THE MISSING LINK: PER CAPITA ALCOHOL CONSUMPTION & ALCOHOL-RELATED HARM

An analysis of long-term evidence from **Sweden**

Note about the author and study background:

This document was commissioned by spiritsEUROPE and prepared by G. Z. Research & Consulting KG based in Vienna, Austria. Dr Gregor Zwirn (Managing Director at G. Z. Research & Consulting KG & Research & Associate at the University of Cambridge) was asked to compile longer-term alcohol-related data with the aim to contextualise and interpret recent developments with a special focus on Sweden. The author opted for a backward-looking, a –posteriori approach, using longer-term data and descriptive statistics, as well as the explanation by contrast methodology (comparing Nordic to Mediterranean countries) to assess whether there is still a Nordic drinking patterns nowadays. Since this document represents only a collection of data by using descriptive statistics, it does not recommend any measures to tackle alcohol-related harm. However, the evidence presented in this document may support the design and revisit of measures to tackle alcohol-related harm. Does the evidence support the dominant 'public health approach' or its widely forgotten alternative, the 'health promotion approach'?

Explanatory note on the use of data & analyses made:

The entire analysis relies on descriptive and summary statistics: no correlations or regressions are calculated. Hence, all indications of a possible relationship or absence of a relationship are solely observational. A more sophisticated assessment of an association would require regression analyses (selecting dependent and independent variables as well as control variables), which is not within the scope of this project. However, this collection of data could be used for a more sophisticated regression analysis in a future project. Apart from data by The IWSR – drinks market analysis, all data is publicly available.

January 2022

CONTENTS

EXECUTIVE SUMMARY

This study examines if there still is such a concept as a Nordic drinking pattern in Europe today, which has traditionally been captured as consisting of irregular heavy drinking sessions. In light of the declining trends in per capita alcohol consumption in many mature Western European markets, particularly among young people, the report tries to establish whether this is a temporary trend or whether it represents a more profound shift in the general attitude towards, and consumption of, alcohol.

Examining real-life data from the past 60 years in both Nordic and Mediterranean countries the report also finds robust evidence to put the so-called 'population-based approach' to tackle alcohol-related harm into question.

Is it necessary to reduce per capita alcohol consumption when trying to reduce alcohol-related harm? Advocates of the so-called 'population- based approach' firmly believe so. This paper challenges the assumption based on an in-depth analysis of long-term data from Sweden.

The analysis shows why trying to reduce per capita alcohol consumption without considering different drinking patterns as part of a harm reduction approach runs counter to many real-life developments and is likely to fail in practice.

Originally and for the main analysis, this report refers to recorded per capita alcohol consumption for essentially three reasons. First, this study should analyse long-term trends and only recorded per capita alcohol consumption figures for all Nordic and Mediterranean countries selected in this report are available from 1960 onwards. Second, since this is a cross-country comparison of longer-term trends, the source of data should be identical (different data collection methods yield different results). Third, by definition, unrecorded per capita alcohol consumption is not recorded, but needs to be estimated via different methods and therefore is less precise. Moreover, it is not clear that all countries apply the same methodology to collect unrecorded per capita alcohol consumption data. However, since the share of unrecorded alcohol consumption is estimated to be rather high in Sweden – especially after Sweden joined the EU – the original report was substantially revised in December 2021 and now tries to take also unrecorded alcohol consumption into account.

Advocates of the population-based approach often claim that the higher the price of alcoholic beverages (=the less affordable they are), the lower the level of per capita alcohol consumption. However, this claim does not hold up for many Western European countries such as Sweden.

In Sweden, recorded per capita alcohol consumption is at about the same level today as it was 60 years ago. At the same time, however, Swedes nowadays earn more than three times as much as they used to earn back then (in real terms). This means the real-term affordability of alcoholic beverages has increased significantly even though real prices have increased as well (above inflation).

These findings remain unchanged when looking at total per capita alcohol consumption after 1995 when Sweden joined the EU, which includes estimates for unrecorded alcohol consumption, often obtained via legal cross-border shopping of relatively cheaper alcoholic beverages in neighbouring countries. According to data from Centralförbundet för alkohol- och narkotikaupplysning (henceforth CAN), total per capita alcohol consumption peaked in 2004 and declined between 2004 and 2019. This decline in total per capita alcohol consumption occurred even though real GDP per capita was always higher in each year after 2004, meaning that alcoholic beverages became structurally more affordable. The total per capita alcohol consumption level in 2018 (9 litres of pure alcohol) was as high as in 2002 (8.9 litres of pure alcohol), according to WHO data, but real GDP per capita in 2018 was more than 1/4 higher compared to

2002. Furthermore, WHO also indicates that while alcoholic beverages became structurally more affordable in 2018, less total per capita alcohol was consumed.

This would suggest that – on a broader, long-term scale – per capita alcohol consumption and alcohol affordability do not correlate at all.

Along similar lines, there is no clear long-term correlation in Sweden between the level of, and trend in, (recorded as well as total) per capita alcohol consumption and major alcohol-related harm indicators such as heavy episodic drinking, life expectancy at birth, drink- driving deaths, underage drinking, or other chronic alcohol-related diseases including selected cancers.

Finally, it seems that, today, the Nordic drinking culture is approaching more and more the Mediterranean drinking style. The way Swedes consume alcoholic beverages as well as their choice of alcoholic beverages have changed. Heavy episodic drinking is on the decline in Nordic countries, as it is in Mediterranean countries. As regards underage drinking indicators, declining trends in Nordic and Mediterranean countries are also converging.

To conclude, a backward-looking, a–posteriori approach, using longer-term data and descriptive statistics as well as the explanation by contrast methodology (comparing Nordic to Mediterranean countries) supplements the existing evidence base: pursuing the objective of reducing (total and recorded) per capita alcohol consumption as part of an alcohol-related harm reduction strategy without taking different drinking patterns into account seems questionable. Observable long-term trends show that developments in Western European countries such as Sweden over the past decades have followed exactly the opposite path. This should be taken into account whenever alcohol-related public health measures are discussed.

As illustrated in this report, the empirical evidence over the past 60 years would indicate that alcohol-related public health policy measures in Western European countries could primarily target at-risk groups rather than average per capita alcohol consumption which includes the vast majority of consumers, namely, light-to-moderate drinkers. As regards the future reduction of alcohol-related harm in Western Europe, perhaps it is time to shift focus away from the ‘population-based approach’ and put renewed emphasis on targeted ‘health promotion’ approaches.

SAMMANFATTNING

Denna studie undersöker huruvida det i Europa fortfarande finns nordiska dryckesmönster, som historiskt har beskrivits som periodvist kraftigt drickande. I ljuset av den nedåtgående trenden i alkoholkonsumtion per capita i många västeuropeiska länder, särskilt bland yngre personer, försöker rapporten fastställa huruvida det är en tillfällig trend eller om den representerar ett mer betydande skifte i den generella attityden gentemot alkoholkonsumtion.

Genom att undersöka data från de senaste 60 åren i såväl nordiska som medelhavsländer finner rapporten även goda bevis för att ifrågasätta totalkonsumtionsmodellens effektivitet för att motverka alkoholrelaterade skador.

Är det nödvändigt att minska alkoholkonsumtionen per capita för att minska alkoholrelaterade skador? Det anser bestämt förespråkare för den så kallade totalkonsumtionsmodellen. Detta dokument utmanar antagandet baserat på en djupgående analys av långsiktiga data från Sverige.

Analysen visar varför ambitionen att minska alkoholkonsumtionen per capita, utan att beakta olika dryckesmönster som del av en skademinimeringsstrategi, på många punkter står i kontrast till hur den faktiska utvecklingen sett ut och varför den sannolikt kommer att misslyckas i praktiken.

Ursprungligen och för huvudanalysen hänvisar denna rapport till registrerad alkoholkonsumtion per capita av huvudsakligen tre skäl. För det första bör denna studie analysera långsiktiga trender och endast registrerade siffror för alkoholkonsumtion per capita för alla nordiska länder och Medelhavsländer som valts ut i denna rapport är tillgängliga från 1960 och framåt. För det andra, eftersom detta är en jämförelse av långsiktiga trender mellan länder, bör datakällan vara densamma (olika datainsamlingsmetoder ger olika resultat). För det tredje registreras per definition inte oregistrerad alkoholkonsumtion per capita, utan den uppskattas med olika metoder och är därför mindre exakt. Dessutom är det inte klart att alla länder använder samma metod för att samla in oregistrerade uppgifter om alkoholkonsumtion per capita. Men eftersom andelen oregistrerad alkoholkonsumtion bedöms vara ganska hög i Sverige – särskilt efter att Sverige gick med i EU – reviderades den ursprungliga rapporten kraftigt i december 2021 och försöker nu även ta hänsyn till den oregistrerade alkoholkonsumtionen.

Förespråkare för totalkonsumtionsmodellen hävdar ofta att ju högre priset på alkoholhaltiga drycker är, desto lägre blir alkoholkonsumtionen per capita. Detta påstående håller dock inte i de flesta västeuropeiska länder, såsom Sverige.

I Sverige ligger den registrerade alkoholkonsumtionen per capita på ungefär samma nivå idag som för 60 år sedan. Samtidigt tjänar svenskar mer än tre gånger så mycket idag jämfört med då (i reella termer). Detta innebär att människors köpkraft av alkoholhaltiga drycker har ökat betydligt, trots att de reella priserna också ökat (över inflationen). Det tyder på att alkoholkonsumtion per capita i ett bredare, långsiktigt perspektiv inte överhuvudtaget korrelerar med hur mycket alkohol människor har råd att köpa.

Dessa resultat förblir oförändrade när man tittar på den totala alkoholkonsumtionen per capita efter 1995 då Sverige gick med i EU, vilket inkluderar uppskattningar för oregistrerad alkoholkonsumtion, ofta införskaffad via laglig gränshandel av relativt billigare alkoholdrycker i grannländerna. Enligt uppgifter från Centralförbundet för Alkohol- och Narkotikaupplysning (hädanefter CAN) nådde den totala alkoholkonsumtionen per capita en topp under 2004 och minskade sedan mellan 2004 och 2019. Denna nedgång i den totala alkoholkonsumtionen per capita inträffade även om den reella BNP per capita alltid var högre varje år efter 2004, vilket innebar att alkoholhaltiga drycker blev strukturellt mer överkomliga. Den

totala alkoholkonsumtionen per capita 2018 (9 liter ren alkohol) var lika hög som 2002 (8,9 liter ren alkohol), enligt WHO-data, men den reella BNP per capita 2018 var mer än 1/4 högre jämfört med 2002. Dessutom indikerar WHO också att medan alkoholhaltiga drycker blev strukturellt mer överkomliga 2018, konsumerades mindre total alkohol per capita.

På liknande sätt finns det ingen tydlig korrelation i Sverige mellan alkoholkonsumtion (såväl registrerad som total) per capita och viktiga alkoholrelaterade skadeindikatorer, såsom periodvist kraftigt drickande, förväntad livslängd vid födseln, dödsfall till följd av rattfylleri, konsumtion bland minderåriga eller andra kroniska alkoholrelaterade sjukdomar, inklusive utvalda cancerformer.

Det verkar som att nordiska dryckesmönster mer och mer närmar sig de dryckesmönster som finns i många medelhavsländer. Såväl sättet som svenskar konsumerar alkohol som deras val av alkoholhaltiga drycker har förändrats: periodvist kraftigt drickande är på nedgång i nordiska länder, precis som i medelhavsländer. När det gäller drickande bland yngre personer blir de nedåtgående trenderna i nordiska länder och medelhavsländer alltmer likartade.

Sammanfattningsvis, det verkar tveksamt att verka för en minskad (total och registrerad) alkoholkonsumtion per capita utan att beakta olika dryckesmönster som en del av en alkoholrelaterad strategi för skademinskning. Observerbara långsiktiga trender visar att utvecklingen i västeuropeiska länder som Sverige under de senaste decennierna har gått precis motsatt väg. Detta bör beaktas när alkoholrelaterade folkhälsoåtgärder diskuteras.

Som illustreras i rapporten indikerar de empiriska bevisen under de senaste 60 åren att alkoholhälsopolitiska åtgärder i västeuropeiska länder bör rikta sig mot riskgrupper snarare än genomsnittlig alkoholkonsumtion per capita, vilket inkluderar den stora majoriteten av konsumenterna: låg- till medelkonsumenter. För att minska alkoholrelaterade skadeverkningar i Västeuropa, är det kanske dags att skifta fokus bort från totalkonsumtionsmodellen och i stället fokusera på riktade ”hälsofrämjande” åtgärder.

INTRODUCTION & CORE OBJECTIVES OF THIS STUDY

The original research question addressed in this report was to assess whether there is such a thing as a 'Nordic drinking pattern' nowadays. The notion 'Nordic drinking pattern' often refers to irregular heavy drinking occasions. Such risky drinking behaviour could lead to acute (e.g., drink-driving, falls, violence, etc.) and, if followed for a longer time period, to chronic (e.g., liver disease, some cancer types, etc.) alcohol-related harm.

To answer the research question, I opted to use longer-term 'real life' data and the contrastive explanation approach, comparing Nordic to Mediterranean countries, with a special focus on Sweden. The list of data and data sources as well as the selection criteria can be assessed in the appendix to this document. The analysis is based on descriptive statistics and does not apply more advanced statistical techniques, such as regression analysis. It is a backward-looking approach rather than a forecast to the future, which is trendy at present. Instead of modelling the future, based on numerous assumptions – especially some level of stability in the social world needs to be assumed for long-term modeling forecasts, which often does not exist – this analysis uses data from the past with the objective to learn for the future.

While working on the original research question, the project objective broadened and slightly shifted to a more general assessment of the contemporary and popular 'public health approach' to tackle alcohol-related harm.

Today's public health discourse on how to reduce alcohol-related harm most effectively and efficiently is often captured, and constrained, by the broad interventionist claims of the population-based alcohol theory. According to the population-based theory, alcohol-related harm is closely related to per capita alcohol consumption.

In line with this assumption, the alleged correlation is used as a sufficient justification to claim that per capita alcohol consumption should serve both as:

- → the key indicator for alcohol-related harm and
- → the primary intervention goal in itself

Accordingly, much attention is given to the design of broad interventionist measures to reduce average per capita alcohol consumption, as shown by the so-called 'Best Buy' policies designed to drastically reduce the availability and affordability of alcoholic beverages in a given country or region.

With reduced per capita alcohol consumption of a given population as the primary target, it, of course, becomes secondary, or even irrelevant, to consider whether the broad interventionist measures represent severe market interventions, whether they negatively impact moderate drinkers, or whether they can actually be considered proportionate in the first place. This also comes at the cost of neglecting other, perhaps more targeted, effective and efficient harm-reduction measures in the debate. The contemporary dominant 'population-based approach' or 'public health approach' should not override and completely replace its alternative, namely the 'health promotion approach'.

This document provides a critical review of the alleged association between per capita alcohol consumption and alcohol-related harm, using long-term evidence from Sweden. Contrary to the tenets of the population-based theory, we find that per capita alcohol consumption is only weakly associated with most harm-related factors. Even more, the data suggest that per capita consumption in isolation of different drinking patterns should not be used as a core target in itself if the objective is the effective and efficient reduction of alcohol-related harm.

The study's findings illustrate why, in certain circumstances, the population-based approach and its logic can be considered ineffective and inefficient to reduce alcohol-related harm.

Rather than leaving the broad claims of the population-based theory unchallenged, this study argues that the debate on how to reduce alcohol-related harm needs to be re-focussed and address key questions such as:

How can we design targeted, priority-based measures that are both:

- ↘ effective in reducing risky drinking patterns AND
- ↘ efficient (as not restricting moderate alcohol consumption)?

How can measures be more proportionate and avoid broad, restrictive/penalising effects on the majority of consumers who only represent a minority share of the harm at the very best?

How can unintended consequences of measures be avoided (which may cancel out any potential health gains)?

New per capita alcohol consumption data was published after the report was commissioned. Since this is an important indicator, the final draft report was substantially revised in December 2021 to take this new information into account.

→ **Chapter One** focusses on long-term per capita alcohol consumption trends and its composition of various alcoholic beverage types in Sweden. The revision in December 2021 also incorporated data on unrecorded per capita alcohol consumption since this is responsible for a significant share of total alcohol consumption in Sweden.

→ **Chapter Two** compares (recorded and total) per capita alcohol consumption in Sweden to other countries. It is especially interesting to see if trends in Nordic and Mediterranean countries differ, given the diverging climate, cultural and alcohol policy background.

→ **Chapter Three** focusses on alcohol affordability trends in Sweden. The affordability of alcoholic beverages can be influenced by price policy measures, such as taxation, banning alcohol sales below costs, or minimum unit prices. However, there are other factors that impact alcohol affordability, which cannot be modified that easily, such as inflation or disposable income. A main driver of alcohol affordability is income and hence, any tax/price policy measure impact assessment that ignores income developments remains incomplete. This chapter integrates income trends, via GDP per capita, as an approximation for disposable income.

→ **Chapter Four** deals with prices, excise duty rates and revenues for alcoholic beverages in Sweden. A significantly higher excise rate on spirits drinks compared to other beverage types is also responsible for the large share of spirits excise from total revenues, even though spirits drinks have the lowest share in sales. Most interestingly, it becomes apparent that prices for alcoholic beverages always increased above the inflation rate since 1996 in Sweden (the earliest date when data is available), meaning that not only nominal, but real prices for alcoholic beverages constantly increased.

→ **Chapter Five** looks at total and recorded per capita alcohol consumption levels and changes, which are compared to levels and changes in heavy episodic drinking, with a special focus on Nordic and Mediterranean countries. While heavy episodic drinking is still more common in Nordic countries, the gap to Mediterranean countries is closing. Moreover, the decline in heavy episodic drinking appears to be independent from the change in total and recorded per capita alcohol consumption.

→ **Chapter Six** compares recorded (and for Sweden also total) per capita alcohol consumption trends to trends in life expectancy at birth for the selected countries. Life expectancy at birth is on an increase in Nordic and Mediterranean countries, irrespective of the trend in recorded per capita alcohol consumption.

→ In **Chapter Seven** we compare drink-driving deaths trends to recorded (and for Sweden also to total) per capita alcohol consumption. The latter does not adequately explain the declining trend in drink-driving deaths in Nordic and Mediterranean countries.

→ **Chapter Eight** looks at underage drinking indicators in Sweden and compares them to total and recorded per capita alcohol consumption. Per capita alcohol consumption appears to be rather independent from underage drinking indicators in Sweden.

→ **Chapter Nine** compares trends of underage drinking indicators between Nordic and Mediterranean countries. Positive trends can be seen in all selected countries rather independently of the level and change in total as well as recorded per capita alcohol consumption.

→ **Chapter Ten** compares per capita alcohol consumption trends (when possible, not only recorded, but also total per capita alcohol consumption) to various chronic alcohol-related diseases. The comparison does not reveal associations between these indicators, even if a time lag of 15 and 20 years is considered. A further, and more sophisticated analysis is necessary to determine if per capita alcohol consumption can explain trends in chronic alcohol-related diseases.

→ To round off this report, **Chapter Eleven** sheds a brief light on chronic disease trends in the selected countries and compares these trends to recorded per capita alcohol consumption without and with a 15- as well as 20-year time lag. No clear association between these indicators can be observed.

#1 Per capita alcohol consumption levels & trends in Sweden

When this study was commissioned, the most recent per capita alcohol consumption data by WHO dated back to 2016. While the original report was conducted, WHO published new per capita alcohol consumption data. For most countries, data is now available until 2019.

For the main analysis, I opted to use recorded per capita alcohol consumption data for the following reasons:

1. I am interested in longer-term trends. Recorded per capita alcohol consumption is available for all the countries analysed in this study from 1960s onwards within the WHO database.
2. Unrecorded per capita alcohol consumption is only available for four specific years, namely 2005, 2010, 2016 and now 2019 (when the study was commissioned, only three data points were available) within the WHO database.
3. Since this study uses a contrastive explanation approach, comparing Nordic to Mediterranean countries, it is important to use the same data source. Depending on the source of information, per capita alcohol consumption (including unrecorded consumption) for different countries and years may vary: I assume due to methodological reasons.
4. As the term 'unrecorded' already indicates, this information is based on expert opinions, Delphi surveys, population surveys or on other means to obtain information on cross-border shopping, home production and/or tourist consumption. This information is not recorded but estimated and hence less precise.

While unrecorded alcohol consumption may not be of major concern in Mediterranean countries (though, perhaps except for Greece, at least after the economic crises and massive spirits tax/price increases), it represents a significant share of total alcohol consumption in Nordic countries, especially after 1995 when Finland and Sweden joined the EU and cross-border shopping allowances have changed.

Therefore, it is important to further investigate and try to incorporate unrecorded alcohol consumption data for Nordic countries, especially for Sweden, since this report puts a special focus on Sweden. Moreover, total per capita alcohol consumption (recorded plus unrecorded consumption) also represents the SDG indicator 3.5.2.

As mentioned above, long-term data on unrecorded alcohol consumption is not available, but even data after 1995, when Sweden joined the EU, is patchy and not readily available. Different sources sometimes provide inconsistent data for the same year and some data points are missing for other years. More details can be found in the appendix.

By contrast, recorded per capita alcohol consumption is regularly collected in many countries and serves as an indicator, which is used in scientific reports and studies. Especially from a fiscal point of view, this indicator is important and can be employed to design desired tax structures. However, per capita alcohol consumption figures are also often used by public health experts and policymakers. Based on the population-based approach/ hypothesis, per capita alcohol consumption serves as an indicator for alcohol-related harm. According to the population-based theory, the lower the level of per capita alcohol consumption, the lower alcohol-related harm. Hence, advocates of this theory promote public health policy measures that aim to reduce (total and recorded) per capita alcohol consumption.

Whether the population-based approach is supported by empirical evidence, is one of the questions that this and the following chapters of this document will address. This chapter will focus on (total and recorded) per capita alcohol consumption levels and trends as well as its composition by various beverage types in Sweden.

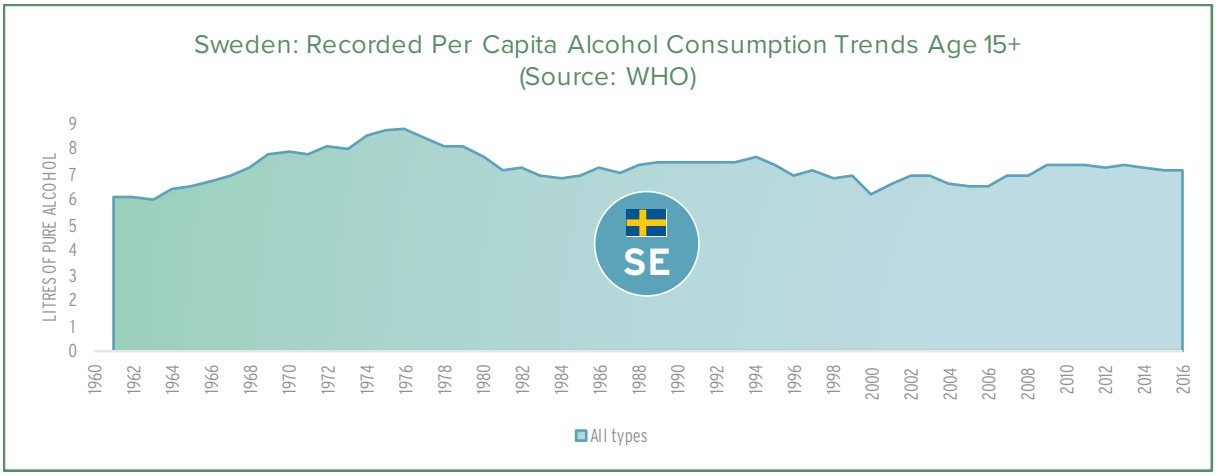
MAIN FINDINGS[1]

- Depending on the time span selected, recorded per capita alcohol consumption increased, decreased, or remained relatively stable in Sweden: it peaked in 1976.
  - The sharpest increase in recorded per capita alcohol consumption can be observed between 1961 and 1976.
  - The sharpest decline can be observed between 1976 and 1984. Also, between 1994 and 2000, a relatively sharp decline in recorded per capita alcohol consumption can be observed. However, this decline is overcompensated by the increase in estimated unrecorded per capita alcohol consumption after Sweden joined the EU.
  - Since the 1980s, recorded per capita alcohol consumption remained relatively stable.
- Total per capita alcohol consumption (including unrecorded consumption) either peaked in 2004 (according to CAN data) or 2010 (according to WHO data) and is declining since the respective years. In 2019, total per capita alcohol consumption reached a slightly lower level (according to CAN) or slightly higher level (according to WHO) as recorded per capita alcohol consumption in 1976.
- While wine consumption started from a relatively low level in 1961, wine consumption is now almost 4 times higher than in 1961. Since 2004, wine is the preferred beverage type in Sweden based on recorded figures.
- Beer was the preferred drink for seven years between 1968 and 1974 and again for 18 years between 1984-2001. Since 1961, beer consumption in Sweden increased by 11%. The beer consumption level in 2016 is 37% below the peak year, based on recorded figures.
- Spirits drinks were the preferred beverage type for seven years between 1961-1967 and again for seven years between 1976-1982. Since 1979 a significant drop in spirits consumption can be observed: -73%! Spirits consumption in 2016 is 3 times below the level recorded in 1961.
- In 2016, the share of spirits consumption of total recorded alcohol consumption is only 14%, whereas beer holds 36% and wine 48% of total recorded alcohol. The share remained unchanged for 2019 (48% wine, 37% beer and 14% spirits).
- The IWSR – drinks market analysis provides more recent recorded per capita alcohol consumption data for people above the legal purchasing age (at least when the report was commissioned).
  - Between 1994 and 2019, recorded per capita consumption declined by 9.2%. However, the drop occurred in the first two years and since 1996, recorded per capita alcohol consumption remained relatively stable in Sweden.
  - The beverage ranking in 2019 is the same as the one emerging from WHO data: wine is the preferred beverage type (42%), closely followed by beer (40%). Spirits drinks market share reached 16% in 2019.

[1] The first 5 key findings are based on WHO data, which provides the longest time-series information, but the most recent data point is for the year 2016. The 6th bullet point refers to IWSR data, which provides a shorter time-series, but up to 2019.

WHO provides the longest time series data collection for recorded per capita alcohol consumption levels in Sweden (1961-2016, see figure 1), when the report was commissioned (now, up to 2019).

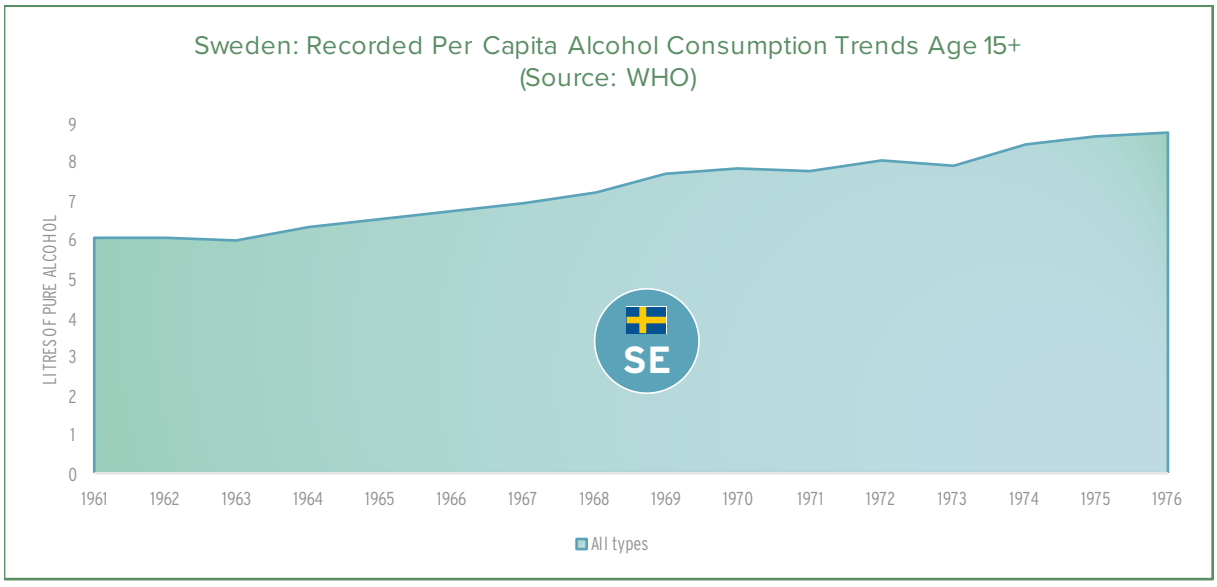
Figure 1: source (WHO – https://www.who.int/data)



Recorded per capita alcohol consumption peaked in 1976 with 8.78l of pure alcohol. The lowest level of recorded per capita alcohol consumption with 6.03l of pure alcohol was observed in 1963, almost the same level as in 1961 (6.04l).

