) I believe that wine is best appreciated in small amounts	4.4	4.6	7.450	0.059
6) Drinking alcoholic beverages is dangerous no matter the quantity or the type of alcoholic beverage	3.7	3.3	20.011*	0.000

**Notes:** \*Significant differences at  $p < 0.05$ ; ANOVA-test between German and Hungarian participants

**Table 5.**  
Comparing  
statements regarding  
alcohol consumption  
and health by  
country

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respondents whether they agree or disagree that the consumption of alcoholic beverages can increase the risk of certain health conditions. The results indicate “[...]a fairly high level of awareness that consumption of alcoholic beverages may involve risk of health harm [...]” ([Eurobarometer, 2010](#)).

Gender also caused differences in the assessment of the statements. Accordingly, women rated almost all statements significantly higher than men did. This testifies to a pronounced sensitivity of female consumers, as opposed to men, in terms of alcohol and health.

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Age difference did not seem to significantly influence opinions on wine consumption and health. In Germany, only the youngest generation (16–29 years old), with their much softer opinion, stood out against alcohol and wine consumption, while in Hungary, all age groups judged the statements similarly.

Frequent wine drinkers who consume wine at least once a week were more indulgent to the statements listed here than occasional or rare drinkers. This phenomenon occurred both in Germany and in Hungary.

## 5. Conclusion

The aim of the study presented here was to analyse the opinion of consumers from Germany and Hungary on moderate wine consumption and alcohol abuse (*RQ1*) as well as on alcohol consumption and health issues (*RQ2*). A representative survey was conducted with 2,000 respondents in Germany and 1,500 in Hungary. Although wine generally has the image of being healthier than other alcoholic beverages ([Higgins and Llanos, 2015](#); [Chang et al., 2016](#)), consumers do not have a clear idea of where moderate wine consumption ceases and where excessive wine consumption begins. Compared to the official recommended national limits, the values assessed by consumers are in both cases overestimated. This is in line with the results of previous studies by [Barreiro-Hurlé et al. \(2008\)](#) and [Vecchio et al. \(2017\)](#). Consumers in Germany defined moderate wine consumption as 32 g and in Hungary as 37 g of pure alcohol/day. When asked, “Where does excessive wine consumption per day begin”, consumers responded even more cautiously, giving 79 g in Germany and 106 g of pure alcohol/day in Hungary. As the results show, consumption frequency and nationality influenced the assessed amount of wine significantly, both for moderate and for excessive wine consumption. National differences were also found in the study by [Vecchio et al. \(2017\)](#), while the correlation between involvement associated with drinking frequency and perceived wine consumption was stated by [Yoo et al. \(2013\)](#). Moreover, similar to [Saliba and Moran \(2010\)](#) and [Chang et al. \(2016\)](#), a significant difference between males and females could be confirmed in Germany when it came to moderate consumption and in Hungary in both cases. These results shed light on the significant differences between countries with different cultural backgrounds and between males and females.

At this stage, the differences between wine drinkers and non-wine drinkers should be emphasised. [Szolnoki and Totth \(2020\)](#) described in their study some fundamental differences between wine and non-wine drinkers in Germany and Hungary, however, as already stated in sub-chapter 4.2, consumption frequency plays a central role also when people assess thresholds of moderate and excessive wine consumption. Because of this, the perception of non-wine drinkers in terms of volume of consumed wine is more sensitive in both countries than that of wine drinkers. Although non-wine drinkers evaluated both values significantly lower, the discrepancy nevertheless is not too large.

Regarding the statements’ evaluation, unlike [Vecchio et al. \(2017\)](#) and [Yoo et al. \(2013\)](#), we did not find larger differences between the two different countries. The majority of Germans and Hungarians surveyed agree that pregnant women or minors should avoid wine consumption, and too much wine is harmful to their health. Other statements about

moderate wine consumption were judged significantly differently depending on gender, age and frequency of use, but there were no major differences between the German and Hungarian results. The respondents rated the danger of any alcohol consumption more moderately – this statement reached an average of 3.7 in Germany and 3.3 in Hungary (measured on a scale of 0 to 6).

### 5.1 Implication

The results presented here help to understand how consumers perceive moderate and excessive wine consumption in everyday life and how they judge wine as an alcoholic beverage. The representative sample mirrors the general opinion of the whole population, which allows understanding the attitude of various segments from two different countries towards wine consumption and health issues. In addition, with these results, the target group of frequent drinkers can be accurately described. These findings can contribute to a long-term goal-oriented wine in moderation strategy for consumers and support policy advice on “moderate and excessive wine consumption”. By describing precisely the target group of consumers assessed the moderate and excessive wine consumption higher or lower than the average, the Wine in Moderation strategy focussing on consumers can be specified to reach selected groups of the total population. This would allow tailor-made communication and special measures for those who belong to these groups. Similar to this, a policy-making strategy can be derived from these findings. Comparing the assessment of moderate and excessive consumption of all kind of alcoholic beverages in the future, a clear picture of beer, wine and spirits consumption in Germany and Hungary could provide deeper and profound insights about the target groups as well as about the role of these beverages. The statements’ evaluation reflects a clear understanding of consumers how alcohol consumption and health issues regarding vulnerable audiences as well as excessive wine drinking and health danger are assessed. This finding offers a good starting point for a discussion on further communication and policy strategies, e.g. using the pictogram of “pregnant woman no alcohol” or a new pictogram with “minors and no alcohol”. At the same time, stronger cooperation of “Wine in Moderation” with the wine industry could contribute to the fight against excessive wine consumption worldwide.

### 5.2 Limitation and further research

As one of the main limitations, the focus on only two European countries as well as the limited length of the statement battery should be mentioned. Because of the limited resources and time, only Germany and Hungary were selected. The decision is based on different cultural and historical backgrounds. The authors are convinced, that a similar study with examples from Scandinavia or Mediterranean countries, or even with New World wine countries, would bring a wider findings and a deeper understanding and inside of cultural differences. Furthermore, a longer and more specified statement battery with, e.g. health consciousness scale tested among others by [Chang et al. \(2016\)](#) could be used to measure more precisely the image character and the correlation between health perception and wine consumption.

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**Corresponding author**

Gergely Szolnoki can be contacted at: [gergely.szolnoki@hs-gm.de](mailto:gergely.szolnoki@hs-gm.de)