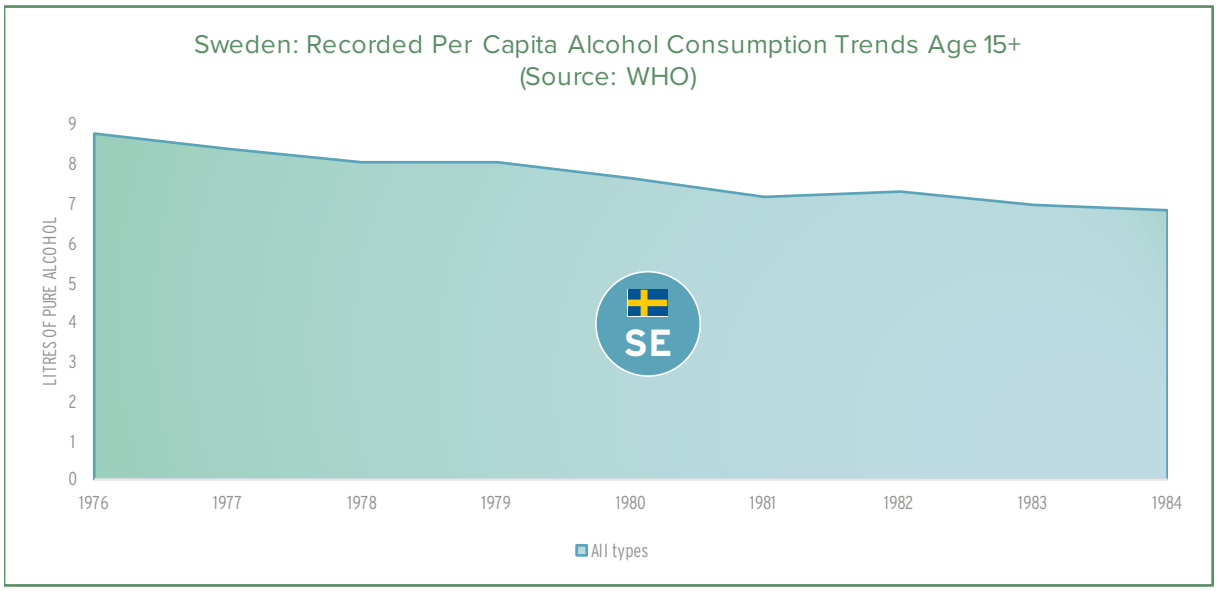
If one compares recorded per capita consumption levels of the two endpoints of the time-series (year 1961 (6.04l) to year 2016 (7.18l)), recorded per capita alcohol consumption increased by 18.9% between 1961 and 2016. However, an endpoint comparison is not a comprehensive description of the trend. Imagine, you would choose 1976 as the starting year, then, you would conclude that recorded per capita alcohol consumption declined by 18.2% between 1976 and 2016.

Figure 2: source (WHO – https://www.who.int/data)



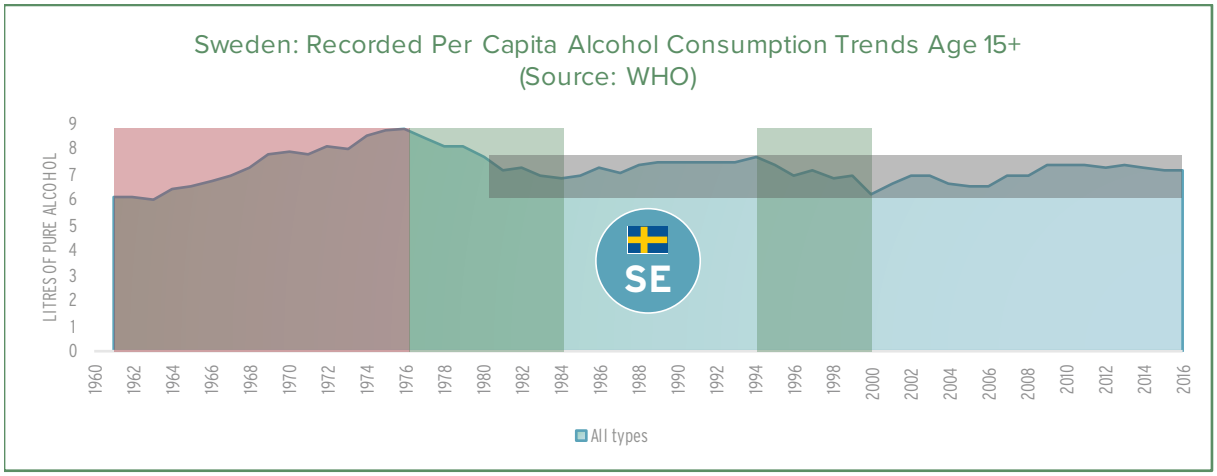
The sharpest increase in recorded per capita alcohol consumption occurred between 1961 and 1976: in the first 15 years, the increase amounted to 45.4% (see Figure 2). This was followed by the sharpest decline in the following 8 years, between 1976 and 1984: -22.3% (see figure 3).

Figure 3: source (WHO – https://www.who.int/data)



The second relatively sharp decline can be observed in the six years between 1994 and 2000, where recorded per capita alcohol consumption declined by 19.6%.

Figure 4: source (WHO – https://www.who.int/data)



Recorded per capita alcohol consumption remained relatively stable since the 1980s in Sweden.

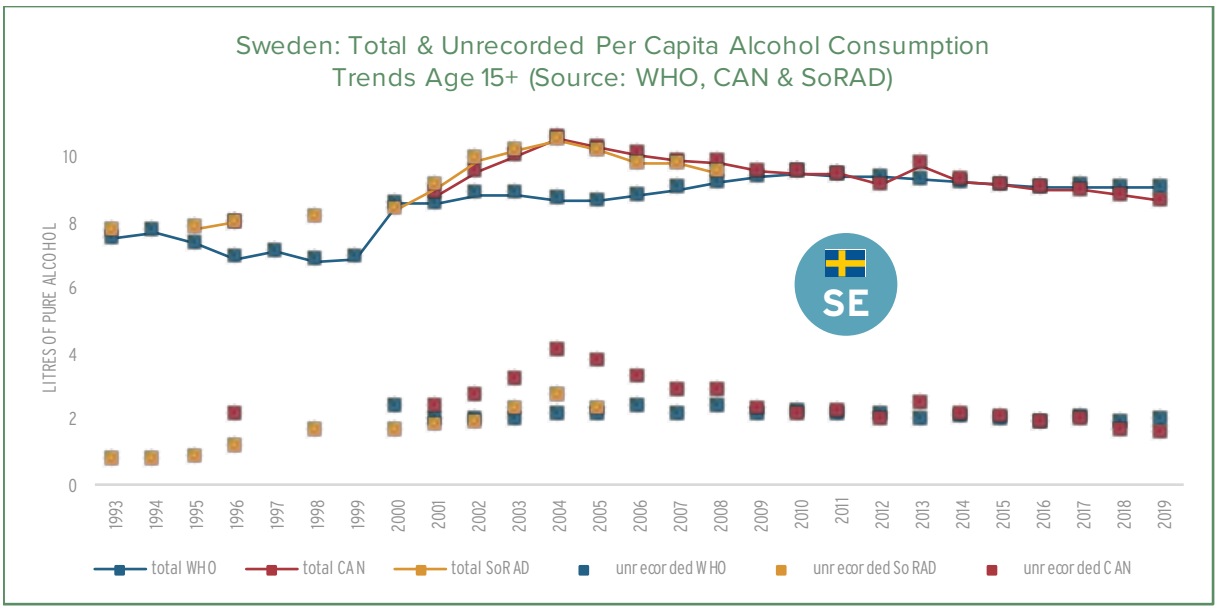
Depending on the period selected, one can find increasing, decreasing or relatively stable recorded per capita alcohol consumption trends. The current level of recorded per capita alcohol consumption is well below the peak from 1976, but also above the all-time low in 1963 (see Figure 4).

While recorded per capita alcohol consumption may closely represent total per capita alcohol consumption (that is recorded plus unrecorded consumption) between 1960 and 1995, changes in cross-border shopping allowances after Sweden joined the EU appear to have had an impact on unrecorded alcohol consumption. Therefore, recorded per capita alcohol consumption does not adequately capture total per capita alcohol consumption in Sweden after 1995. By definition, unrecorded alcohol consumption is not recorded and hence must be estimated, via expert opinions, Delphi and population surveys, or other means, and is therefore less precise. Moreover, data is patchy and not readily available: different sources

provide diverging numbers even for the same year. This report draws on data from WHO (https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption), CAN – Centralförbundet för alkohol- och narkotikaupplysning (https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf) and SoRAD – Centrum för socialvetenskaplig alkohol-och drogforskning (http://www.diva-portal.org/smash/get/diva2:513943/FULLTEXT01.pdf). Further details are in the appendix.

The difference in total per capita alcohol and unrecorded consumption depending on the different sources of information, is illustrated in figure 5.

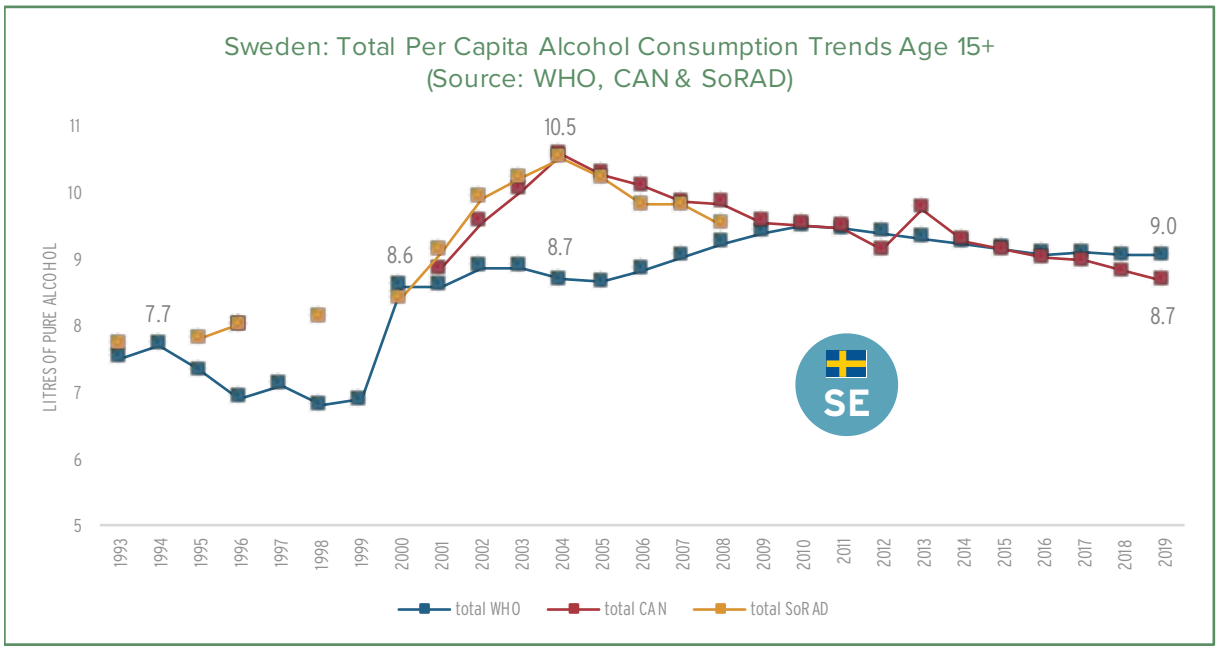
Figure 5: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption, CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf, and SoRAD – http://www.diva-portal.org/smash/get/diva2:513943/FULLTEXT01.pdf)



In 2001, total per capita alcohol consumption reached 9.1 litres, according to SoRAD (8.8 litres, according to CAN and 8.6 litres according to WHO) and SoRAD data suggests a gradual increase (0.2 litres between 1995 to 1996, 0.1 litres from 1996 to 1998, 0.3 litres from 1998 to 2000 and 0.7 litres from 2000 to 2001). At the same time, recorded per capita alcohol consumption decreased slightly, meaning that the increase in total per capita alcohol consumption is due to the increase in unrecorded consumption. Like CAN, SoRAD data also shows a relatively sharp increase in total per capita alcohol consumption between 2001 and 2005 (+1.1 litres). Notice that total per capita alcohol consumption remained relatively stable between 2000 and 2005, according to WHO data and increased later, namely between 2005 and 2010.

Using a different scale and removing unrecorded per capita alcohol consumption in the chart, better illustrates the different trends in total per capita alcohol consumption depending on the source of information.

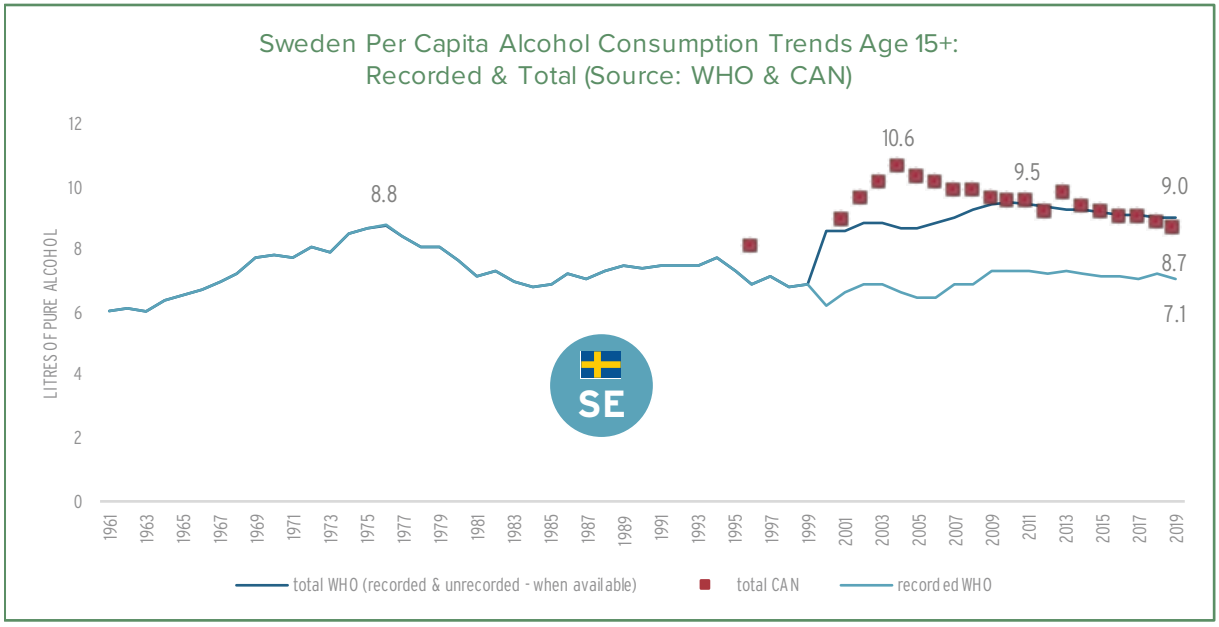
Figure 6: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption, CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf, and SoRAD – http://www.diva-portal.org/smash/get/diva2:513943/FULLTEXT01.pdf)



Total per capita alcohol consumption levels vary depending on the estimated level of unrecorded alcohol consumption in Sweden. While total per capita alcohol consumption levels are similar between 2010 and 2019 in all data sources, CAN and SoRAD report higher levels between 2001 and 2009. Only SoRAD data provides some data points after Sweden joined the EU until 2000, which includes estimates for unrecorded consumption and indicates a gradual increase in total per capita alcohol consumption rather than a decline, as shown in the WHO figure for recorded per capita alcohol consumption.

The long-term trend in per capita alcohol consumption (recorded & total – when data is available for unrecorded consumption) for Sweden using data by WHO and CAN, shows that total per capita alcohol consumption either peaked in 2004 (10.6 litres), according to CAN, or in 2010 (9.5 litres), according to WHO. In 2019, total per capita alcohol consumption is about the same level as recorded per capita alcohol consumption in 1976, when recorded per capita alcohol consumption peaked (see figure 7).

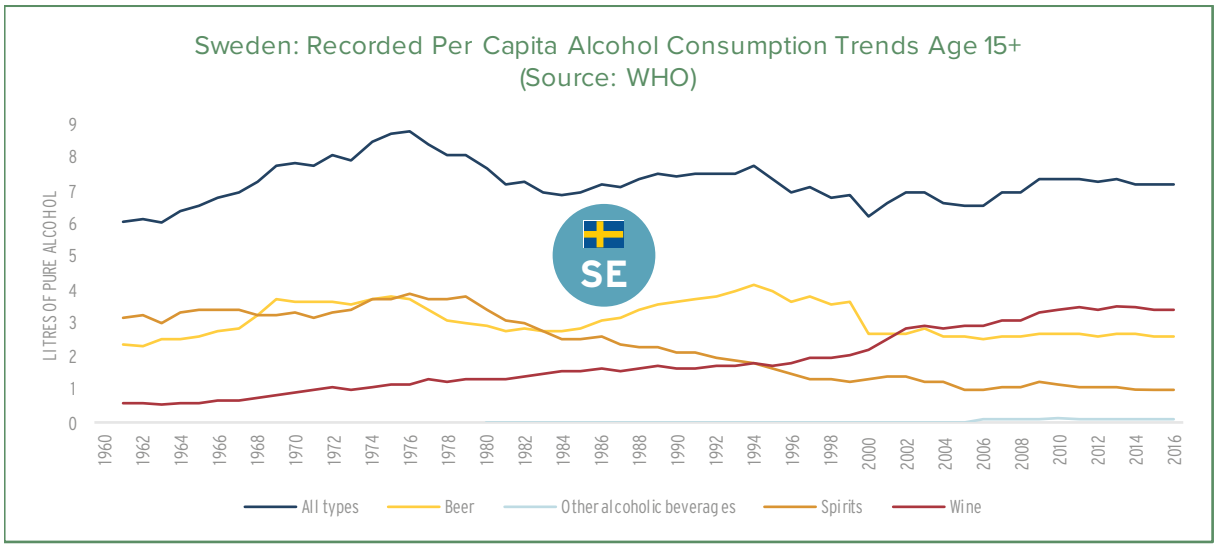
Figure 7: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf)



Unfortunately, no long-term data for unrecorded alcohol consumption in Sweden is available. However, legal cross-border shopping could only have increased after Sweden joined the EU in 1995. At that time, recorded per capita alcohol consumption reached 7.7 litres, declined to 6.2 litres in 2000, and was in 2019 still below the 1995 level, reaching 7.1 litres. Meanwhile, unrecorded per capita alcohol consumption experienced an increase, meaning that total per capita alcohol consumption peaked in 2010 (or 2004, according to CAN) and slightly declined to 9 litres (according to WHO data) or 8.7 litres (according to CAN data) in 2019. This is about the same level as recorded per capita alcohol consumption in 1976.

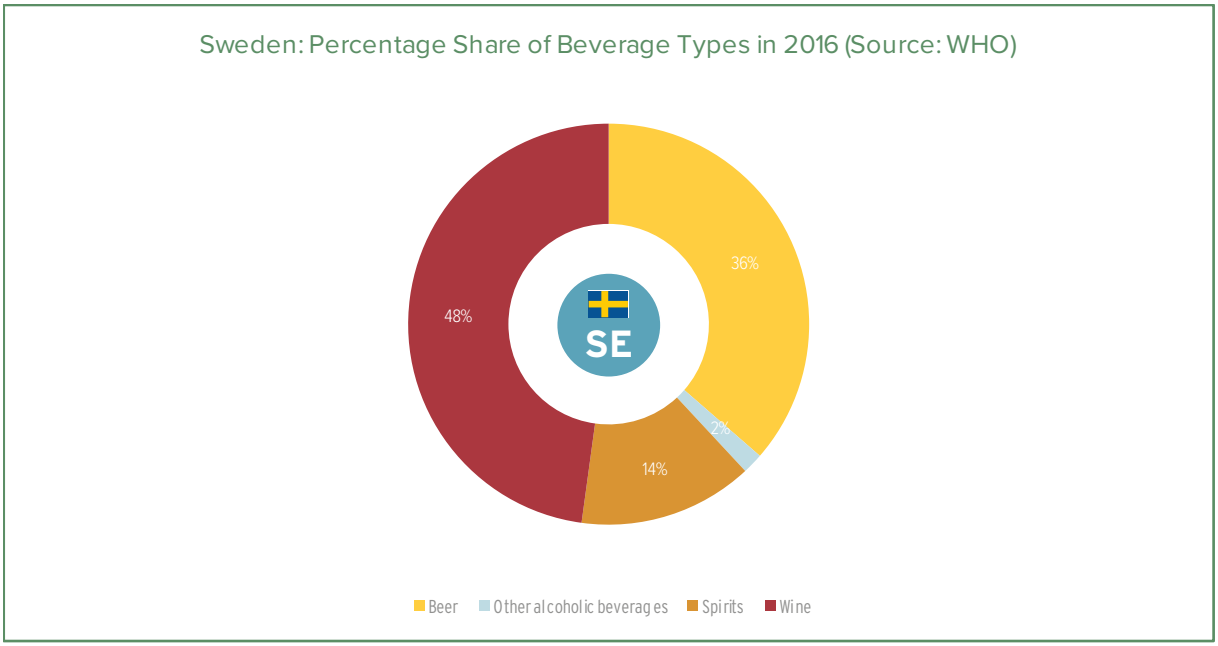
When disaggregating overall recorded per capita alcohol consumption into beverage types, it becomes apparent that wine consumption constantly grew from 1961 to 2016. While it was the least preferred beverage type between 1961-1994, it is the number one choice of drink since 2004. Spirits drinks were the preferred beverage type for seven years between 1961-1967 and again for seven years between 1976-1982. A significant drop in spirits consumption by -73% can be observed between 1979 and 2016 in Sweden. Beer was the preferred drink for seven years between 1968 and 1974 and again for 18 years between 1984- 2001 (see Figure 8).

Figure 8: source (WHO – https://www.who.int/data)



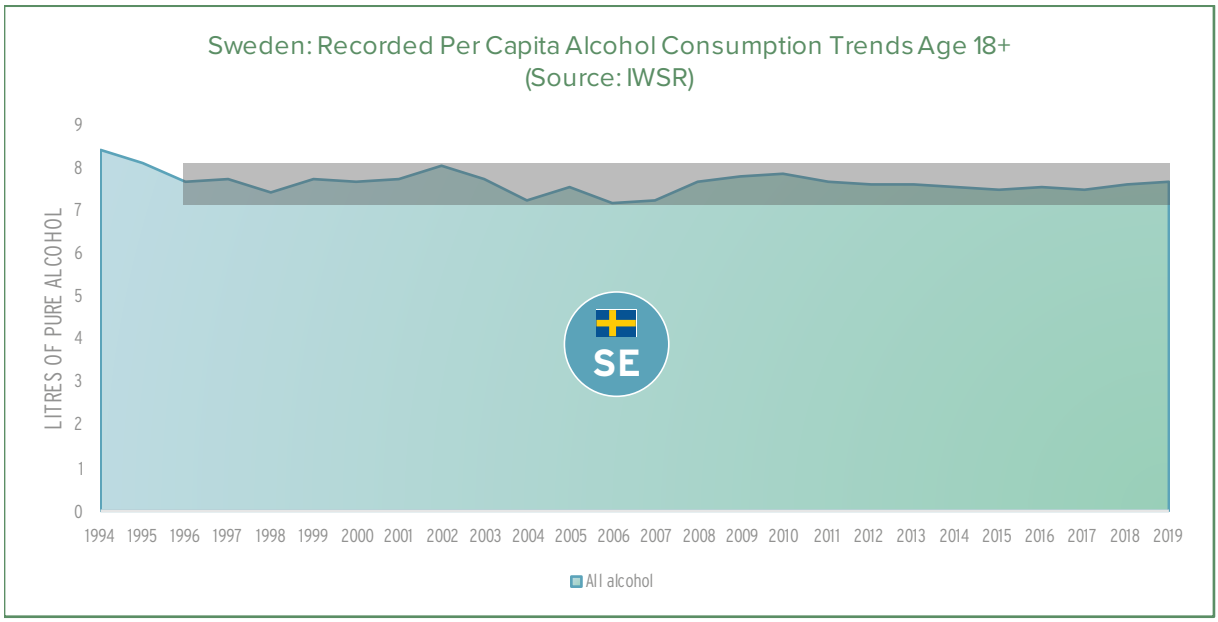
In 2016, 48% of all recorded alcohol consumed can be attributed to wine, 36% to beer and 14% to spirits drinks, according to WHO. The share remained unchanged for 2019, according to WHO data: 48% beer, 37% wine and 14% spirits. Unfortunately, WHO does not split total per capita alcohol consumption into different beverage types.

Figure 9: source (WHO – https://www.who.int/data)



The IWSR – drinks market analysis provides more recent data (up to 2019), but data is only available from 1994 onwards (see Figure 10). Moreover, it shows per capita alcohol consumption for people above the legal purchasing age (18+) rather than 15+, as shown in Figure 8.

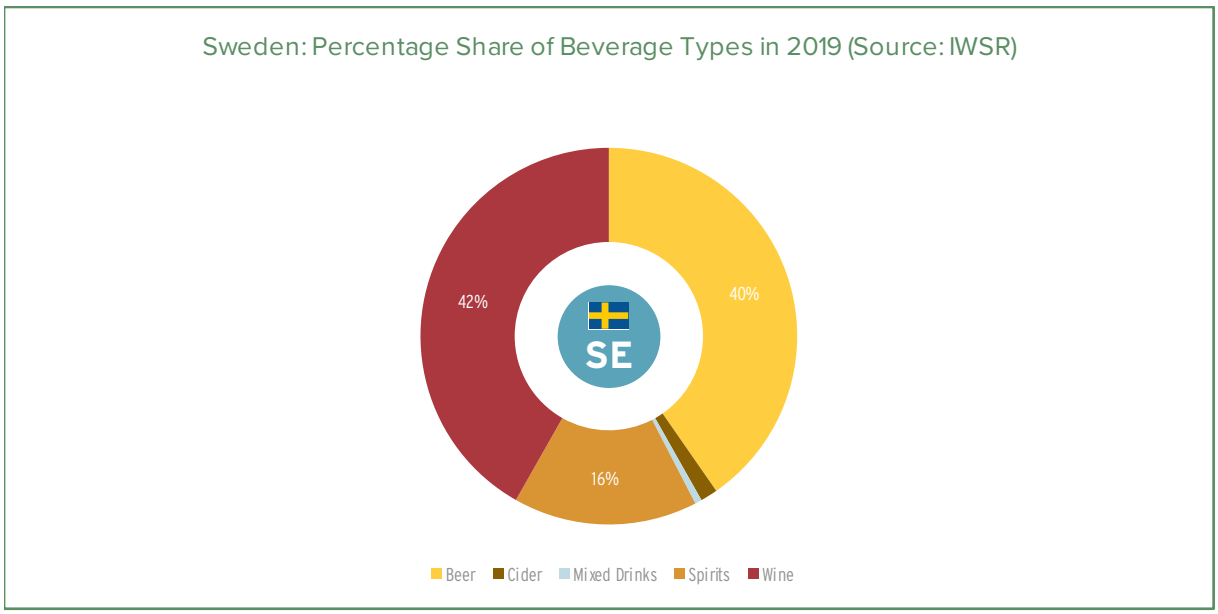
Figure 10: source (The IWSR – drinks market analysis)



According to IWSR data, recorded per capita alcohol consumption is slightly declining between 1994 and 2019: -9.2%. This is especially due to the years 1994 and 1995. From 1996 onwards, recorded per capita alcohol consumption remained relatively stable, according to this dataset (see Figure 10). Notice that unrecorded per capita alcohol consumption is not captured by IWSR.

The ranking of preferred beverages in 2019 according to IWSR is the same as the one shown by WHO in 2016, though with slightly different percentage shares: wine (42%) is closely followed by beer (40%) and spirits drink's share of total recorded alcohol consumption amounts to 16% only (see Figure 11).

Figure 11: source (The IWSR – drinks market analysis)



#2 Per capita alcohol consumption levels & trends compared to selected other countries

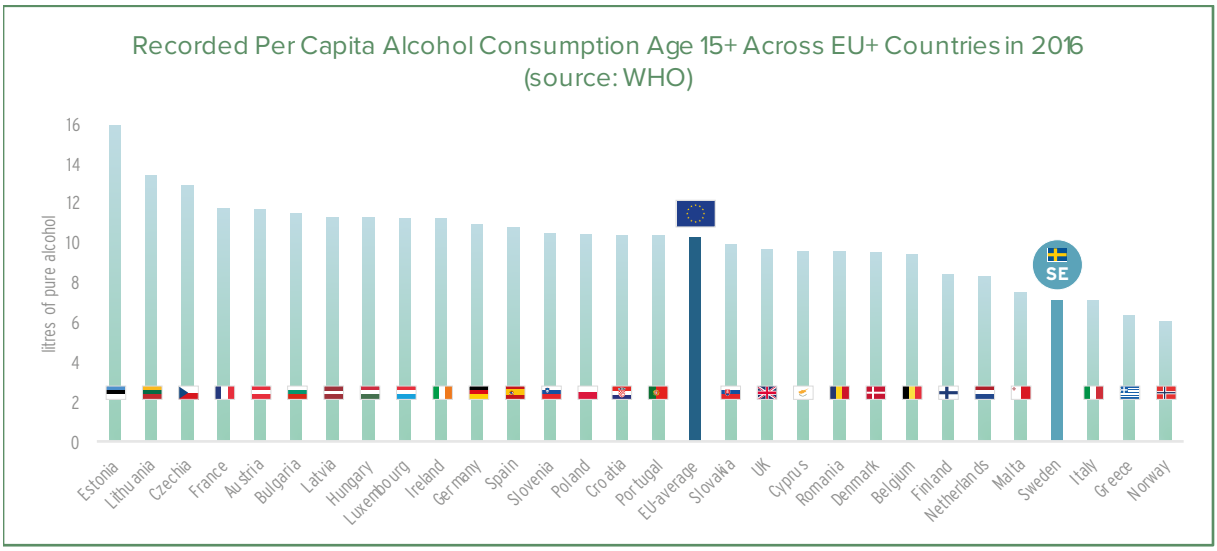
Is the trend in recorded and total per capita alcohol consumption in Sweden unique or are there similar trends in other EU countries? In this chapter, we compare Sweden to those countries that have a similar level of recorded per capita alcohol consumption in 2016 (according to the WHO dataset). These are Finland and Malta (both countries have a slightly higher level in recorded per capita alcohol consumption compared to Sweden) as well as Italy, Greece, and Norway (all countries with a slightly lower level in recorded per capita alcohol consumption in 2016). Interestingly, low levels in recorded per capita alcohol consumption can be observed in a group of Nordic and Mediterranean countries, despite the climate, cultural and alcohol policy differences. According to WHO data, the Netherlands would be close to the recorded per capita alcohol consumption of Sweden as well, but it is further away when looking at IWSR data. Hence, we opted to exclude the Netherlands for the comparative analysis in this document. Moreover, the country ranking as regards total per capita alcohol consumption is similar to the country ranking based on recorded per capita alcohol consumption. Only Greece moves up because unrecorded alcohol consumption makes more than 40% of total alcohol consumption in 2019. Unrecorded consumption in Greece appears to be less driven by legal cross-border shopping but rather by the illicit market. Most likely, these are consequences of the economic crises as well as massive spirits excise duty increases (+125%) after the economic crises.

MAIN FINDINGS

- According to WHO data in 2016, Sweden had the fourth-lowest level in recorded per capita alcohol consumption in the EU+ region. According to IWSR data, Sweden ranks third from the bottom in 2019.
- In all three Nordic countries (Finland, Sweden and Norway), recorded per capita alcohol consumption increased in the 1960s until the mid-1970s.
- While Sweden had the highest level in recorded per capita alcohol consumption in the 1960s and 1970s, the level of recorded per capita alcohol consumption in Finland is consistently above the level of Sweden since 1980. Norway always remained slightly below Sweden's recorded per capita alcohol consumption level between 1961 and 2016.
- Malta's recorded per capita alcohol consumption level was below Sweden's from the 1960s to the late 1980s. Since then, the trend for both countries followed a similar path, though Malta's level is now slightly above Sweden's recorded per capita consumption level.
- While recorded per capita alcohol consumption in Greece did not change dramatically over the last decades, the recorded level in Italy declined drastically. Both countries, Greece and Italy, were slightly below Sweden's recorded level in 2016.
- Most interestingly, a convergence of recorded per capita alcohol consumption levels can be observed between Nordic countries (Finland, Sweden and Norway) and Mediterranean countries (Malta, Italy and Greece).

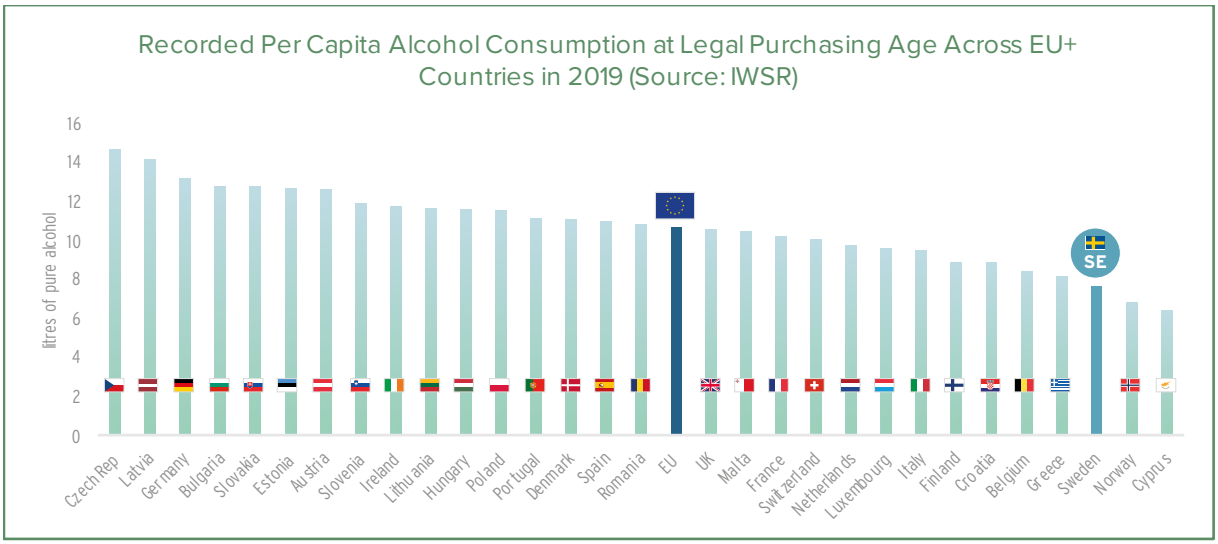
How does Sweden's recorded per capita alcohol consumption level compare to other European countries? According to WHO, Sweden's recorded per capita alcohol consumption level was below the EU+ average in 2016 and ranks fourth from the bottom (see Figure 12).

Figure 12: source (WHO – https://www.who.int/data)



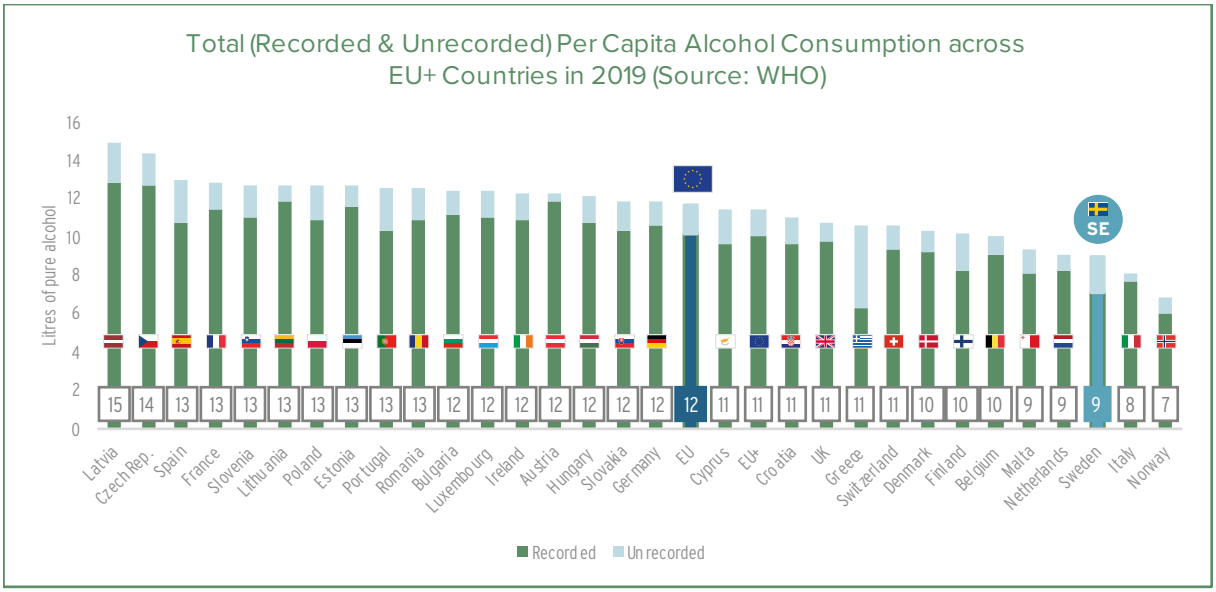
The picture is similar in 2019, according to the IWSR – drinks market analysis dataset, based on legal purchasing age (see Figure 13): Sweden ranks third from the bottom.

Figure 13: source (The IWSR – drinks market analysis)



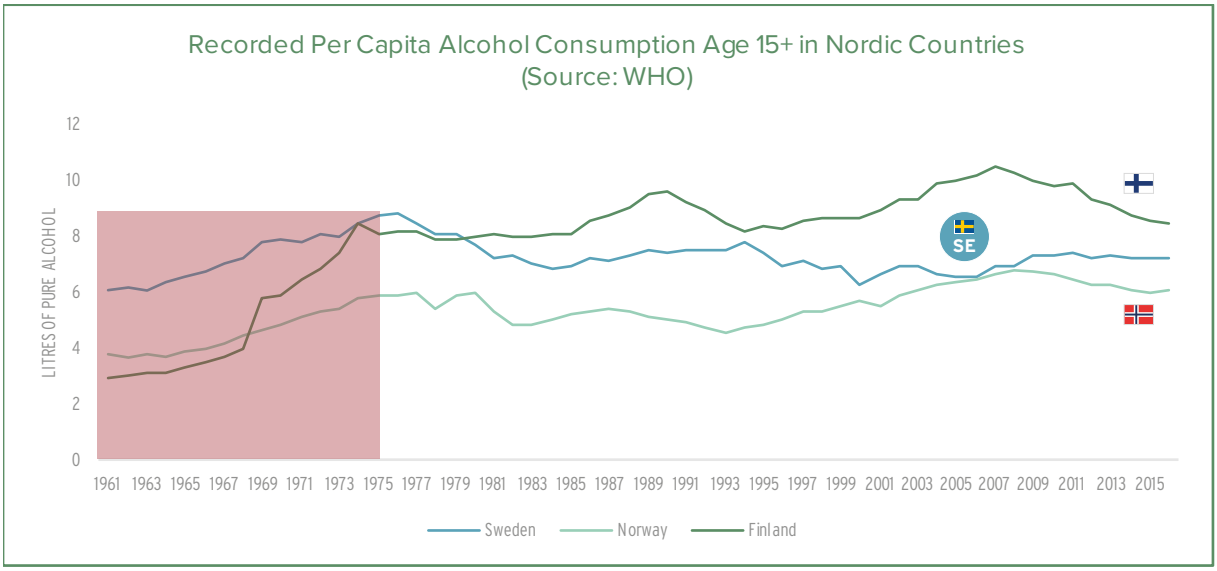
Despite the relatively large share of unrecorded alcohol consumption in Sweden (21% of total alcohol consumption) in 2019, Sweden still ranks third from the bottom of EU+ countries as regards total per capita alcohol consumption. In other words, the ranking of countries based on total per capita alcohol consumption does not significantly differ from the ranking based on recorded per capita alcohol consumption. Only Greece moved up, since unrecorded alcohol consumption appears to have exploded in Greece and makes more than 40% of total alcohol consumption in 2019, possibly due to the economic crises and massive hikes in spirits excise duties (+125%) (see figure 14).

Figure 14: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption)



How does Sweden's recorded per capita alcohol consumption trend compare to Finland and Norway? (see Figure 15).

Figure 15: source (WHO – https://www.who.int/data)



Recorded per capita alcohol consumption increased in all three countries in the 1960s until the mid/end-1970s.

In Finland recorded per capita alcohol consumption continuously increased until 2007 (apart from 4 years in the early 1990s), which also marks the highest peak, followed by the second highest peak in 1990. Since 2007, recorded per capita alcohol consumption in Finland is in decline. However, the level of recorded per capita alcohol consumption is consistently above the level of Sweden's since 1980.

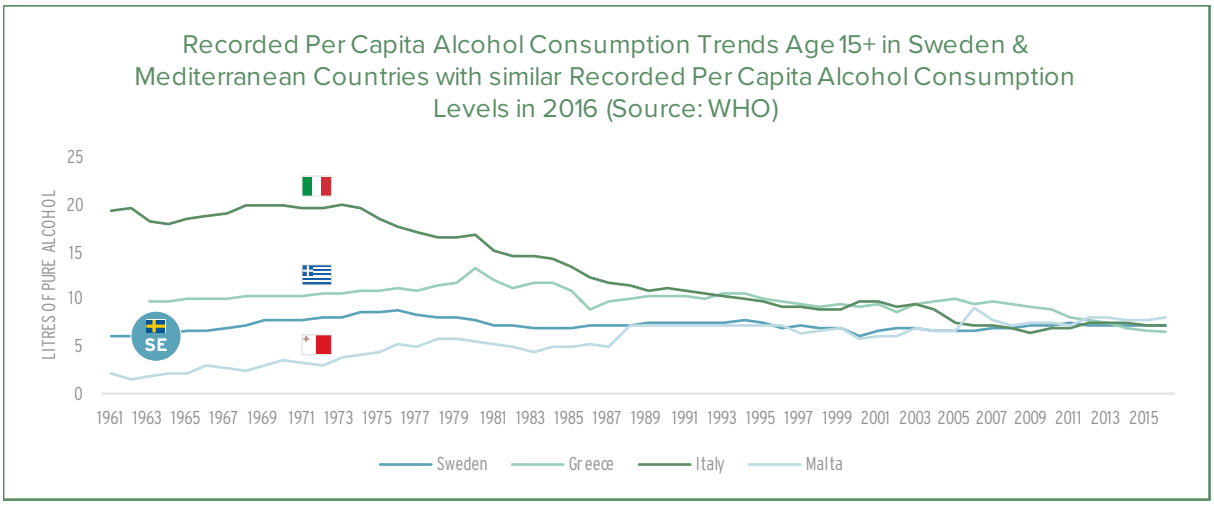
In Norway, recorded per capita alcohol consumption increased not only in the 1960s but also between 1993 and 2008. Recorded per capita alcohol consumption in Norway reached almost the same level as in Sweden in the early 2000s but always remained below Sweden's recorded per capita consumption level.

It is interesting to see that in the 1960s, recorded per capita alcohol consumption level was the lowest in Finland while it had the highest level of recorded per capita consumption since 1980 compared to its Nordic neighbours, Sweden and Norway.

In 2016, the recorded per capita alcohol consumption level in Malta is slightly above Sweden's level while Italy and Greece are slightly below Sweden's recorded per capita alcohol consumption level, according to WHO data (see Figure 12 & 16).

The biggest declining trend in recorded per capita alcohol consumption can be observed for Italy, followed by Greece. Starting from its lowest level in 1961, an increasing trend can be observed for Malta until 2016.

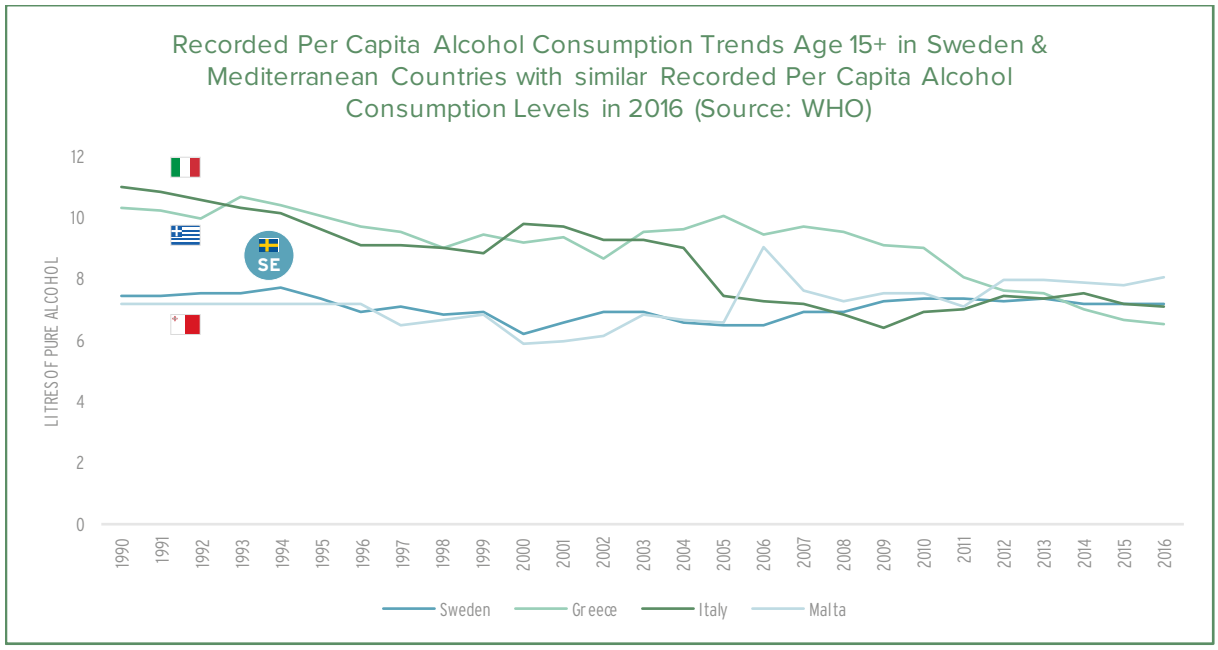
Figure 16: source (WHO – https://www.who.int/data)



The trend in Malta and Sweden is very similar since the late 1980s. Most interestingly, a convergence of recorded per capital alcohol consumption levels can be observed among Mediterranean countries and Sweden: Greece, Italy and Malta had a similar level of recorded per capita consumption as Sweden in 2016 (see Figure 17).

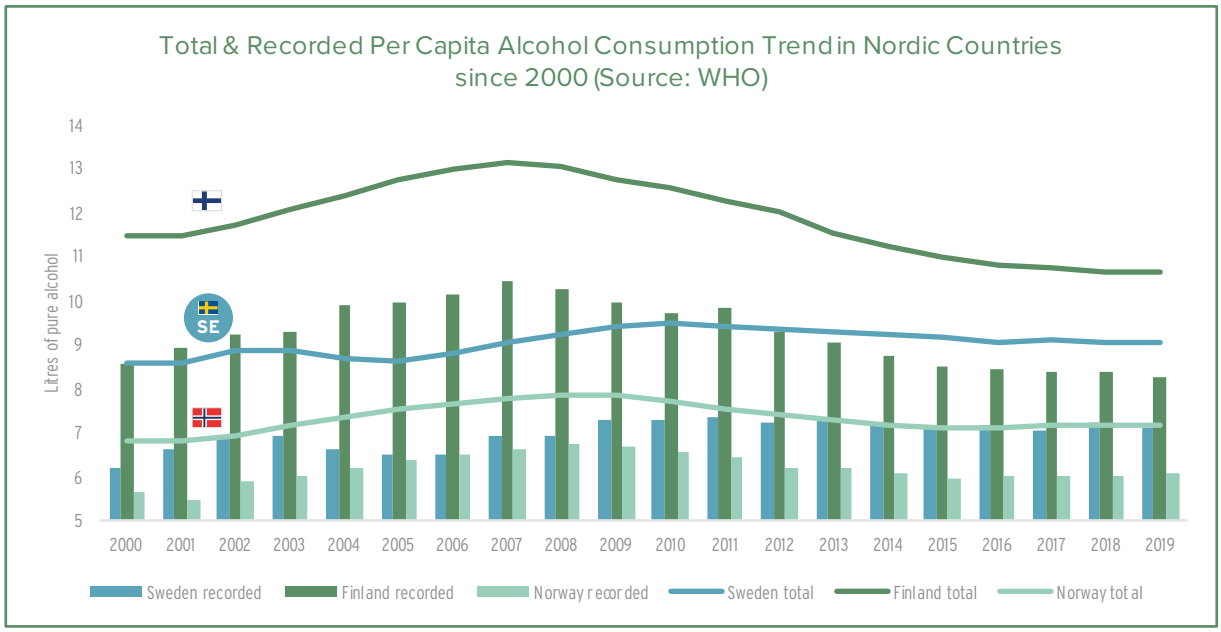
While the gap in recorded per capita alcohol consumption in the 1960s between the country with the lowest and highest level amounted to more than 15 litres of pure alcohol (see figure 16), the gap narrowed to around 4 litres in the 1990s and reached 1.5 litres in 2016 (see figure 17).

Figure 17: source (WHO – https://www.who.int/data)



Now, a look at more recent trends in total per capita alcohol consumption (data is only available from 2000 onwards) reveals that total consumption follows a similar trend as recorded per capita alcohol consumption in Nordic countries. The top-down ranking as regards total per capita alcohol consumption among Nordic countries is the same as for recorded alcohol consumption: Finland, Sweden, Norway. In Sweden, total per capita alcohol consumption remained relatively stable: moving from 8.6 litres in 2000, peaking in 2010 at 9.5 litres and reaching 9 litres in 2019. Total per capita alcohol consumption in Finland started at a higher level in 2000 (11.5 litres), peaked in 2007 and 2008 at 13.1 litres and dropped to 10.6 litres in 2019. In Norway, total per capita alcohol consumption started at the lowest level in 2000 (6.8 litres), peaked in the years 2007 to 2009 at 7.8 litres and fell to 7.1 litres in 2019. Notice that the scale starts with 5 litres in figure 18 because otherwise no peaks become visible, especially for Sweden and Norway, since the changes are not that large.

Figure 18: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption)

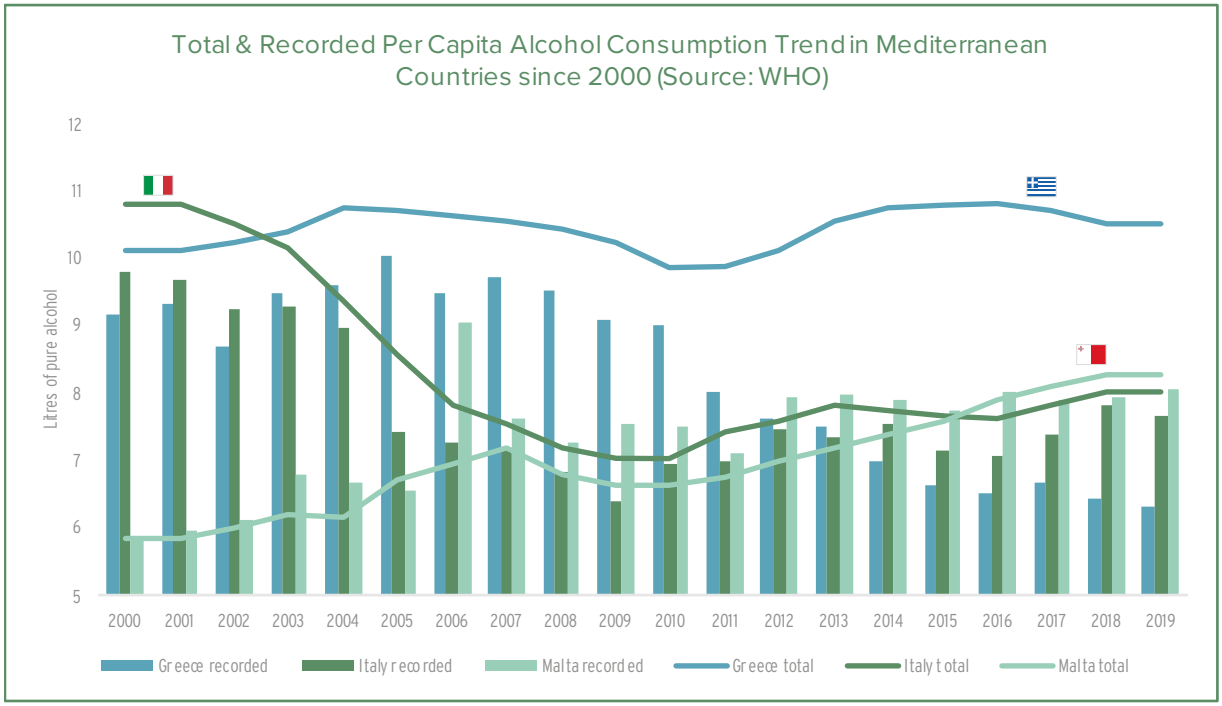


In Greece, total per capita alcohol consumption peaked once in 2004 and then again in 2015 and 2016 at 10.8 litres. In 2019, total per capita consumption (10.5 litres) is still slightly above the level in year 2000 (10.1 litres). The significant decline in recorded per capita alcohol consumption after 2008 from 9.5 litres to 6.3 litres was compensated by the increase in unrecorded alcohol consumption. While the level of recorded per capita alcohol consumption in Greece is below Sweden's level in 2019, total alcohol consumption in Greece exceeds the level in Sweden.

In 2000, total per capita alcohol consumption in Italy was higher compared to Greece and Malta, as well as Sweden, and dropped most significantly afterwards. Total per capita alcohol consumption in Italy reached the lowest level in 2009 and 2010 at 7 litres and subsequently increased to 8 litres in 2019, which is the second lowest level among the selected countries (only in Norway, the level of total per capita alcohol consumption is even lower in 2019). It is interesting to see that the share of unrecorded alcohol consumption in Italy is changing over time, but total consumption more or less follows the trend of recorded per capita alcohol consumption, similar to the Nordic countries, and is below Sweden's level in 2019.

Total per capita alcohol consumption is increasing in Malta, starting at the lowest level in 2000 (5.8 litres) among all the countries selected in this report and reaching its peak in 2019 (8.3 litres), meaning that Malta still ranks below Sweden. Notice that recorded per capita alcohol consumption is sometimes above the value for total per capita alcohol consumption in Malta, according to WHO data. In other words, this data appears to be incorrect. Notice also that the scale starts at 5 litres to make trends more visible in the chart.

Figure 19: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption)



Though outdated, the latest available survey on drinking patterns (Eurobarometer 20102), shows that the vast majority of consumers are moderate drinkers (following governmental drinking guidelines) in all selected countries, though with a significantly higher proportion in Mediterranean countries. The respective data was collected in 2009.

Figure 20: source (Special Eurobarometer (2010) EU citizens' attitudes towards alcohol. 331 / Wave 72.3 – TNS Opinion & Social)

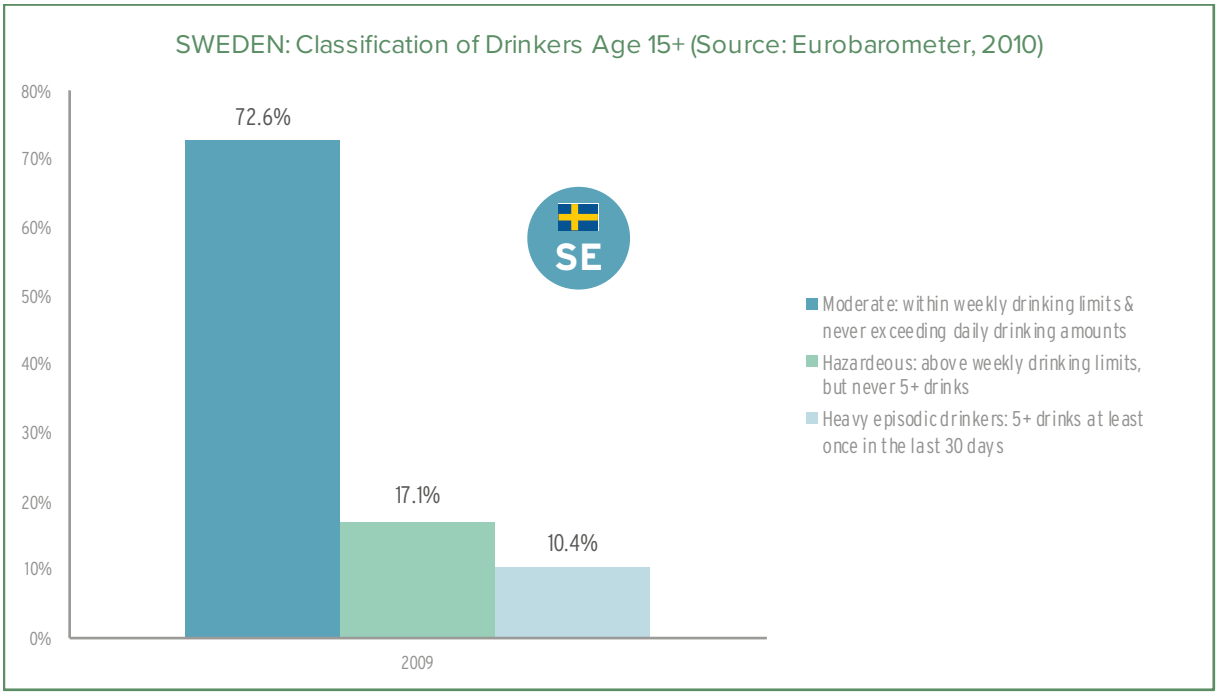
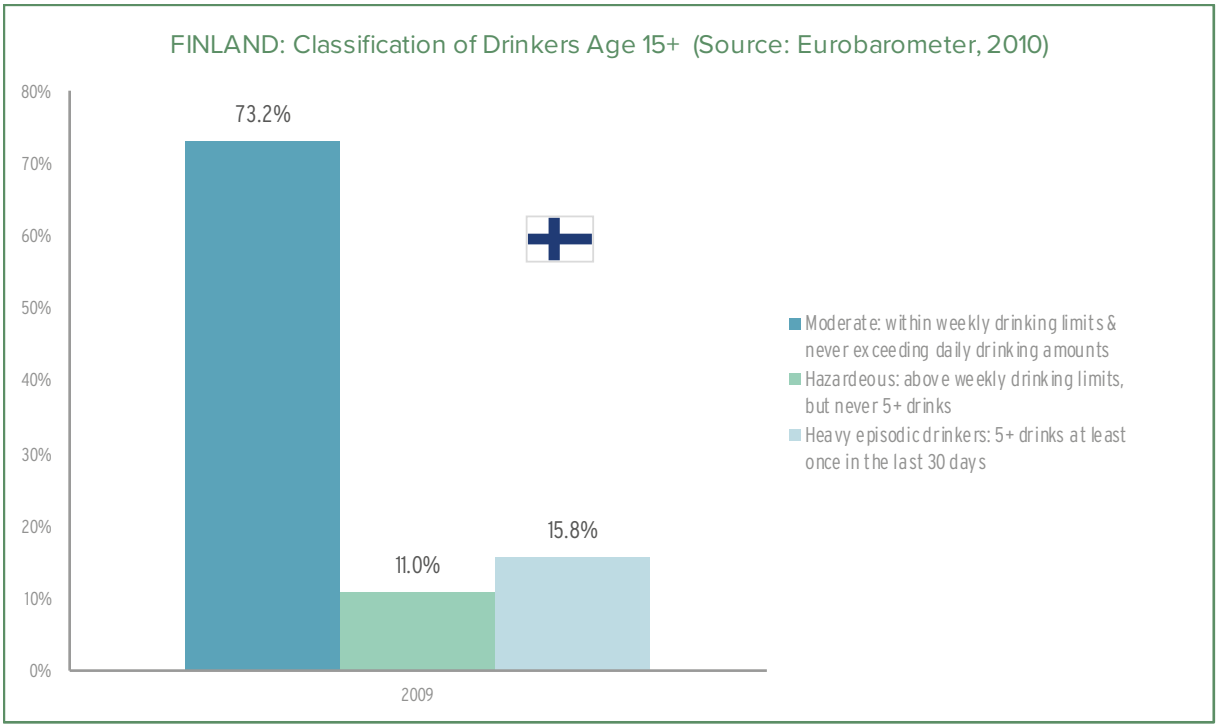


Figure 21: source (Special Eurobarometer (2010) EU citizens' attitudes towards alcohol. 331 / Wave 72.3 – TNS Opinion & Social)



In Sweden and Finland, the proportion of moderate drinkers is very similar (73%), but heavy episodic drinking is more common in Finland compared to Sweden.

In Greece, almost 90% are moderate drinkers and only 2% reported at least one heavy episodic drinking occasion. In Italy, the proportion of moderate drinkers reached almost 95% in 2009 and 0.3% reported at least one heavy episodic drinking occasion.

Figure 22: source (Special Eurobarometer (2010) EU citizens' attitudes towards alcohol. 331 / Wave 72.3 – TNS Opinion & Social)

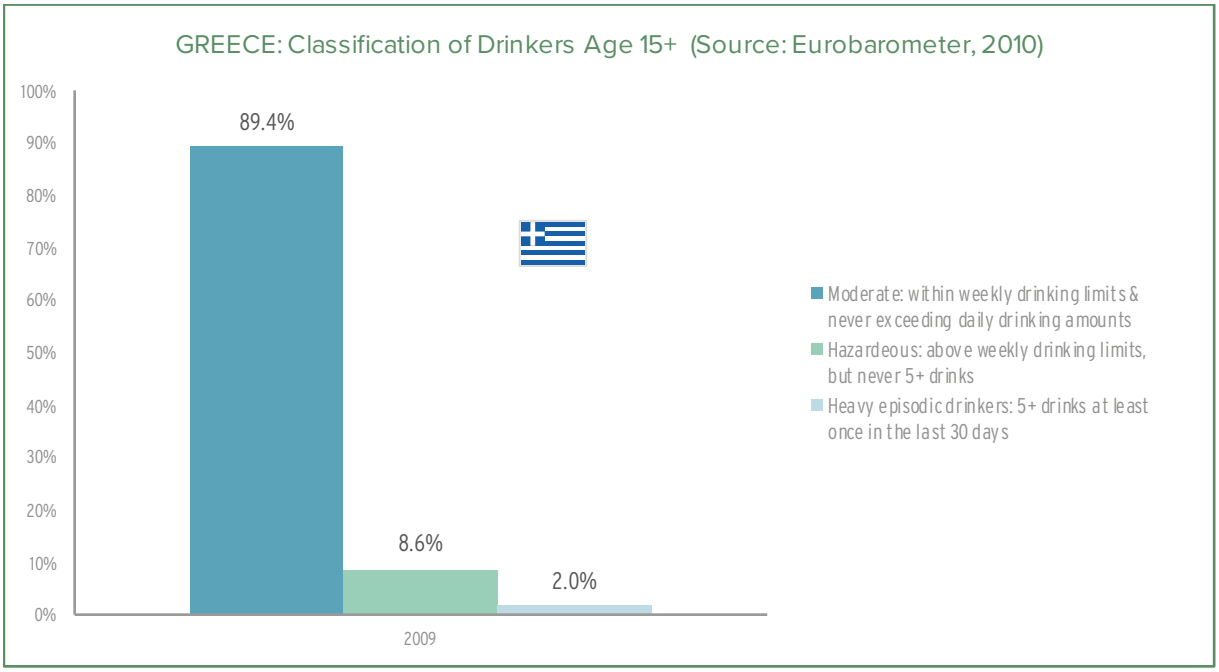
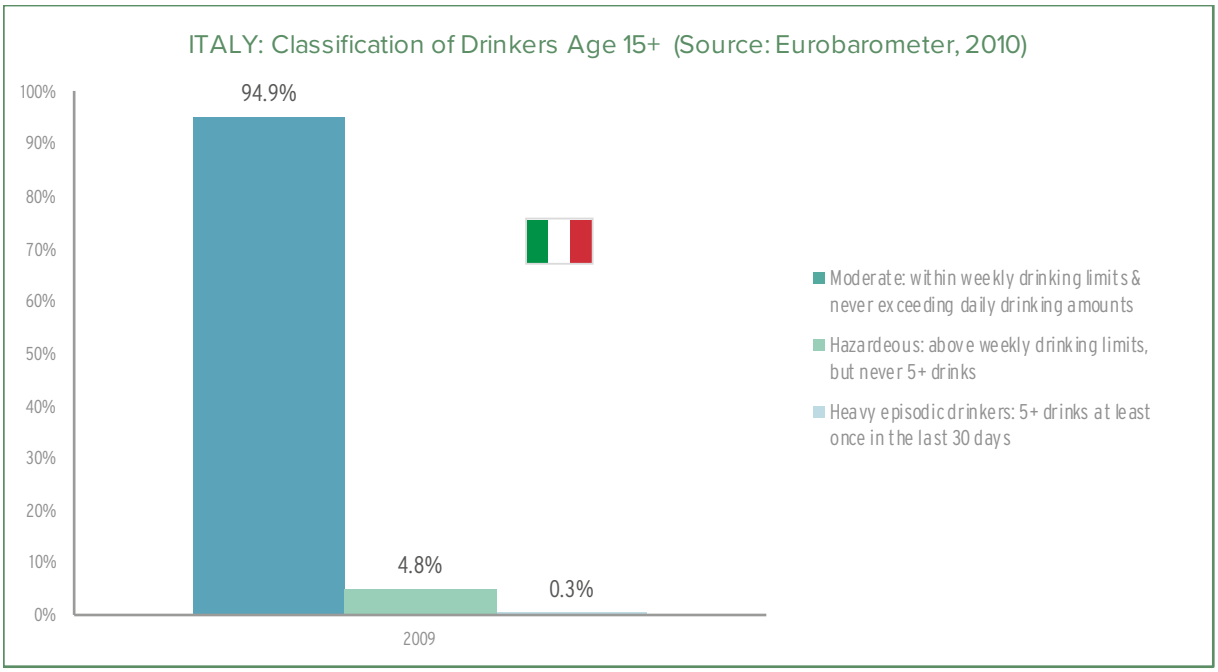


Figure 23: source (Special Eurobarometer (2010) EU citizens' attitudes towards alcohol. 331 / Wave 72.3 – TNS Opinion & Social)



#3 Per capita alcohol consumption & income trends in Sweden

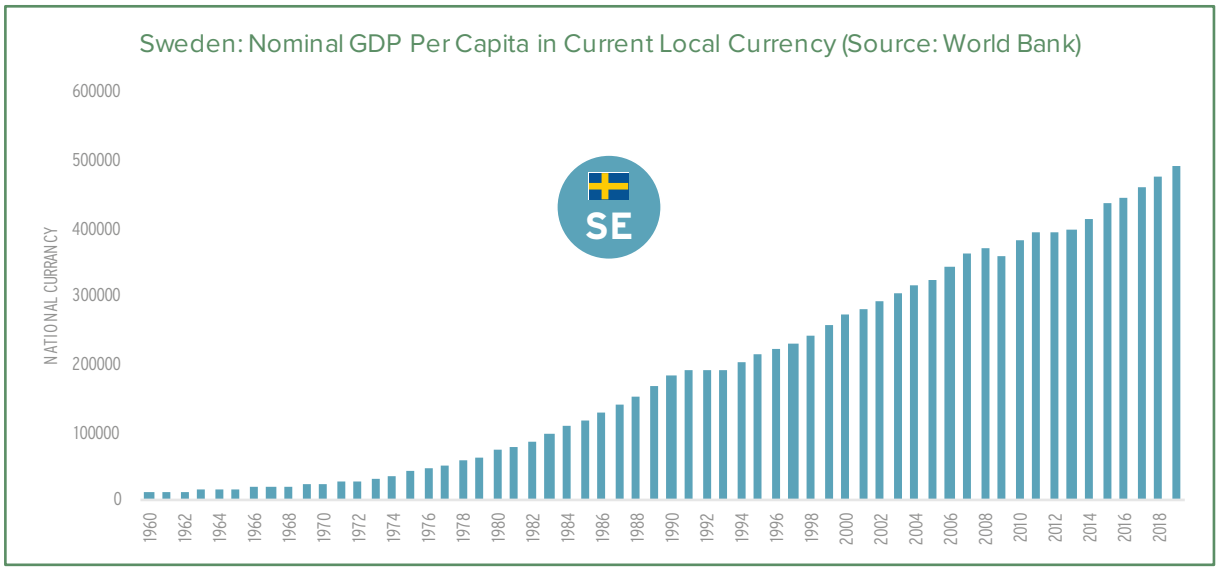
It is often argued that the higher the price for alcoholic beverages, the lower the level in per capita alcohol consumption. This refers to the standard economic 'law of demand': the higher the price of a commodity, the lower the quantity demanded. Moreover, prices for alcoholic beverages can be influenced by price policy measures, such as taxation, banning alcohol sales below costs, or minimum unit prices, etc. for fiscal or health reasons. However, not all factors that impact the affordability of alcoholic beverages can be easily modified, such as inflation or disposable income. An important element that needs to be included in the equation is people's income. Here we are interested in the affordability and affordability changes of alcoholic beverages over time.

MAIN FINDINGS

- World Bank data shows that nominal GDP per capita (used as an indicator for income) massively increased since 1960 in Sweden. In real terms, people earn more than three times as much as they earned in 1960.
- If prices did not catch up with income increases, alcoholic beverages became more affordable over time due to income increases.
- Contrary to our expectation, empirical data shows that recorded as well as total per capita alcohol consumption and income trends do not coincide as predicted in theory: total per capita alcohol consumption level today is below the peak in 2004 (according to CAN data) or 2010 (according to WHO data) even though real GDP per capita is higher compared to back then, and hence, alcohol affordability has increased.

The presumably best indicator for people's income would be disposable income, split by different income groups. Long-term disposable income data was not readily available. Therefore, this chapter uses a second-best indicator that is available for longer trends, namely GDP per capita by the World Bank.

Figure 24: source (World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD)



Nominal GDP per capita is constantly increasing in Sweden (see Figure 24). Nominal GDP per capita is almost 45 times higher in 2019 compared to 1960; more than 20 times higher compared to 1970; almost 7 times higher compared to 1980; or almost 3 times higher compared to 1990. Notice that nominal GDP per capita is not inflation rate adjusted.

Figure 25: source (World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD & https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG)

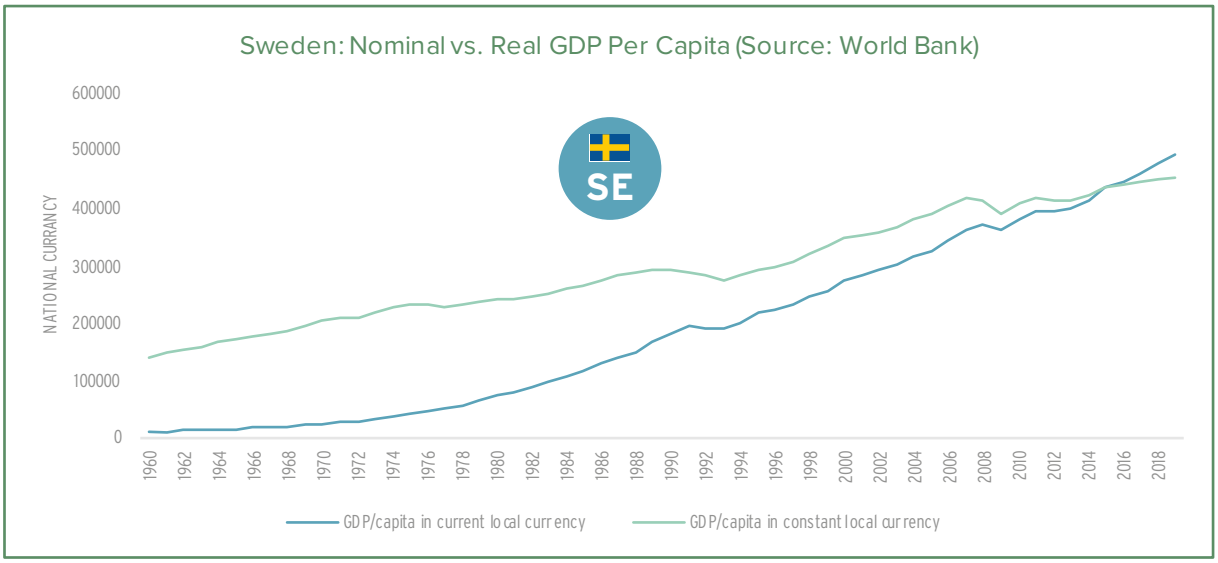


Figure 25 compares nominal to real GDP per capita (that is, inflation rate adjusted) for Sweden. While some periods can be spotted where real GDP per capita declined, overall, also real GDP per capita has increased in Sweden and reached its peak in 2019. Today, GDP per capita is more than 3 times the amount compared to 1960; more than twice compared to 1970; almost twice compared to 1980 or more than 1.5 times the amount compared to 1990. Since nominal GDP per capita is on a constant increase in Sweden between 1960 and 2019, it does not adequately explain the trend in recorded per capita alcohol consumption, because we see ups and downs. Perhaps, real GDP per capita, used as an indicator for income, is a better indicator to explain the trend in recorded per capita alcohol consumption. Now, how does real GDP per capita associate to recorded per capita alcohol consumption in Sweden?

Figure 26: source (World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD & WHO – https://www.who.int/data)

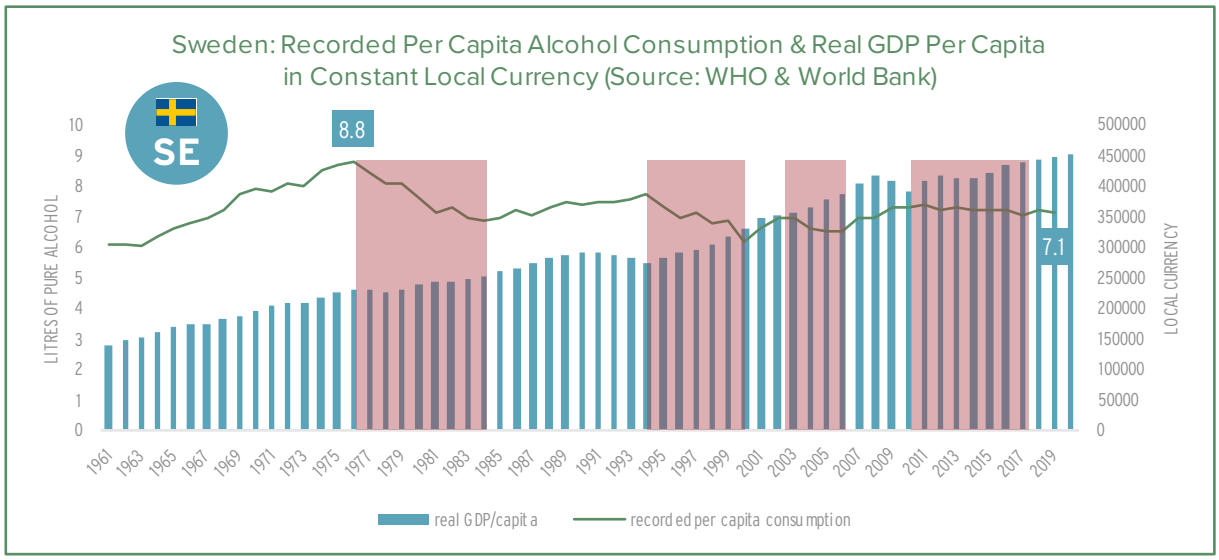


Figure 26 shows some periods between 1960 and 2019 where the increase in income coincided with an increase in recorded per capita alcohol consumption, but also periods where an increase in real income coincided with a declining trend in recorded per capita alcohol consumption. There is no clear link between real GDP per capita and per capita alcohol consumption in Sweden. Despite the massive increase in alcohol affordability due to the increase in income (under the assumption that prices for alcoholic beverages did not increase by the same level, see chapter 4), recorded per capita alcohol consumption remained relatively stable in the last decades (declined, if the peak in 1976 is taken as a reference point or slightly increased if 1961 is selected as the reference point) in Sweden (see Figure 26). Between 2009 and 2016, recorded per capita alcohol consumption remained relatively stable, between 7.2 litres to 7.3 litres per capita. Within this range also fall the years 1995, 1988, 1986, 1982, and 1968. Compared to 2016, the alcohol affordability (if we ignore price changes for the moment) varied for the respective years, as can be seen in the table below.

Table source (World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD)

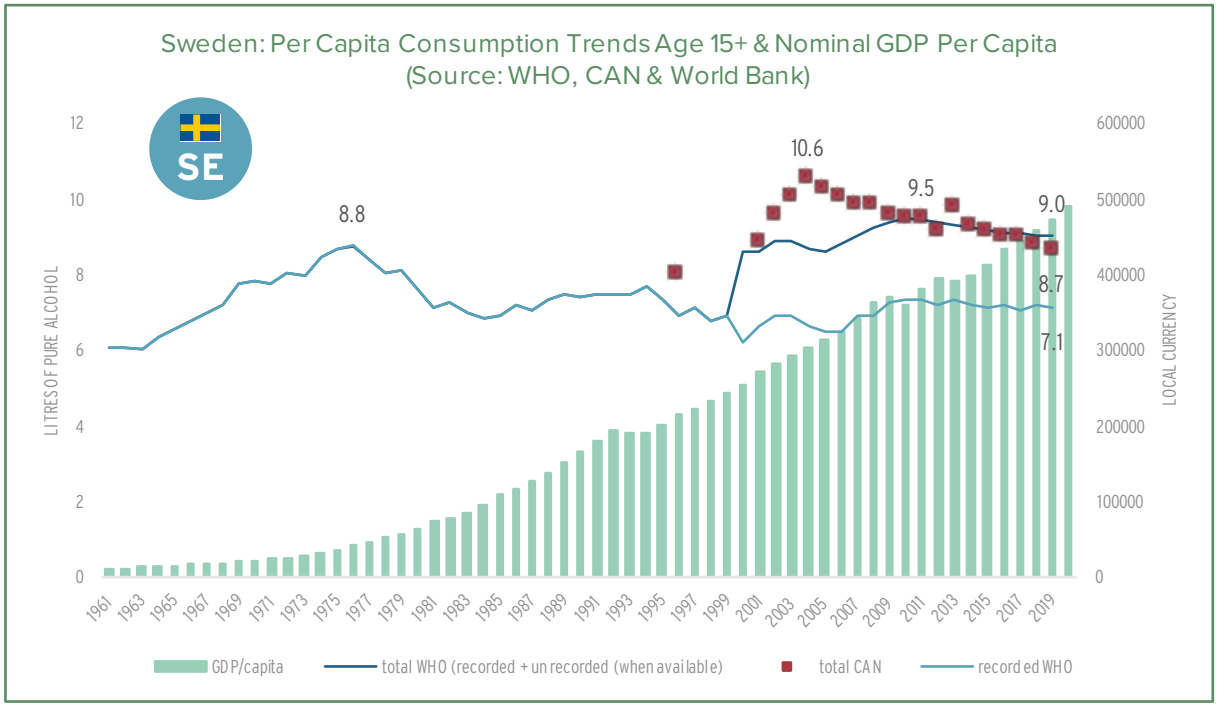
Year	1968	1982	1986	1988	1995	2009	2010	2011	2012	2013	2014	2015
Affordability difference to 2016	-57.6%	-44.0%	-37.9%	-34.7%	-33.3%	-11.4%	-6.9%	-4.6%	-5.9%	-5.6%	-4.0%	-0.8%

The table shows years where recorded per capita alcohol consumption was at the same level (between 7.2 and 7.3 litres of pure alcohol) in Sweden, but since real GDP per capita increased over time, alcoholic beverages were less affordable the longer you go back in time, compared to 2016.

In 1976, when recorded per capita alcohol consumption peaked, alcoholic beverages were far less affordable compared to 2019, as GDP per capita almost doubled (while recorded per capita alcohol consumption dropped to 7.1 litres). If we compare 1976 to 1995, when Sweden joined the EU, we see a drop in recorded per capita alcohol consumption of 17% (from 8.8 litres to 7.3 litres) and at the same time real income increased by 26%.

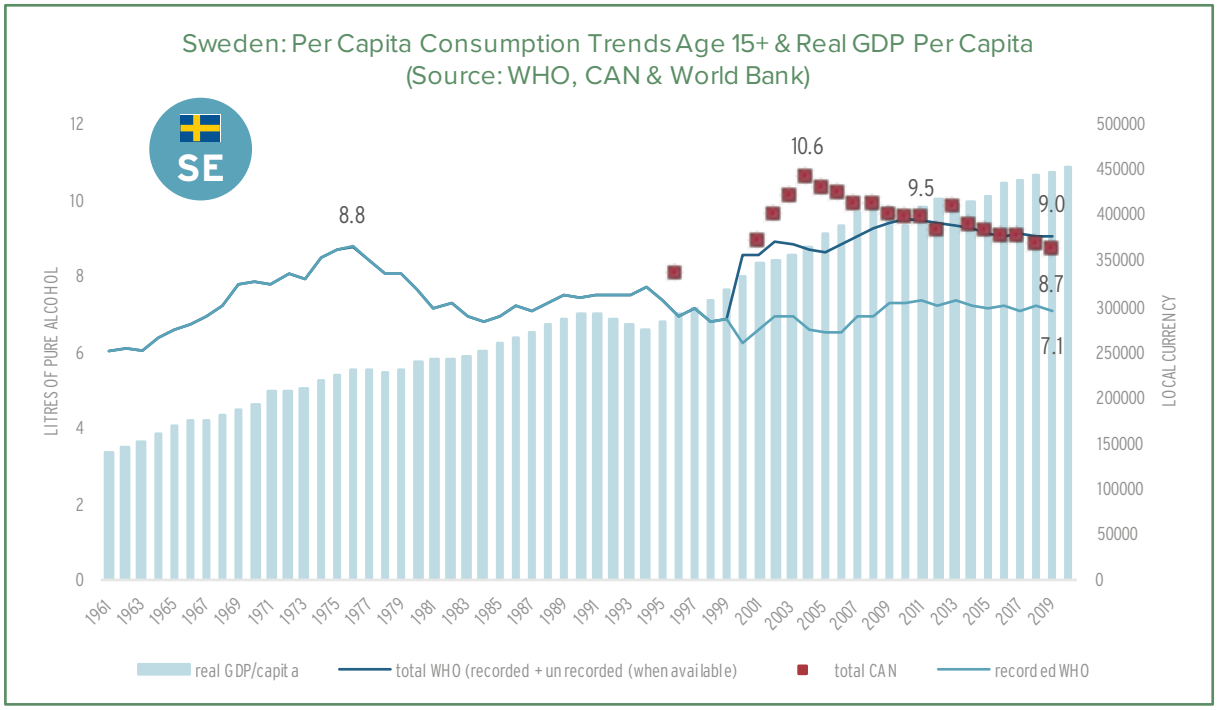
Notice, however, that figure 26 compares real GDP per capita to recorded per capita alcohol consumption only, which may be accurate before 1995, but not afterwards, when Sweden joined the EU and when estimates for unrecorded per capita alcohol consumption data are available. Therefore, a closer look at nominal/real GDP per capita and total per capita alcohol consumption trends is important for further clarification. The following was added in December 2021, when more data on per capita (recorded and total) alcohol consumption was available by WHO compared to the date, when this report was commissioned.

Figure 27: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf) & World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD)



A growth in nominal GDP per capita coincides with a growth in total (recorded and unrecorded) per capita alcohol consumption at least between 2000 and 2004 (according to CAN data). However, nominal GDP per capita continues to increase until 2019, which coincides with a decline in total per capita alcohol consumption (according to CAN data from 2004 onwards and according to WHO data from 2010 onwards). This declining trend in total per capita alcohol consumption from 2004 onwards (according to CAN) or 2010 onwards (according to WHO) is interesting, not only because nominal GDP per capita is growing at the same time, but also because unrecorded alcohol is expected to be less costly, as it consists of cross-border shopping, home production, alcoholic beverages from the illicit market, etc. However, as stated above, nominal GDP per capita is constantly increasing, is not inflation rate adjusted and therefore, real GDP per capita is expected to be a more appropriate indicator to explain the trend in total per capita alcohol consumption (a significant share of total per capita alcohol consumption comes from unrecorded sources, such as cross-border shopping, after Sweden joined the EU).

Figure 28: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf) & World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD)



Based on CAN data, total per capita alcohol consumption peaked in 2004 and declined between 2004 and 2019. This decline in total per capita alcohol consumption occurred even though not only nominal but also real GDP per capita was always higher in each year after 2004, meaning that alcoholic beverages became more affordable under the assumption that prices for alcoholic beverages in Sweden and those imported to Sweden did not increase at the same level as real GDP per capita). In 2019, Swedes earned almost 1/5 more compared to the year 2004, but total per capita alcohol consumption was 18% below the 2004 level: it declined from 10.6 litres to 8.7 litres, according to CAN.

In 2018, total per capita alcohol consumption reached 8.8 litres, the same level as in 2001 (according to CAN), which is also the same level when recorded per capita alcohol consumption peaked in 1976. In 2018, however, real GDP per capita almost doubled compared to 1976 and in 2001 it exceeded the level from 1976 by more than 50%! After the peak in total per capita alcohol consumption in 2010 (according to WHO), it slightly dropped by 5% in 2019, which coincided with a 11% increase in real GDP per capita.

In short, alcohol affordability seems to be unrelated to recorded and total per capita alcohol consumption in Sweden. Moreover, one should not forget that total per capita alcohol consumption includes also estimated unrecorded alcohol consumption, often, obtained through legal cross-border shopping, which usually consists of alcoholic beverages that are cheaper than those sold in Sweden. This reinforces the interpretation that per capita alcohol consumption (recorded and total) is rather independent from alcohol affordability. A significant increase in real GDP per capita or income, which made alcoholic beverages far more affordable today than decades ago, plus the opportunity to buy cheaper alcoholic beverage across the board, once Sweden joined the EU, did not result in massive increases in total per capita alcohol consumption.

#4 Trends for alcohol prices, excise duty rates & revenues in Sweden

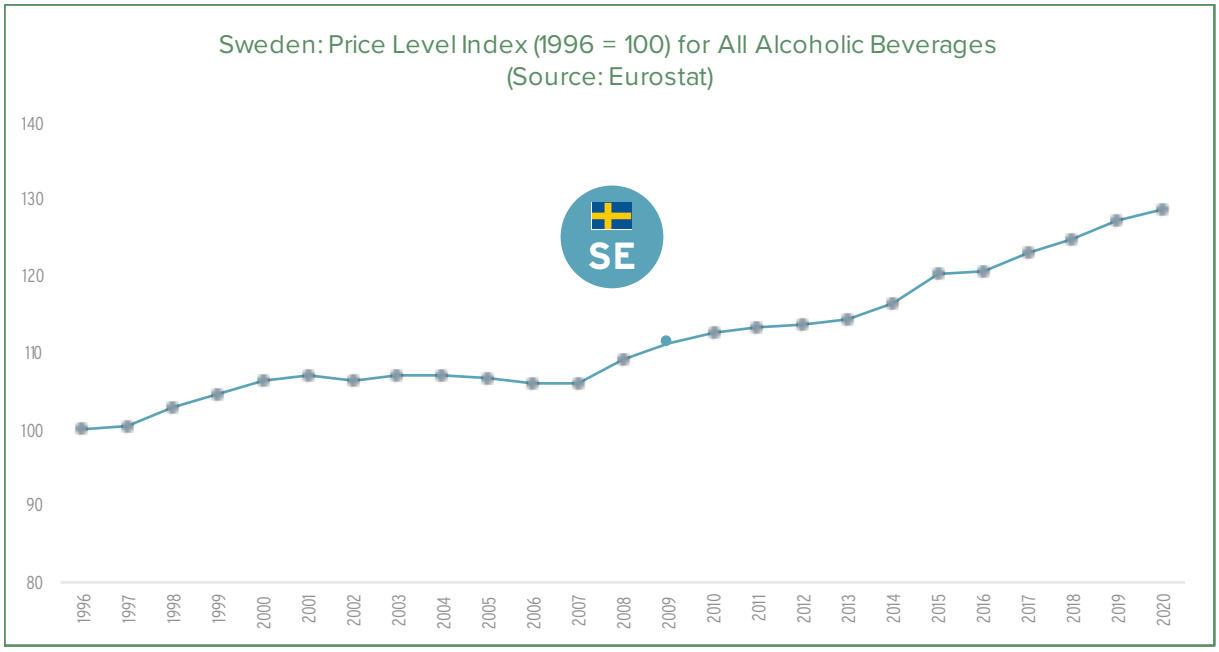
While changes in income are the main drivers for alcohol affordability, excise duties, inflation rates and prices are also factors influencing the affordability of alcoholic beverages. It is often claimed that prices for alcoholic beverages do not correspond to the inflation rate, meaning that real prices for alcoholic beverages are declining. Did prices for alcoholic beverages catch up to the inflation rate? Are real prices for alcoholic beverages declining in Sweden? These are the questions this chapter attempts to address. It will shed some light on prices, excise duties and inflation rates in Sweden over time.

MAIN FINDINGS

- Between 1996 and 2020, prices for alcoholic beverages increased by almost 30%, according to Eurostat data in Sweden.
- The spirits drinks category was the main driver for the general alcoholic beverage price level increase between 1996 and 2010. From 2010 to 2020, wine contributed mostly to the general price level increase.
- Spirits drinks face by far the highest excise duty rate in Sweden. Compared to the spirits excise duty rate in 2020, the excise duty rate for beer is almost 61% lower, the rate for wine is 54% lower and the rate for intermediate products is 41% below the spirits excise duty rate.
- The excise duty rate for beer and wine today is below the rate applied in 1996, whereas the rate for spirits and intermediate products is above the rate applied in 1996.
- Most excise revenues are derived by wine (40%), followed by spirits (30%) and beer (29%) in 2018. However, the sales volumes share differs significantly from the revenue split: wine (42%), beer (40%), spirits (16%). In other words, 16% of total alcohol volume is related to spirits drinks, but revenues generated by spirits drinks amounts 30% of total excise revenues. Beer sales share were 40% and this was responsible for 29% of total excise revenues, whereas wine sales share reached 42%, which was responsible for 40% of total excise revenues.
- The price level for alcoholic beverages constantly increased between 1996 and 2020 above the inflation rate in Sweden. Hence, there were real price increases in Sweden. However, the increase in income was even higher and therefore alcoholic beverages became more affordable.

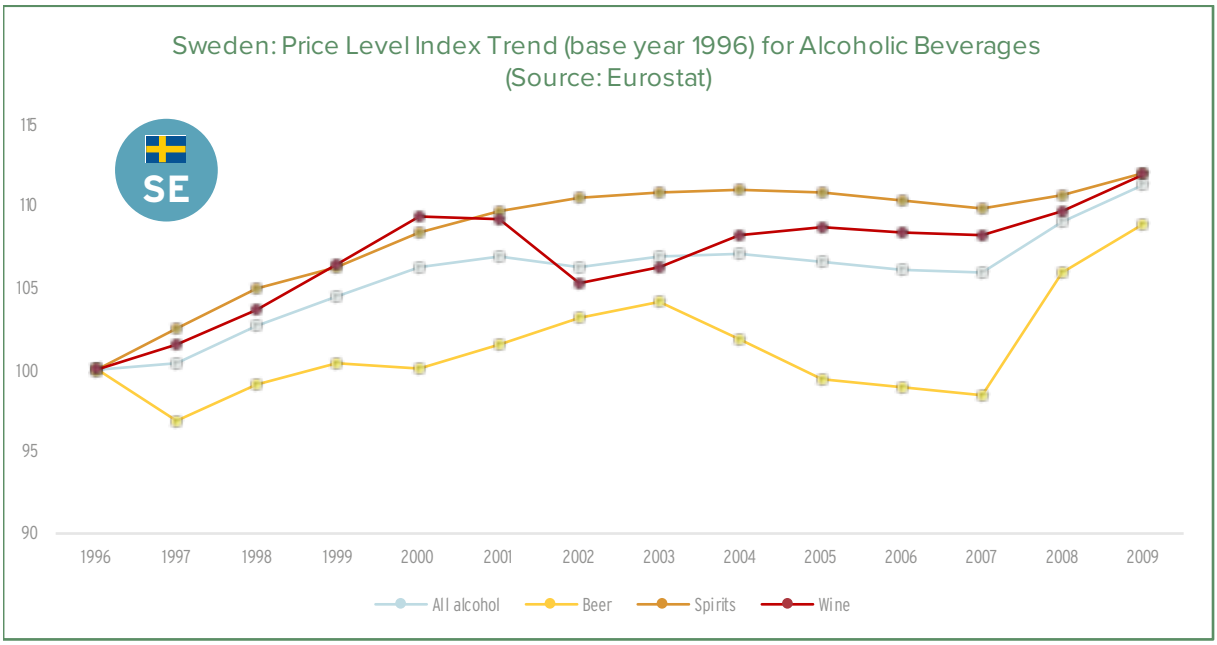
Eurostat provides a price level index for alcoholic beverages starting from the year 1996. The chart illustrates that prices for alcoholic beverages in total increased between 1996 and 2020: almost 30%. (see figure 29).

Figure 29: source (Eurostat – https://ec.europa.eu/eurostat/cache/metadata/en/prc_hicp_esms.htm)



The biggest contributor to the general price level increase for alcoholic beverages was the spirits drinks category, followed by wine between 1996 and 2010 (see figure 30).

Figure 30: source (Eurostat – https://ec.europa.eu/eurostat/cache/metadata/en/prc_hicp_esms.htm)



From 2010 to 2020, the biggest contribution to the general price level increase for alcoholic beverages ('all' in the chart refers to all alcoholic beverages together) was the wine category (see figure 31).

Figure 31: source (Eurostat – https://ec.europa.eu/eurostat/cache/metadata/en/prc_hicp_esms.htm)

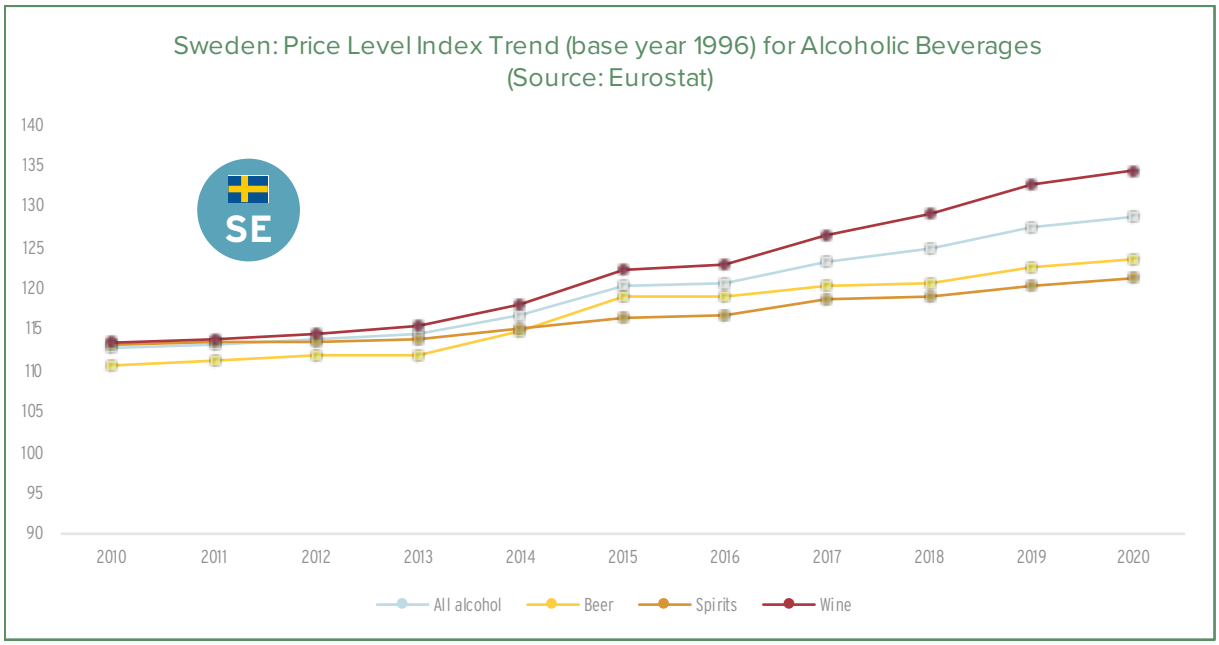
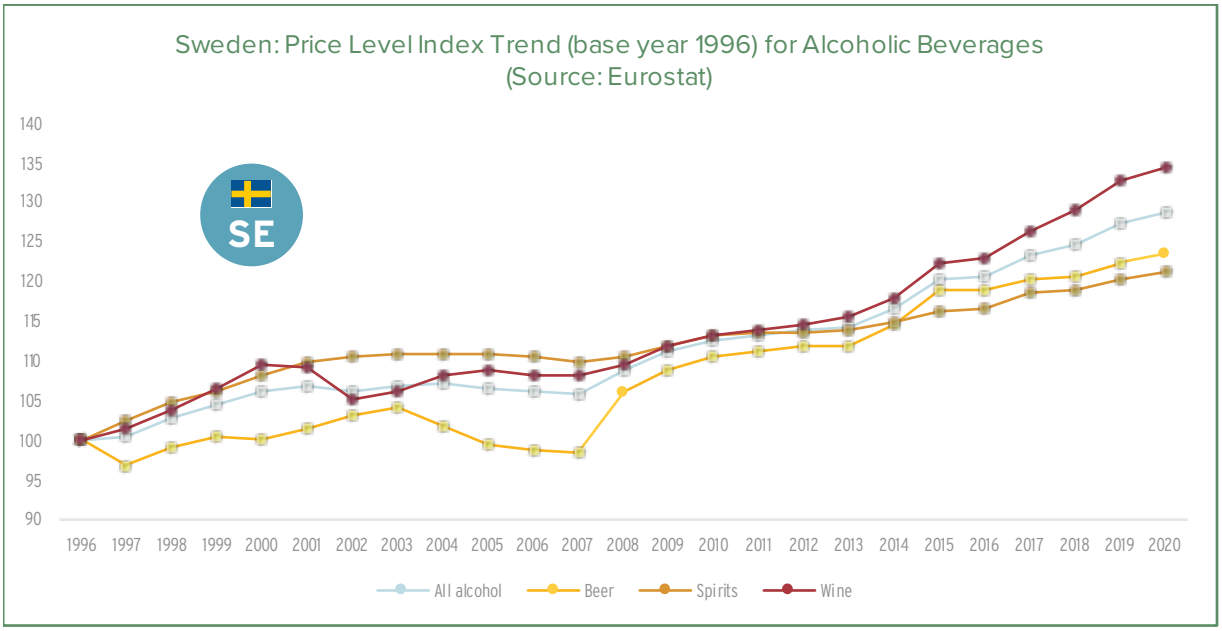


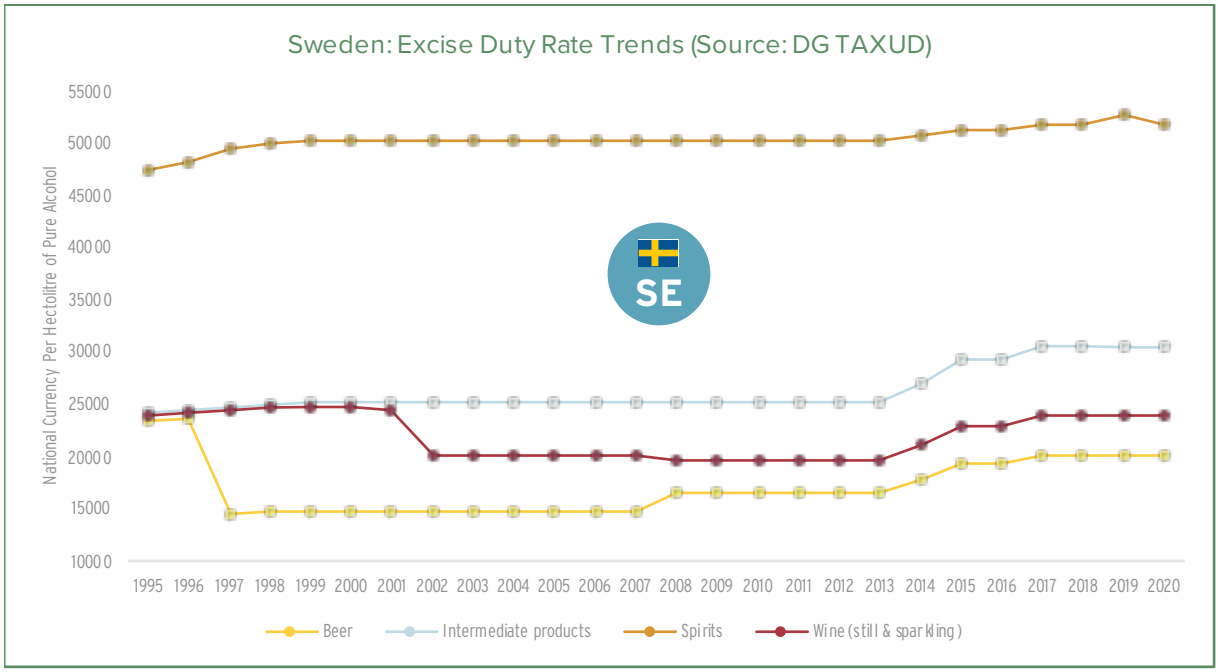
Figure 32 below shows the price level index for different beverage types and all alcohol (all beverage types together) for the entire period from 1996 to 2020.

Figure 32: source (Eurostat – https://ec.europa.eu/eurostat/cache/metadata/en/prc_hicp_esms.htm indexed by the author)



Is the price level index related to excise duty rates? DG TAXUD provides excise duty rates for alcoholic beverages since 1995 (see figure 33).

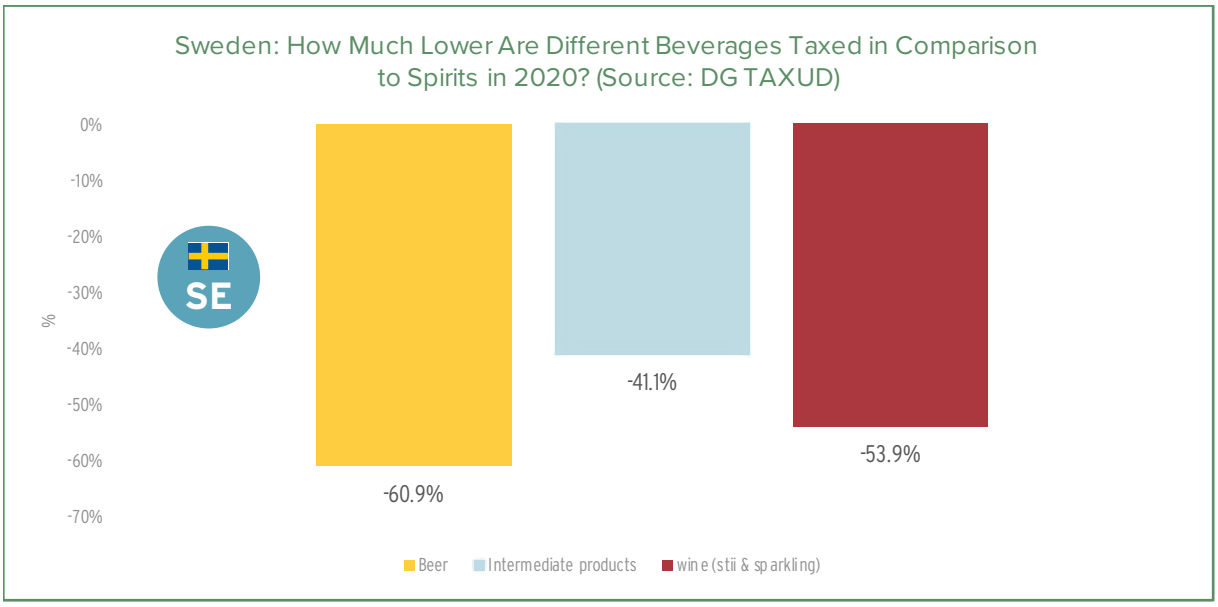
Figure 33: source (DG TAXUD)



Spirits drinks face by far the highest excise duty rate in Sweden. Beer experienced the largest excise rate reduction followed by wine between 1995 and 2020. Interestingly, the excise duty rate for beer and wine in 2020 is below the rate that was applied in 1995 (see figure 33).

Compared to the spirits excise duty rate in 2020, the excise duty rate for beer is almost 61% lower, the rate for wine is 54% lower and the rate for intermediate products is 41% below the spirits excise duty rate (see figure 34).

Figure 34: source (DG TAXUD)

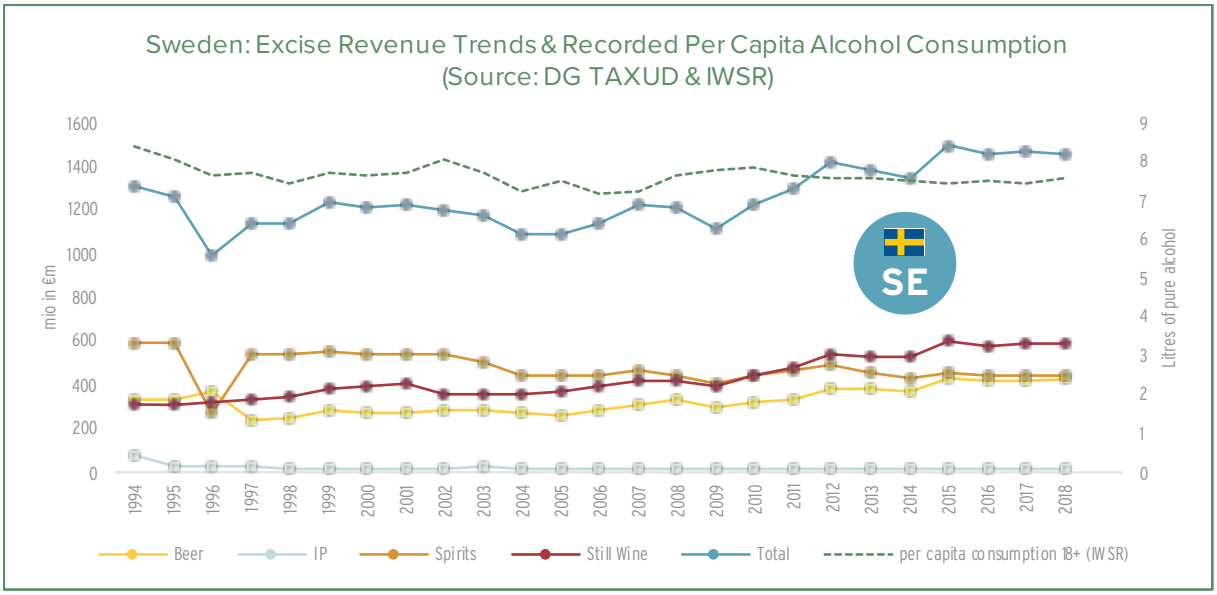


Trends in excise revenues: figure 35 shows that overall excise revenues in Sweden are increasing between 1994 and 2018. While spirits excise duty revenues are slightly declining, wine and beer excise

duty revenues are slightly increasing. Of course, this is not only due to the applied excise duty rates, but also to the recorded sales trends of each category: wine sales are increasing, whereas spirits sales are decreasing.

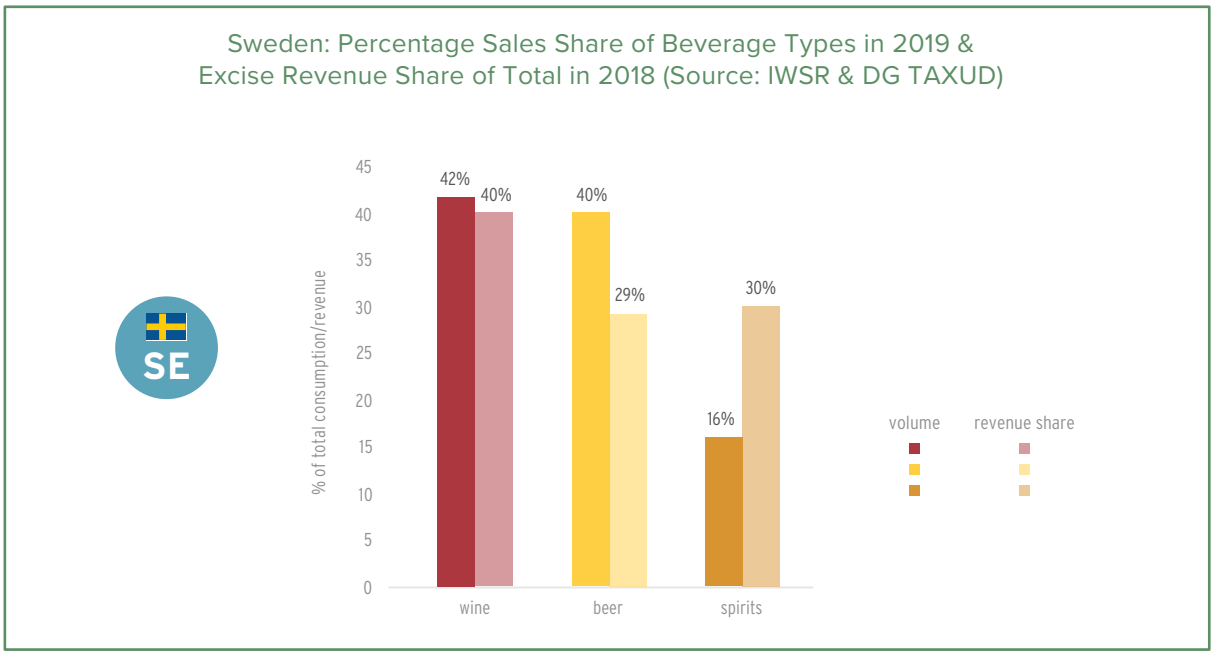
Total excise revenues somehow follow the trend in recorded per capita alcohol consumption from 1994 till the mid- 2000s. Since then, a relatively stable trend in recorded per capita alcohol consumption falls together with increases in total excise revenues, mostly due to recent excise duty increases. Recorded per capita alcohol consumption remains an important factor from a fiscal point of view.

Figure 35: source (DG TAXUD) & The IWSR – drinks market analysis



Where do excise revenues in Sweden come from? Most excise revenues are derived from wine, followed by spirits and beer (see Figure 36). However, this should be compared to the volumes sold of each beverage type.

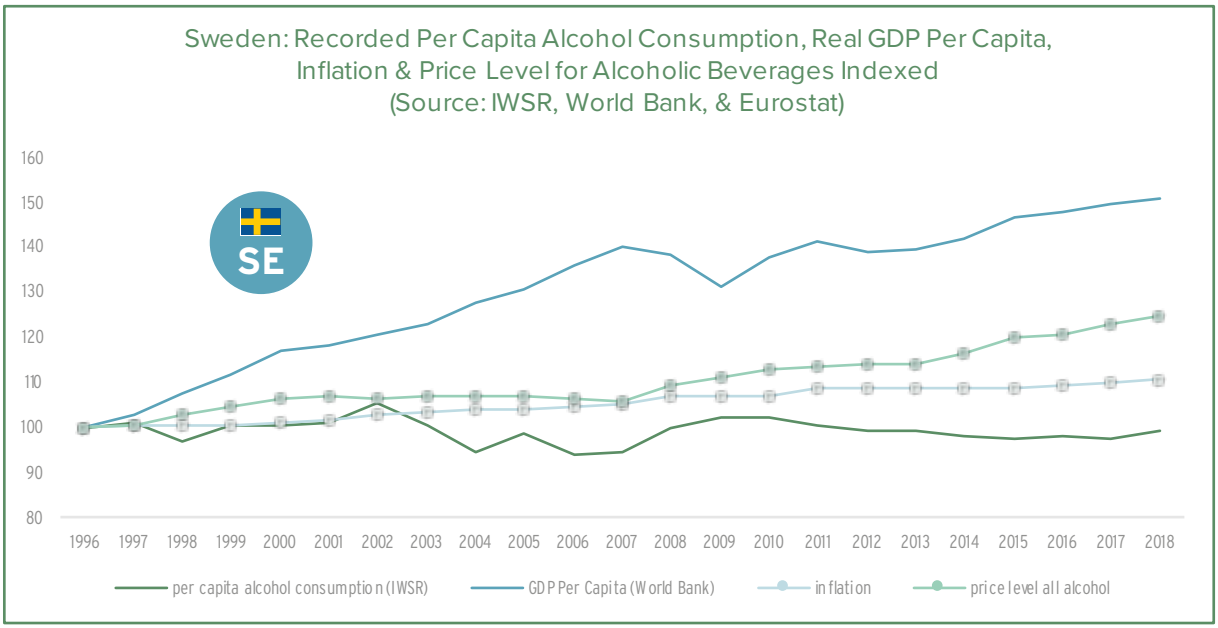
Figure 36: source (The IWSR – drinks market analysis, volume share of the total volume calculated by the author, DG TAXUD – excise revenue share to total calculated by the author)



42% of total recorded alcohol sales in Sweden comes from wine and this beverage type contributes to 40% of total excise revenue collection. Beer holds 40% of the market share in Sweden but contributes only 29% to total excise revenues. Spirits drinks hold only 16% of the market share (significantly less than wine or beer) in Sweden, but spirits excise duty revenues contribute 30% to total excise revenues, 1% more than beer (see figure 36 & figure 11). If excise duties were less discriminatory and fair, the order of excise duty revenue contribution should be related to the sales volume: wine should be closely followed by beer, and spirits drinks should come in third place.

If we index recorded per capita alcohol consumption, income (real GDP per capita), inflation rate and the price level index to the earliest date available for all these indicators (1996), we see how things have evolved/ changed in comparison to the reference year (see figure 37).

Figure 37: source (The IWSR – drinks market analysis, World Bank – https://data.worldbank.org/indicator/NY.GDP.PCAP.CD & https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG, Eurostat – https://ec.europa.eu/eurostat/cache/metadata/en/prc_hicp_esms.htm indexed by the author)



While recorded per capita consumption remained relatively stable over the entire period, real GDP per capita (inflation rate adjusted) increased significantly (with a drop between 2007 and 2009). Moreover, it becomes apparent that prices for alcoholic beverages continuously increased, like the inflation rate, but were always above the inflation rate. While real prices for alcoholic beverages have increased (constantly above the inflation rate) between 1996 and 2018, alcoholic beverages have become more affordable because the increase in nominal and real income topped the increase in real prices for alcoholic beverages in Sweden.

#5 Per capita alcohol consumption & Heavy Episodic Drinking in the last month

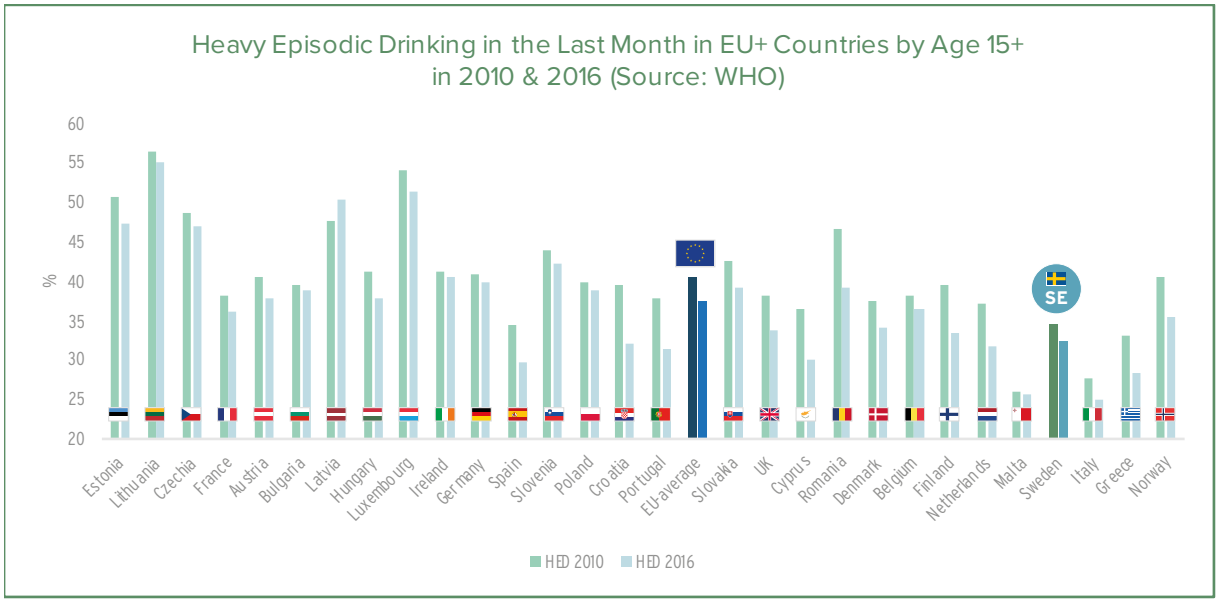
The following chapters try to assess alcohol-related harm trends, which should not only focus on (total and recorded) per capita alcohol consumption levels, but also and mainly on risky drinking patterns, including heavy episodic drinking (defined as more than 60g (about 6 standard drinks) in a single occasion). Heavy episodic drinking events may lead to acute alcohol-related harm, such as falls, while longer-term heavy drinking may lead to chronic alcohol-related diseases, such as liver disease. Unfortunately, we could not find data on heavy episodic drinking over longer periods of time, but only for some years.

MAIN FINDINGS

- The proportion reporting heavy episodic drinking in the last month is declining in all EU+ countries (apart from Latvia), if we compare 2010 to 2016 data provided by WHO.
- This decline occurred also in countries where recorded and total per capita alcohol consumption either increased, remained stable or declined, which indicates that these two indicators are not related to each other.
- A look at recorded and total per capita alcohol consumption levels and the proportion reporting heavy episodic drinking in 2016 and 2010 reveals a weak association at best.
- Among the selected country comparisons, Norway stands out with the highest proportion of heavy episodic drinkers in both WHO and Eurostat datasets, despite the fact that recorded and total per capita alcohol consumption levels are lowest in Norway compared to all other EU+ countries.
- The proportion of heavy episodic drinkers is higher in Nordic countries (Norway, Finland, and Sweden) compared to the Mediterranean countries (Italy, Greece, and Malta). However, the gap between Nordic and Mediterranean countries as regards heavy episodic drinking is narrowing.

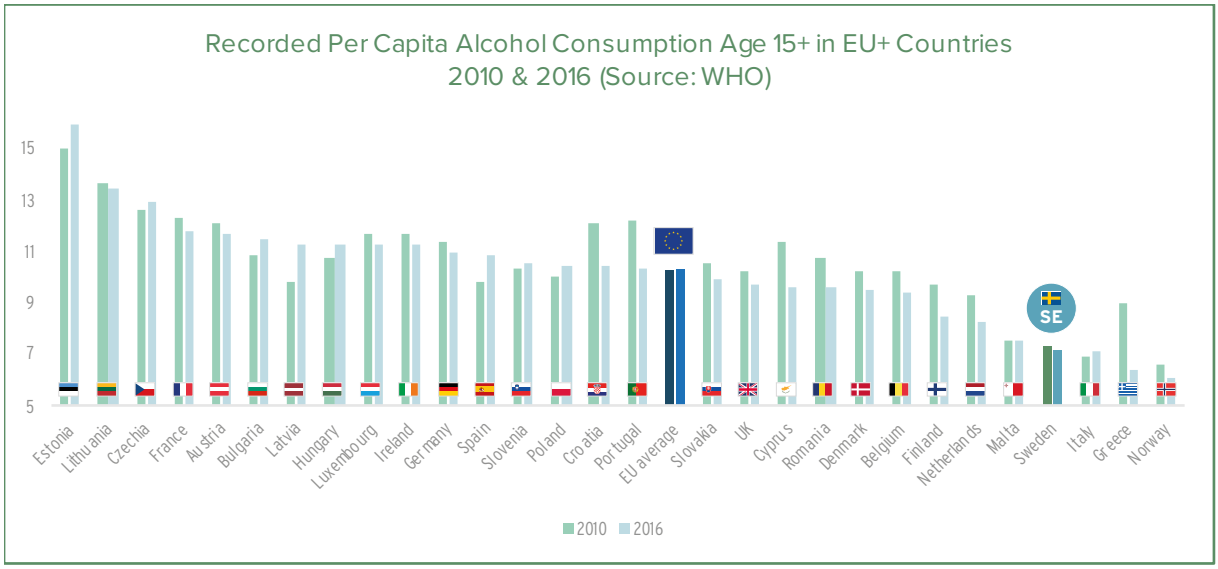
WHO provides data on the percentage of people who reported a heavy episodic drinking occasion in the last month for the year 2010 and the year 2016. In all EU+ countries (apart from Latvia), heavy episodic drinking (henceforth HED) declined between 2010 and 2016 (see figure 38, countries are sorted by the level of recorded per capita alcohol consumption in 2016).

Figure 38: source (WHO – https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



On EU-average, HED declined between 2010 and 2016 by 8%, while recorded per capita alcohol consumption remained stable at 10.3 litres of pure alcohol (Norway & UK are not counted to the EU average). In Latvia, HED increased, as did recorded and total per capita alcohol consumption. Moreover, HED also declined in countries where recorded per capita alcohol consumption increased, such as Estonia, Czechia, Belgium, Latvia, Hungary, Spain, Slovakia, and Poland (see figure 39). The y-axis starts at 5 litres to increase the visibility of the changes in figure 39.

Figure 39: source (WHO – https://www.who.int/data)



The declining trend in heavy episodic drinking between 2010 and 2016 in all EU+ countries (except for Latvia), appears to be independent of the level of recorded per capita alcohol consumption. Perhaps, HED is more closely associated to total (recorded and unrecorded) per capita alcohol consumption?

Figure 40: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption)

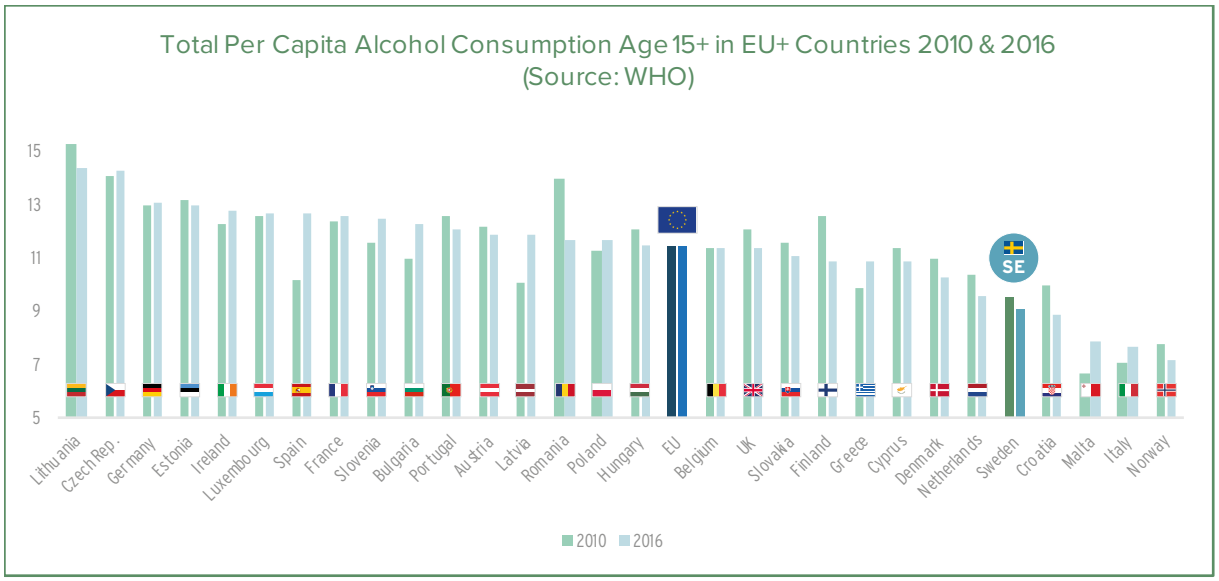
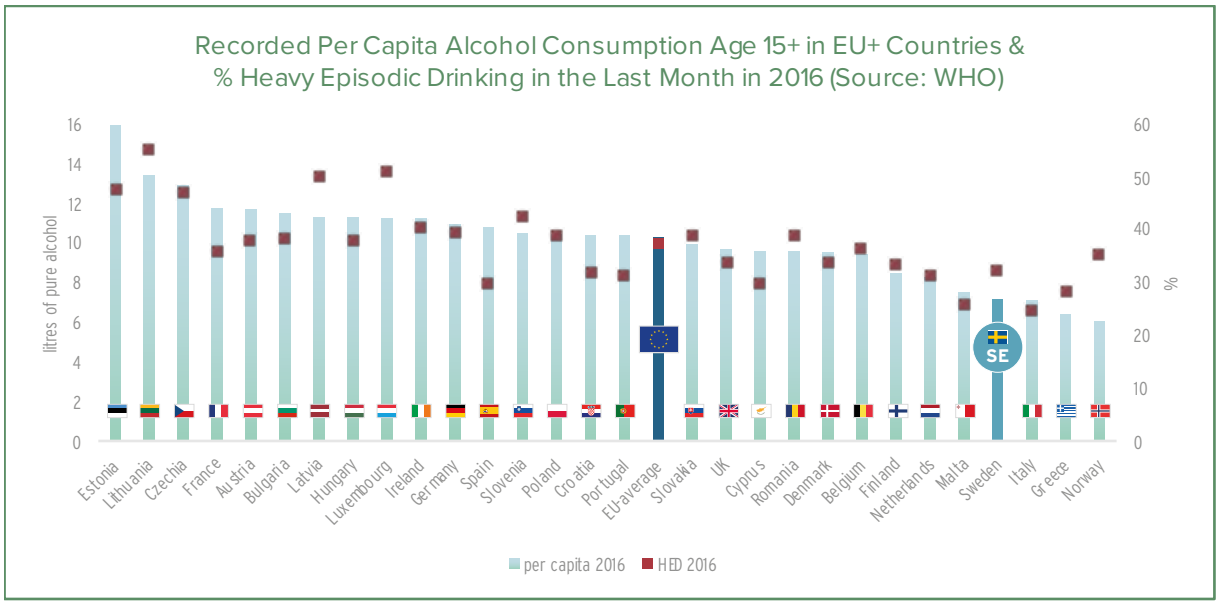


Figure 40 is sorted by total per capita alcohol consumption in 2016 (top-down) and the y-axis also starts at 5 litres to increase the visibility of changes. No significant differences can be observed when comparing total to recorded per capita alcohol consumption and HED. HED declined also in countries where total per capita alcohol consumption increased, such as in the Czech Republic, Germany, Ireland, Luxembourg, Spain, France, Slovenia, Bulgaria, Poland, Greece, Malta, and Italy. Compared to recorded per capita alcohol consumption, where an increase was reported for 9 countries, total per capita alcohol consumption apparently increased in 12 countries. Again, a declining trend in HED can be observed in all countries except Latvia, irrespective of the trend in total per capita alcohol consumption (increase, decreasing or stable).

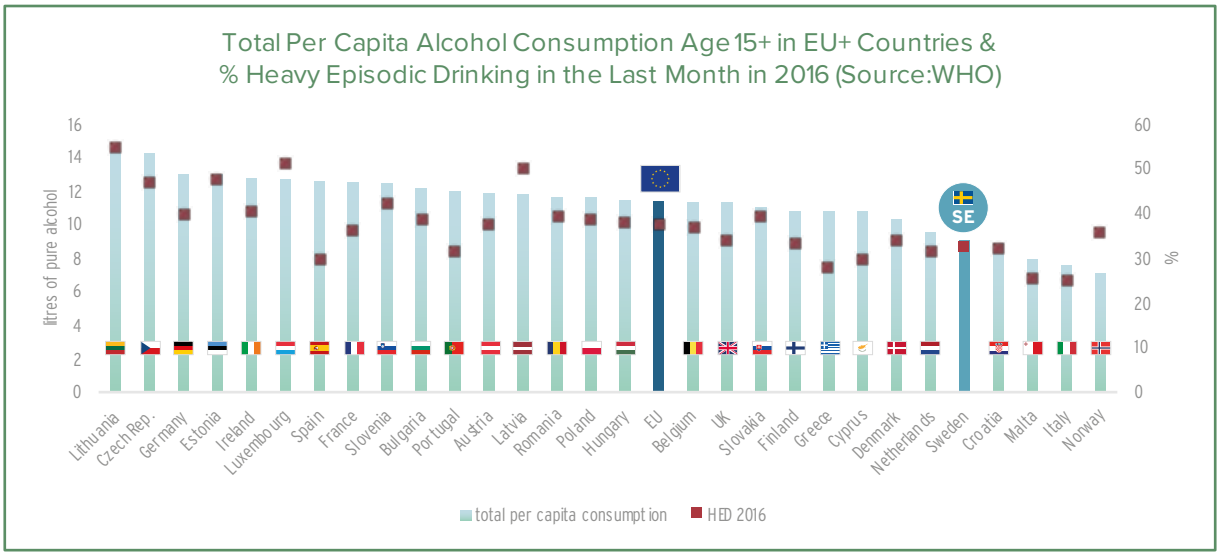
A snapshot view of the year 2016 reveals a very slight tendency that heavy episodic drinking in the last month is more common in countries with higher levels of recorded per capita alcohol consumption (see figure 41).

Figure 41: source (WHO – https://www.who.int/data & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



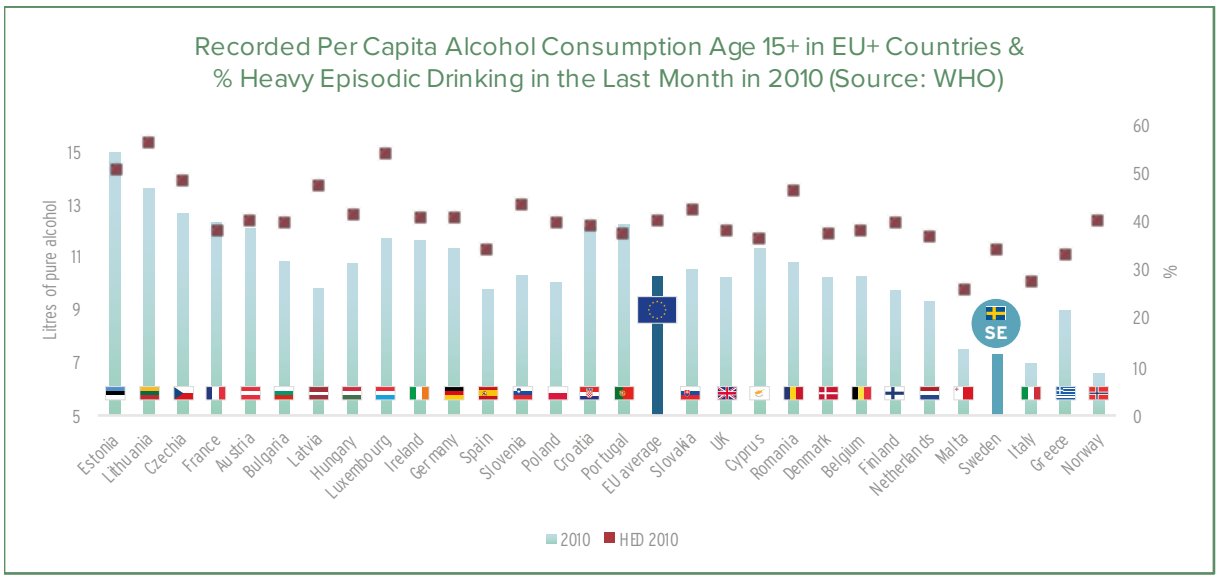
Also, the snapshot comparison between total per capita alcohol consumption and reported heavy episodic drinking within the last 30 days in 2016 reveals a similar picture as the one looking at recorded per capita alcohol consumption. There seems to be a tendency that HED is more common in countries with higher levels of total per capita alcohol consumption.

Figure 42: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



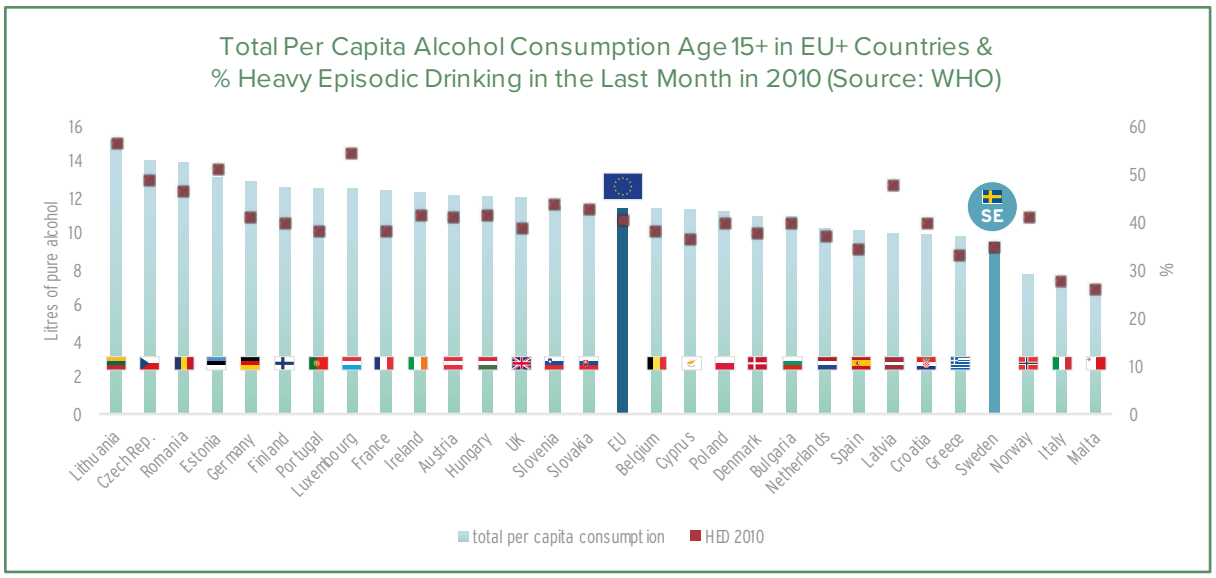
A similar picture emerges at the snapshot view for the year 2010, when comparing HED to recorded per capita alcohol consumption (figure 43).

Figure 43: source (WHO – https://www.who.int/data & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



The situation does not differ significantly, when looking at HED and total per capita alcohol consumption in 2010.

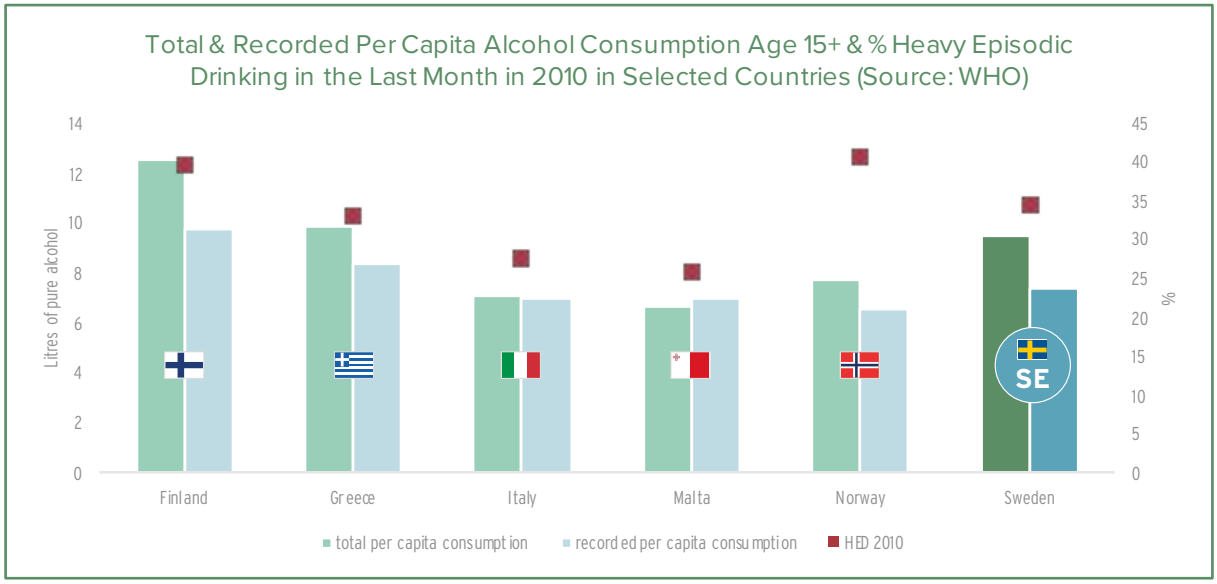
Figure 44: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



However, taking heavy episodic drinking and recorded and total per capita alcohol consumption trends, plus the rather weak relationship between heavy episodic drinking and levels of recorded and total per capita alcohol consumption together, those two indicators appear to be relatively independent of each other.

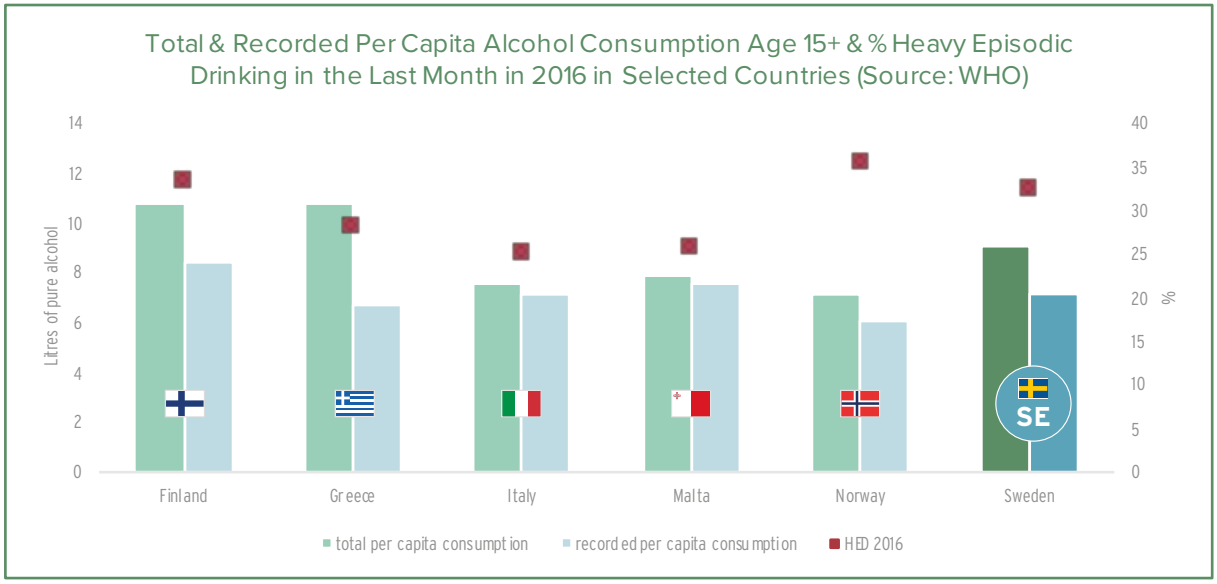
If we look at our selection of countries, heavy episodic drinking is most common in Norway, followed by Finland and Sweden in 2010. While Norway has the highest proportion of HED, the total per capita alcohol consumption level (7.7 litres) is significantly below the levels of Finland (12.6 litres) and Sweden (9.5 litres). Based on recorded per capita alcohol consumption, Norway ranks at the bottom. Notice that WHO data appears to be questionable for Malta, as recorded per capita alcohol consumption exceeds total consumption in 2010 (see figure 45). Countries are sorted alphabetically in figure 45 and 46.

Figure 45: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



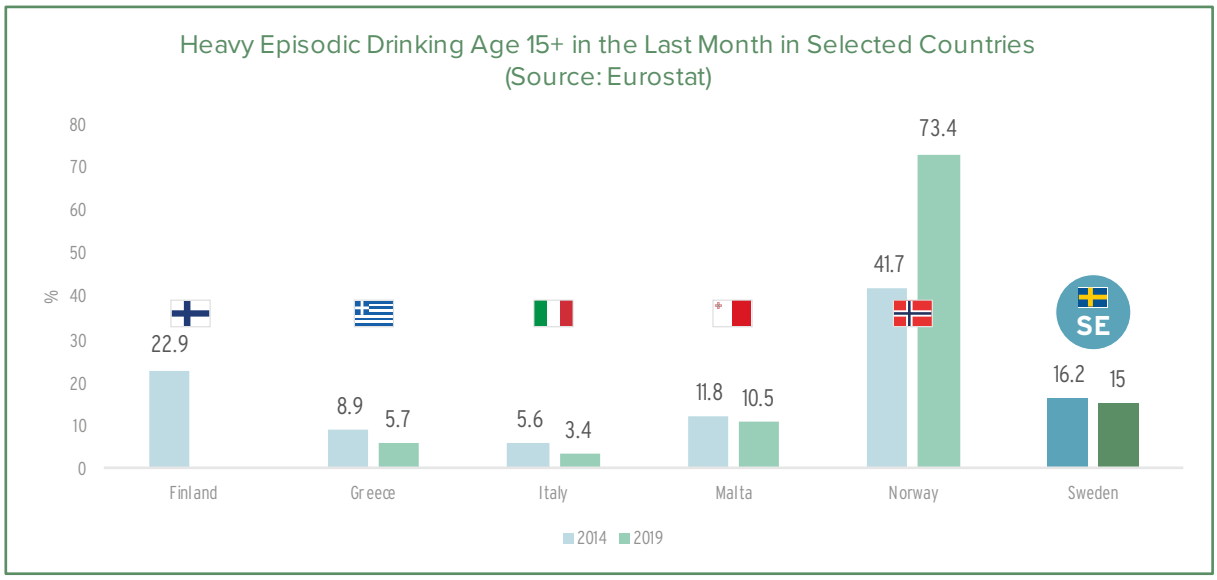
The country ranking as regards HED remains unchanged in 2016: Norway, Finland, and Sweden are the top three. However, the gap to Mediterranean countries is getting narrower. In 2016, Norway had the lowest level in both total (7.1 litres) and recorded (6 litres) per capita alcohol consumption among the selected countries. Finland and Greece have the same level for total per capita alcohol consumption (10.8 litres), but Greece still ranks fourth with regards to HED among the selected countries, below Norway, Finland, and Sweden.

Figure 46: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



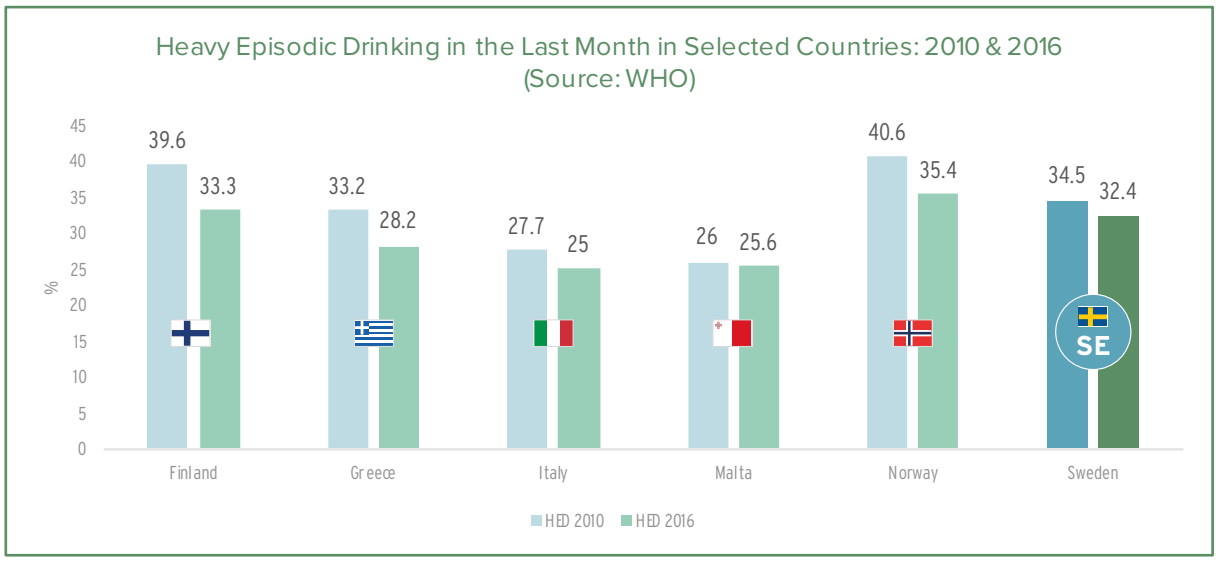
Also, Eurostat provides data on heavy episodic drinking in the last month for 2014 and 2019. According to this data, the proportion of heavy episodic drinkers is especially high in Norway compared to the other selected countries, although Norway has the lowest level in recorded and total per capita alcohol consumption in both years, according to WHO data. Again, Norway is followed by the Nordic neighbouring countries Finland and Sweden (see figure 47). Moreover, while total per capita alcohol consumption slightly decreased in Norway and Sweden between 2014 and 2019, it increased in Greece, Italy, and Malta. These trends in total per capita alcohol consumption coincided with a massive increase in reported HED in Norway (+76%) and the smallest decline in HED in Sweden (-7%). The decline in HED was stronger in Greece (-36%), Italy (-39%) and Malta (-11%). Eurostat data on HED indicates that total per capita alcohol consumption levels and changes, appear to be unrelated to reported HED occasions in the last month. Notice that for 2019, no data was provided for Finland and that Eurostat mentions a change in the method for Norway, which could perhaps explain this unexpectedly sharp increase in reported HED.

Figure 47: source (Eurostat – https://ec.europa.eu/eurostat/web/health/data/database?node_code=hlth_det)



If we compare heavy episodic drinking proportions in the selected countries from 2010 to 2016, a decline can be observed in all countries, though the sharpest decline occurred in Finland (-16%).

Figure 48: source (WHO – https://www.who.int/data & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



The declining trends in heavy episodic drinking proportions in the last month for selected countries between 2010 and 2016 is as follows: Finland (-16%) is followed by Greece (-15%), Norway (-13%), Italy (-10%), Sweden (-6%) and Malta (-2%).

Figure 49: source (WHO – https://www.who.int/data & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption, percentage change calculated by the author)

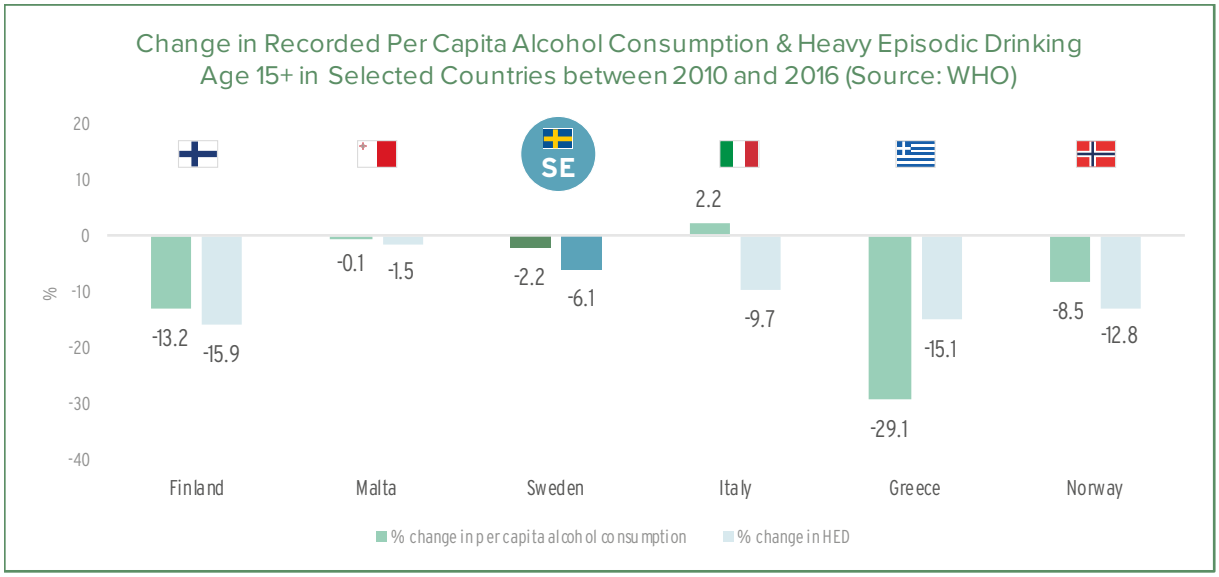
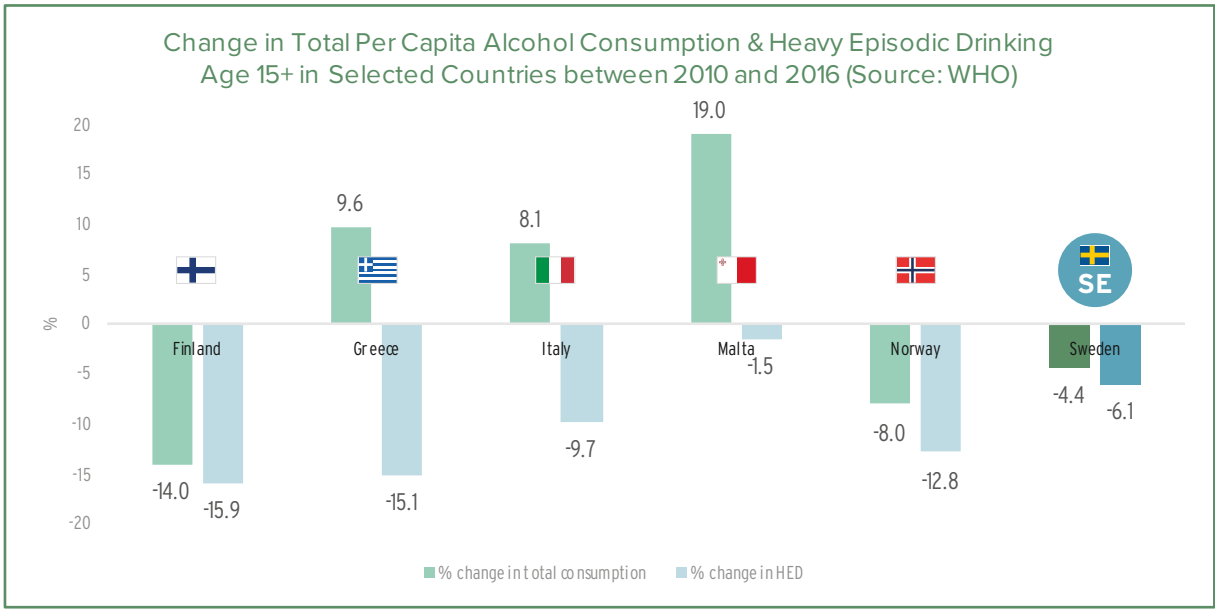


Figure 49 compares the change in HED to the change in recorded per capita alcohol consumption for the selected countries between 2010 and 2016. It is interesting to see that in Italy the proportion of heavy episodic drinking declined by 10%, despite an increase in recorded per capita alcohol consumption of 2%. How does HED change compare to total per capita alcohol consumption changes in respective countries?

Figure 50: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/patterns-of-consumption)



A look at HED and total per capita alcohol consumption changes between 2010 and 2016 shows a sharp decline in HED for Finland that coincided with a decline in total per capita alcohol consumption on the one hand. On the other hand, Greece experienced a similar decline in HED drinking, which coincided with a 10% increase in total per capita alcohol consumption. Figure 50 strongly indicates that total per capita alcohol consumption levels (and changes) appear not to be associated, or at very best, weakly associated with heavy episodic drinking.

#6 Per capita alcohol consumption & Life Expectancy at birth

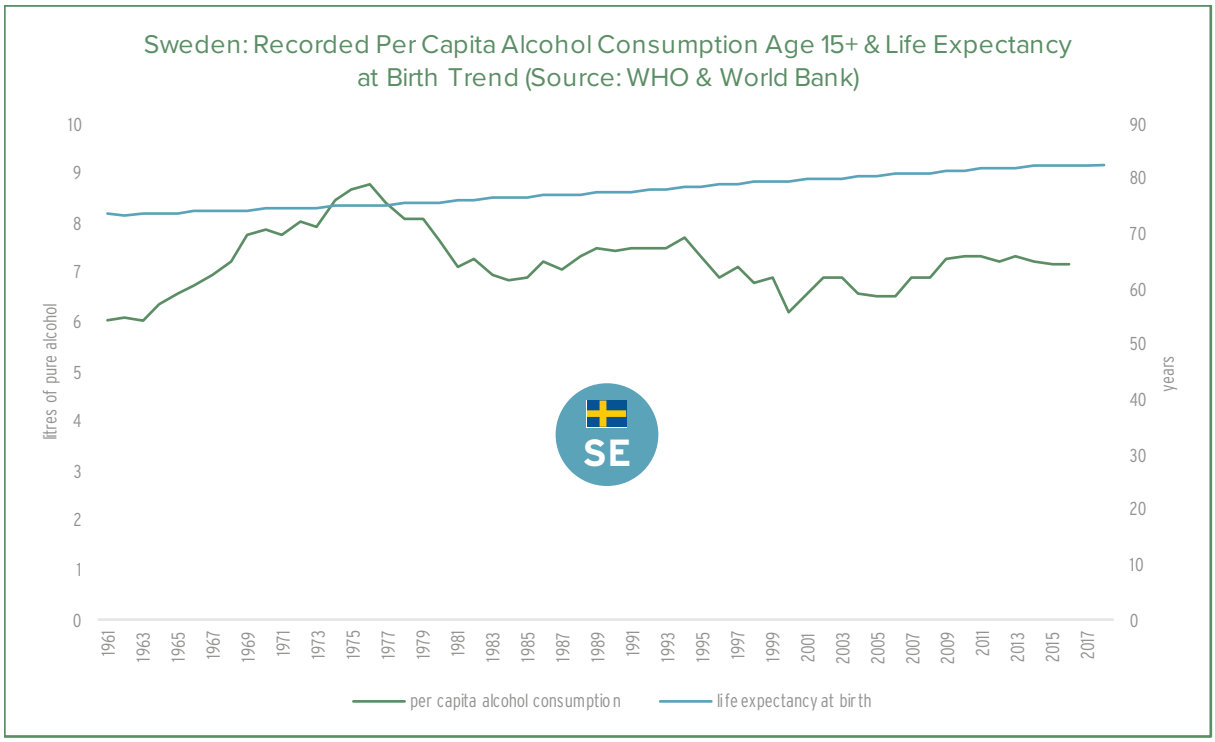
The inverse of mortality or mortality risk is life expectancy. In this section, we intend to assess if higher recorded and total per capita alcohol consumption levels coincide with a shorter life expectancy at birth, since the level of recorded and total per capita alcohol consumption is assumed to be a main driver for alcohol-related harm and mortality. Hence, according to the population-based theory, life expectancy at birth should be higher, the lower the level of total per capita alcohol consumption. Otherwise, total per capita alcohol consumption has little, or no explanatory power and other factors appear to be more important, such as an improved health care system, better medicines, etc.

MAIN FINDINGS

- Life expectancy at birth increased since 1961 in Sweden, irrespective of the trend in recorded per capita alcohol consumption: between 1961 and 2016, recorded per capita alcohol consumption in Sweden sometimes increased, decreased, and remained stable. Taking also total (recorded and unrecorded) per capita alcohol consumption for Sweden into account, does not yield a different finding.
- Recorded per capita alcohol consumption levels are also not correlated to life expectancy at birth trends in Finland, Norway, or Greece between 1961 and 2016.
- Italy experienced a large decline in recorded per capita alcohol consumption over the last decades and an increase in life expectancy at birth, which may lead to the conclusion that a reduction in recorded per capita alcohol consumption does indeed increase life expectancy. However, a look at Malta reveals the opposite, where one might conclude that an increase in recorded per capita alcohol consumption leads to an increase in life expectancy.
- Recorded per capita alcohol consumption trends have no explanatory power as regards the increasing trend in life expectancy at birth in all countries analysed in this chapter. Put differently, the level of recorded per capita alcohol consumption appears to be independent of all-cause mortality. Empirical data does not support the population-based hypothesis.

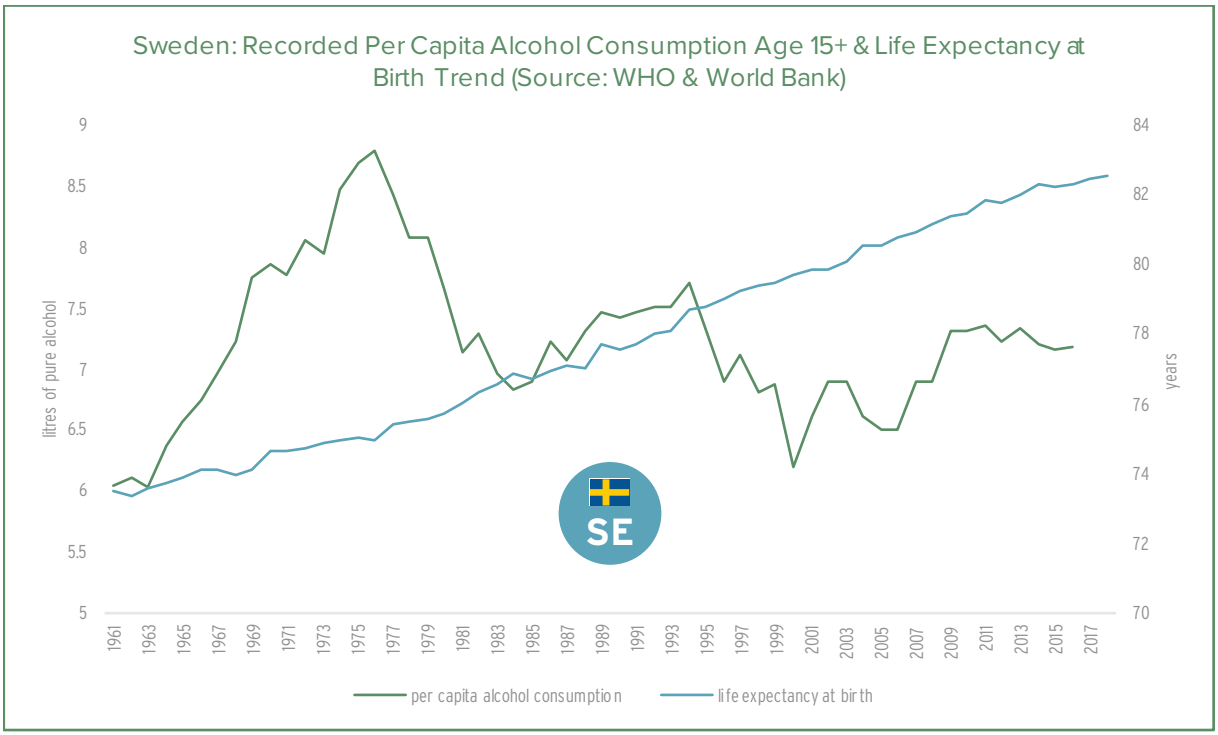
A continuous increase in life expectancy at birth since 1961 can be observed in Sweden, irrespective of the trend in recorded per capita alcohol consumption between 1961 and 2016 (see figure 51).

Figure 51: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



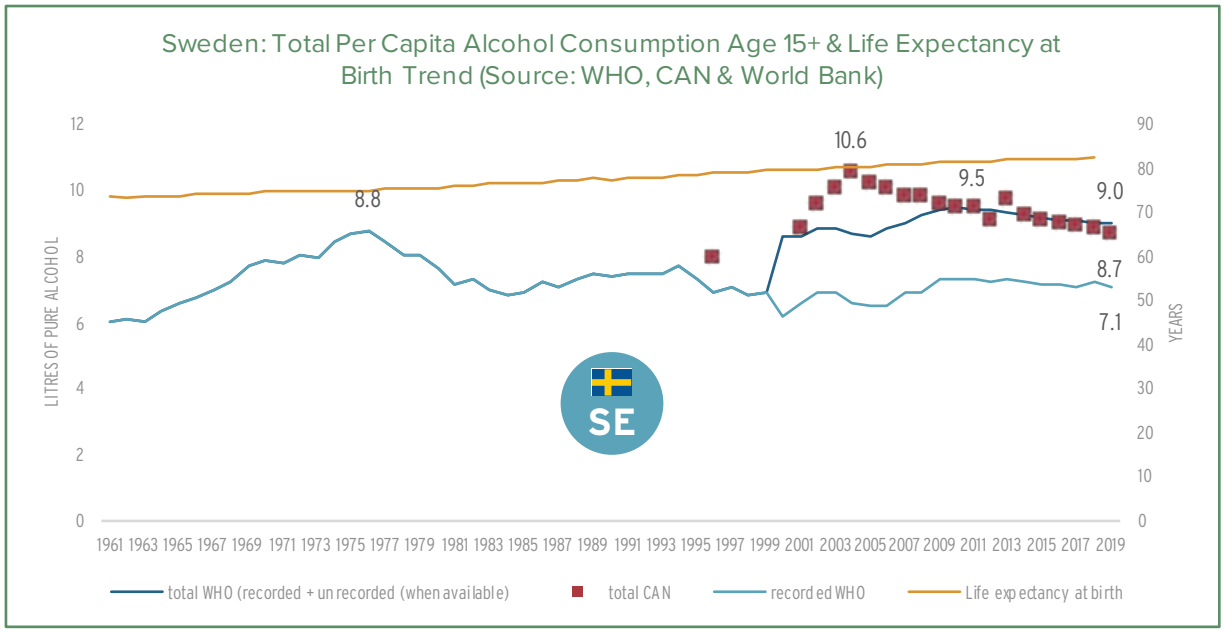
That the trend in life expectancy is rather independent of the trend in recorded per capita alcohol consumption becomes even more apparent, when scaling into the chart (see figure 52).

Figure 52: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



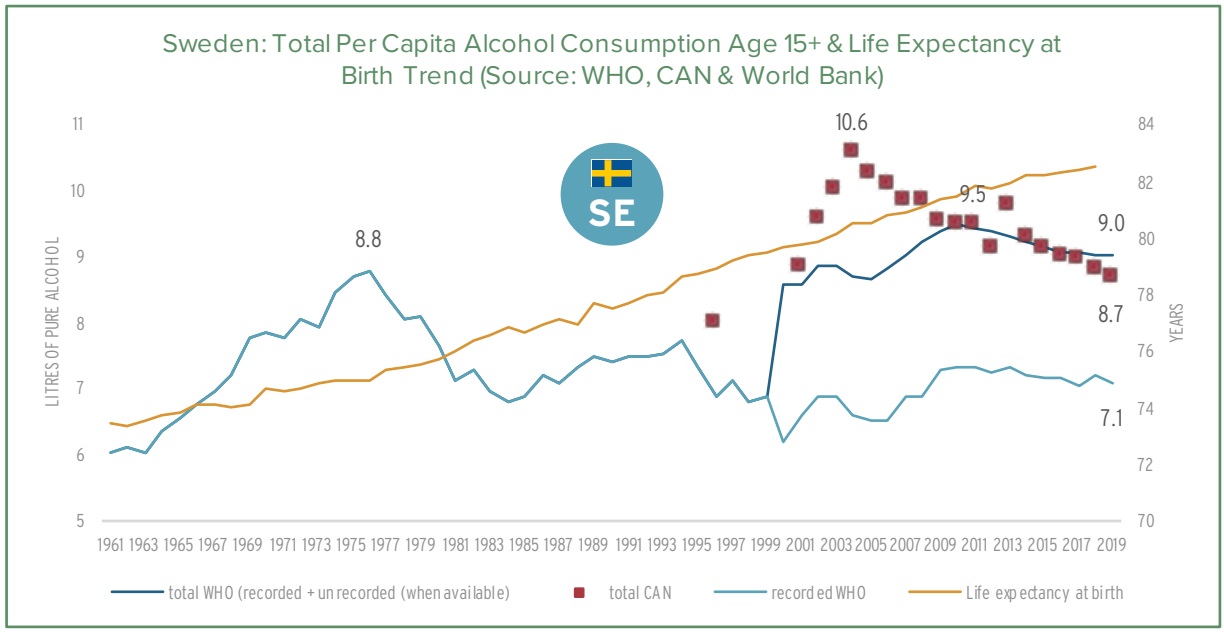
Life expectancy at birth moved from 73.5 years in 1961 to 82.4 years in 2018 in Sweden, which represents a 12% increase. During the same period, recorded per capita alcohol consumption was in a range from 6 to almost 9 litres of pure alcohol (see Figure 52). Does the situation change if we consider the trend in total per capita alcohol consumption after 1995?

Figure 53: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



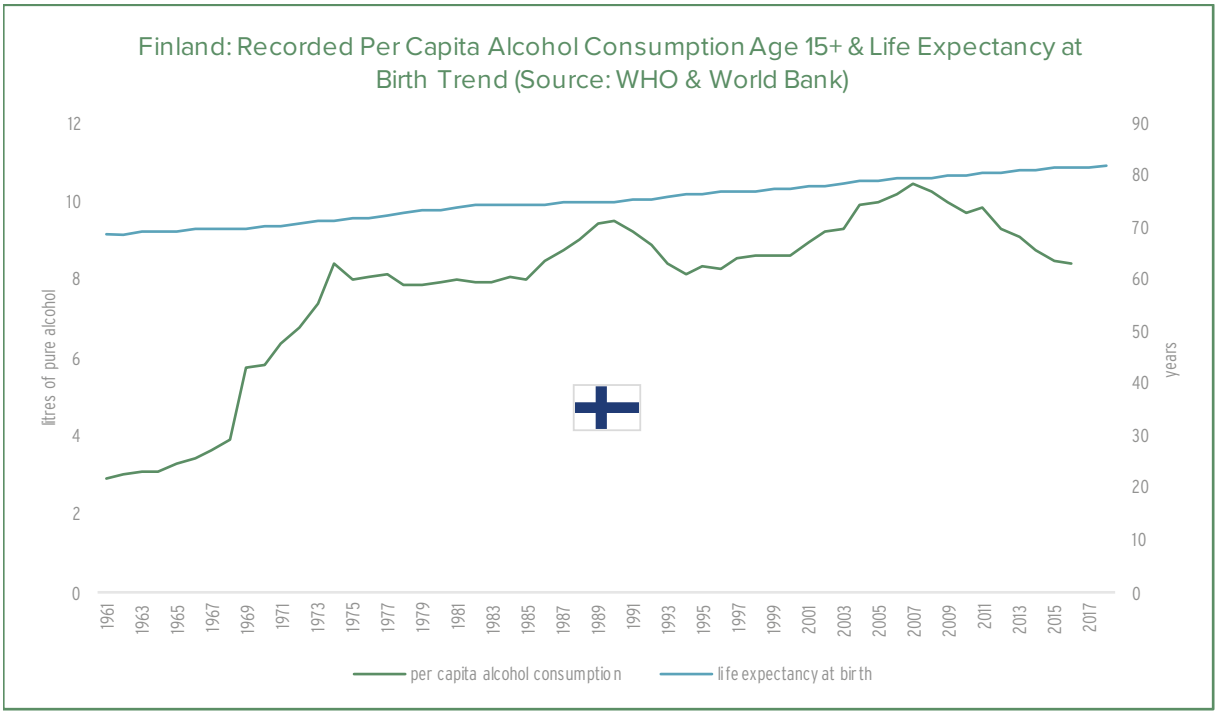
The increase in total per capita alcohol consumption in Sweden after 1995 until 2004 (according to CAN data) or 2010 (according to WHO data) had no impact on life expectancy. This becomes more visible when scaling into the chart (see figure 54).

Figure 54: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



Similar trends in life expectancy at birth can be observed in Sweden's neighbouring countries, Finland or Norway.

Figure 55: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



In Finland, life expectancy at birth moved from 68.8 years in 1961 to 81.8 years in 2018, which represents a 19% increase. During the same period, recorded per capita alcohol consumption was in a range from 3 to more than 10 litres of pure alcohol (see figure 56).

Figure 56: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)

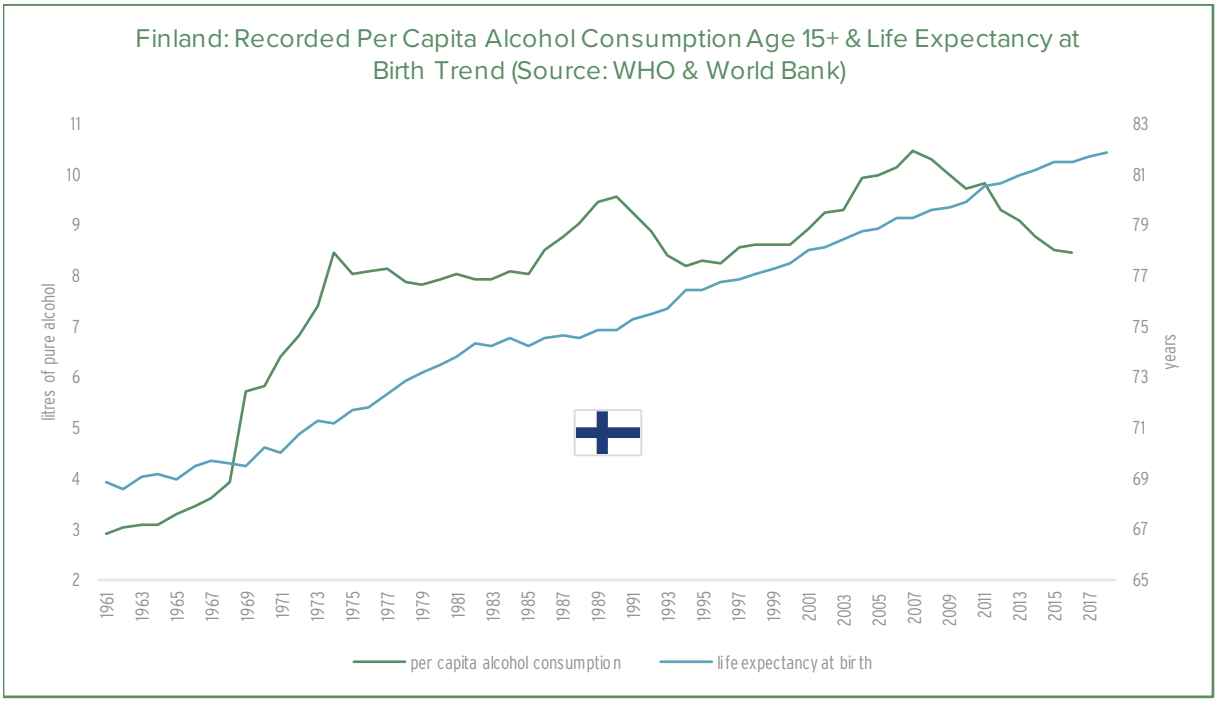
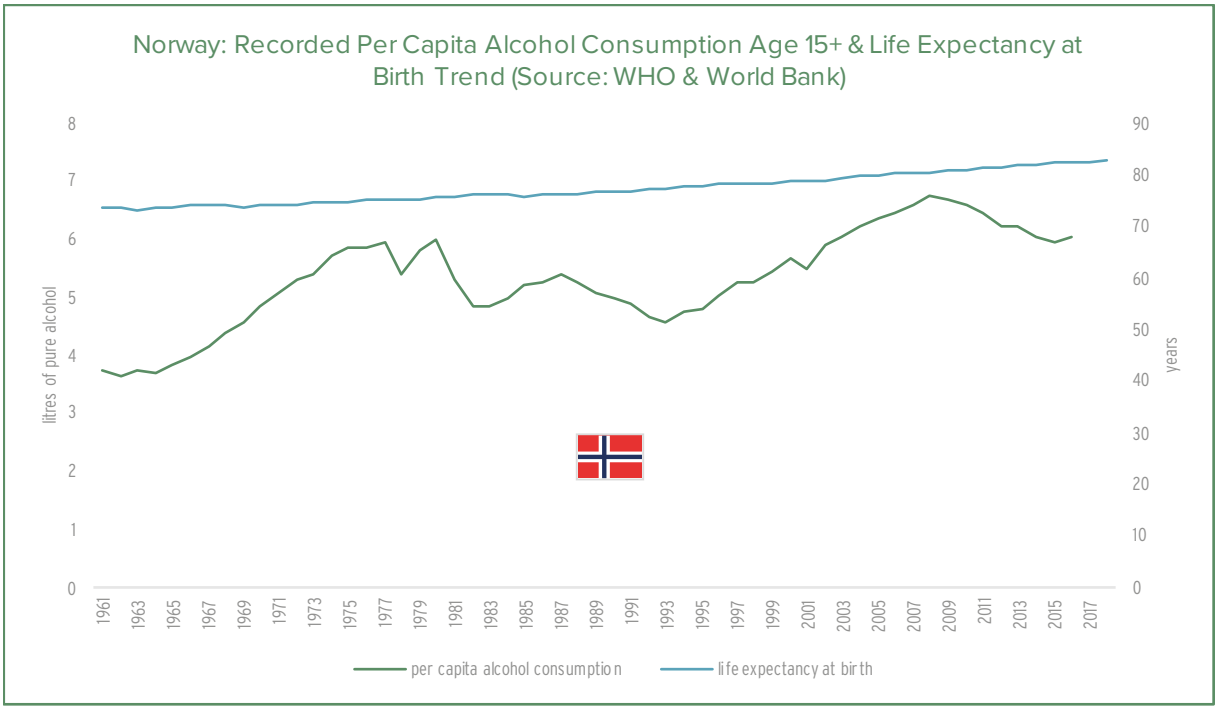
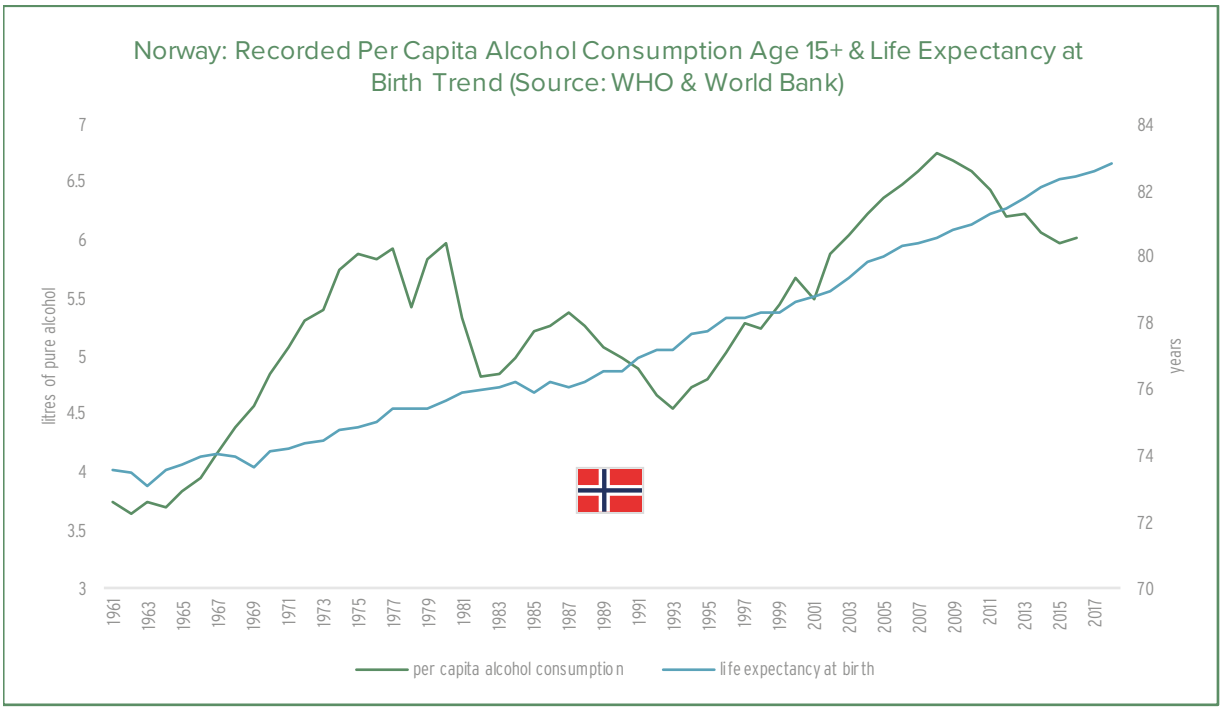


Figure 57: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



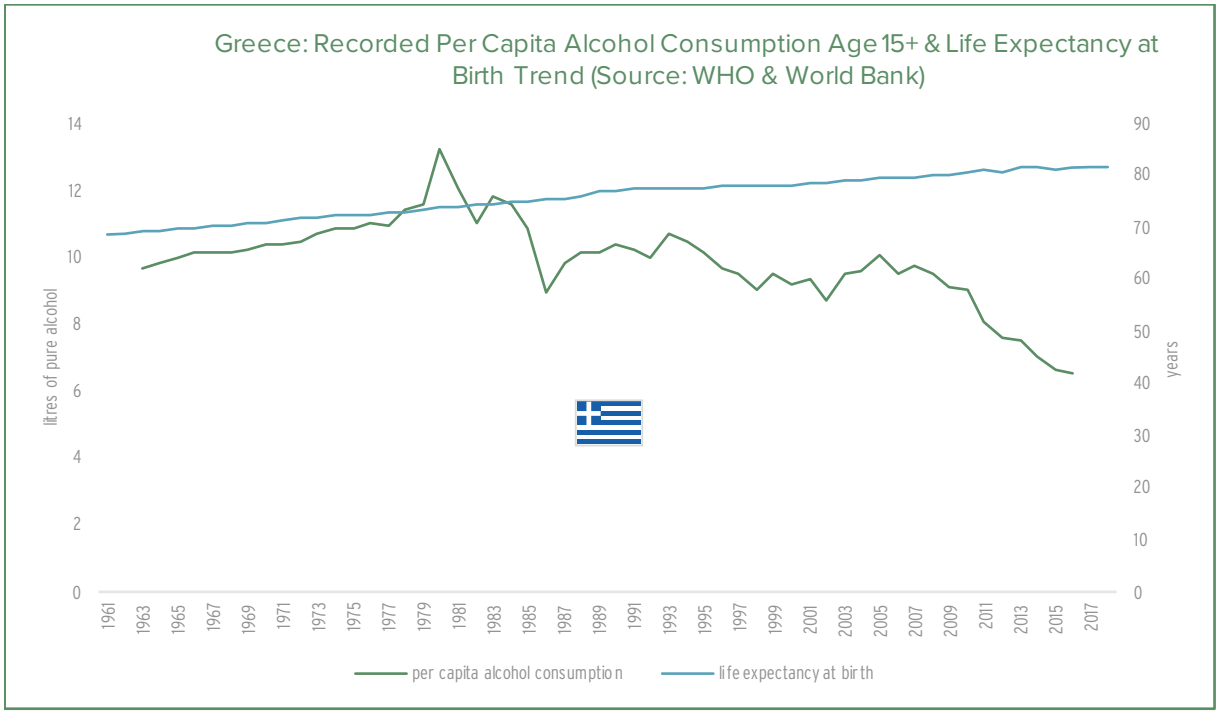
In Norway, life expectancy at birth moved from 73.4 years in 1961 to 82.8 years in 2018, which represents a 13% increase. At the same time, recorded per capita alcohol consumption was in a range from almost 4 to a little less than 7 litres of pure alcohol (see figure 58).

Figure 58: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



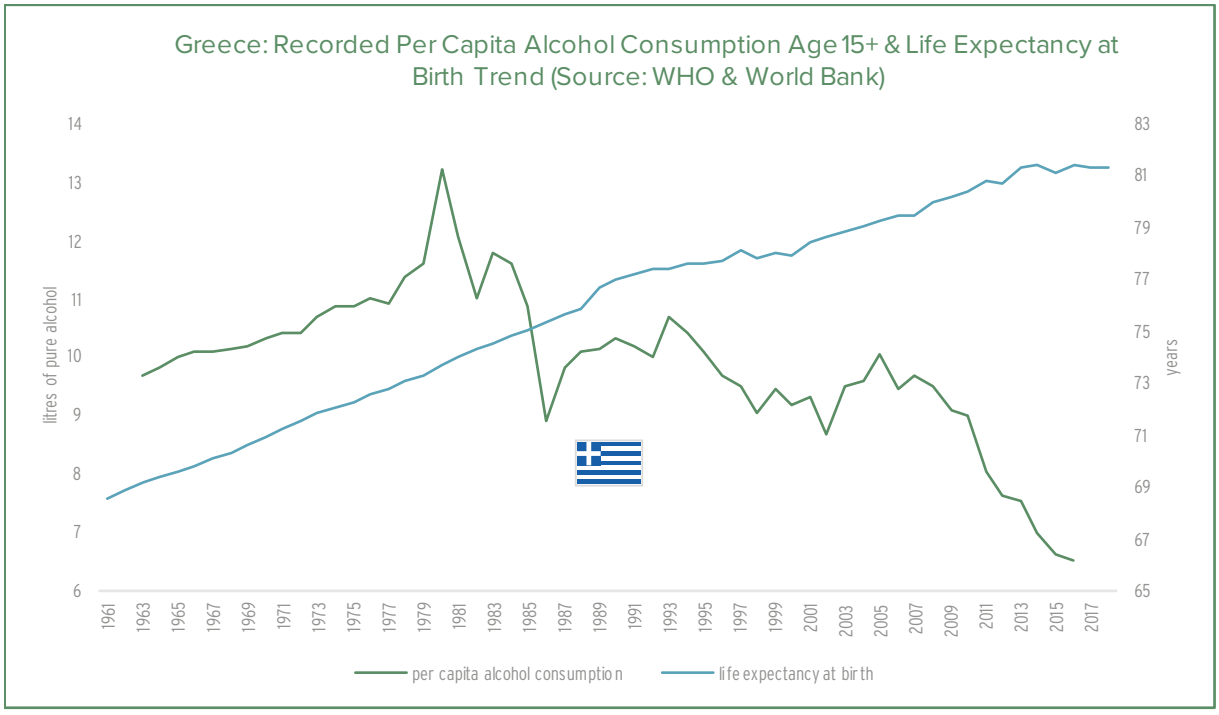
What trends can be observed for the Mediterranean countries, such as Greece, Italy and Malta, that show similar levels in recorded per capita alcohol consumption as Sweden in 2016?

Figure 59: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



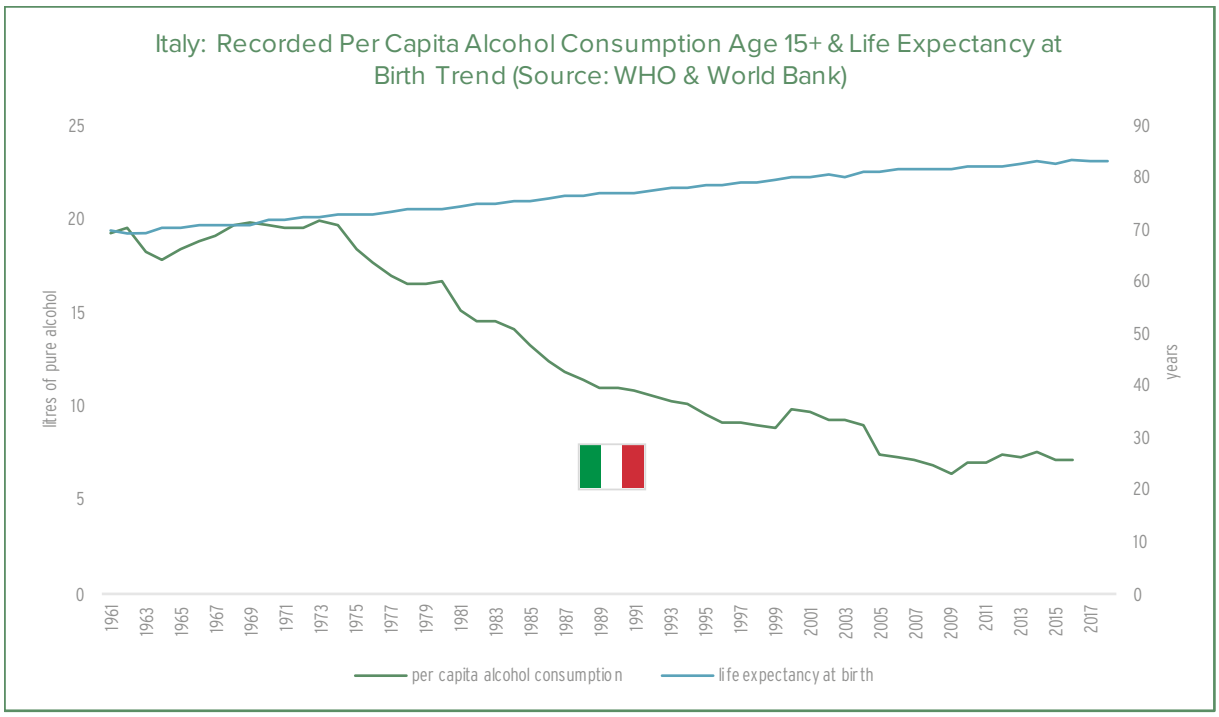
In Greece, life expectancy at birth moved from 68.5 years in 1961 to 81.3 years in 2018, which represents a 19% increase. At the same time, recorded per capita alcohol consumption was in a range from almost 6 to more than 13 litres of pure alcohol (see figure 60).

Figure 60: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



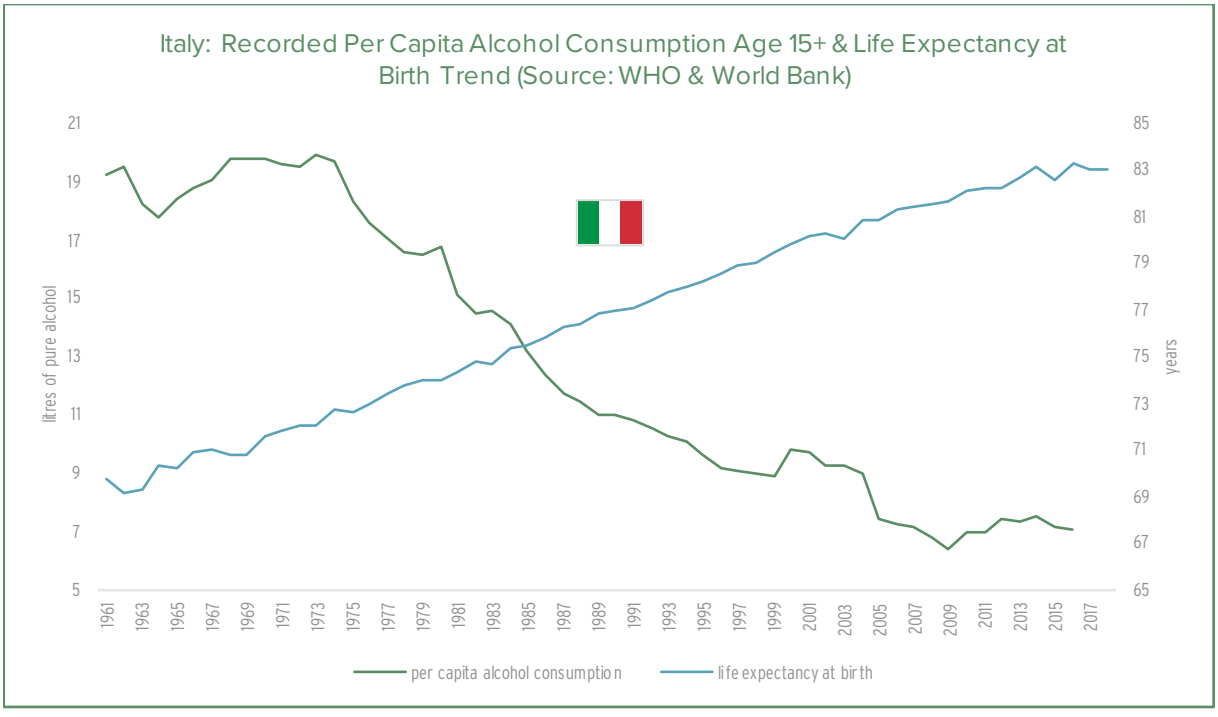
Looking at Greece (figure 60) could lead to the conclusion that the more alcohol people consume, the higher is their life expectancy at birth at least between 1961 and 1980. The reverse conclusion could be derived for the years between 1980 and 2016.

Figure 61: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



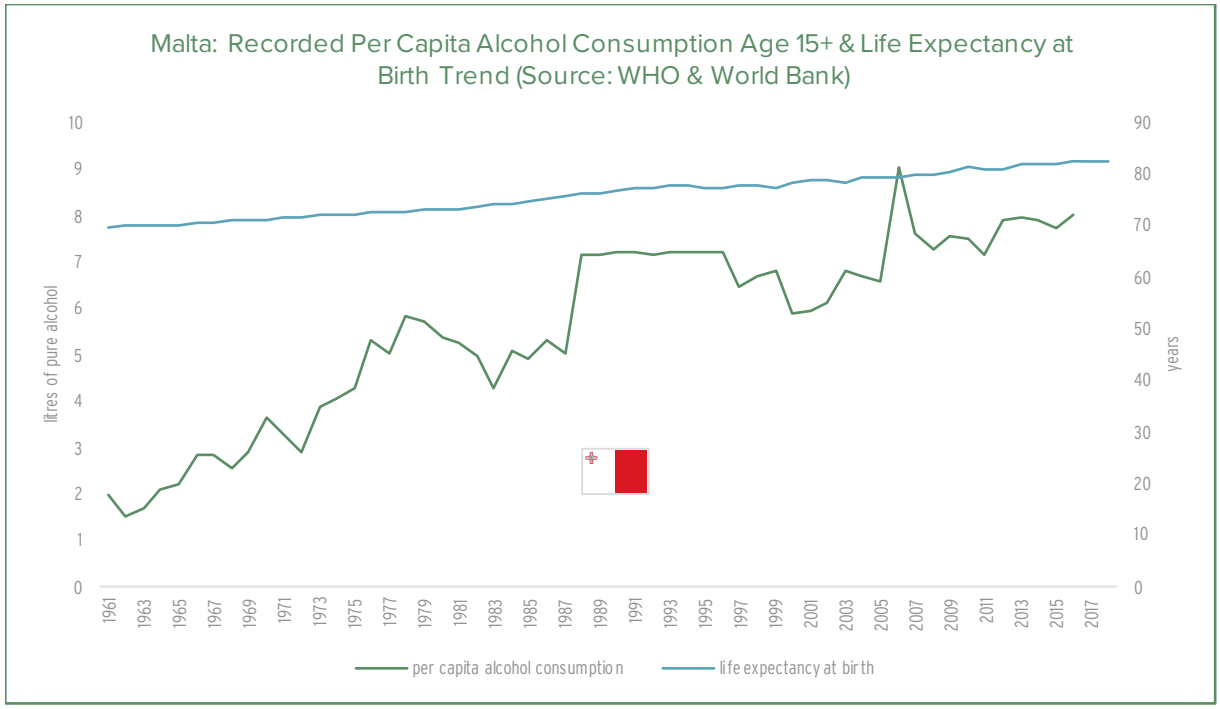
In Italy, life expectancy at birth moved from 69.8 years in 1961 to 82.9 years in 2018, which represents a 19% increase. At the same time, recorded per capita alcohol consumption was in a range from 20 to a bit less than 7 litres of pure alcohol (see figure 62).

Figure 62: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



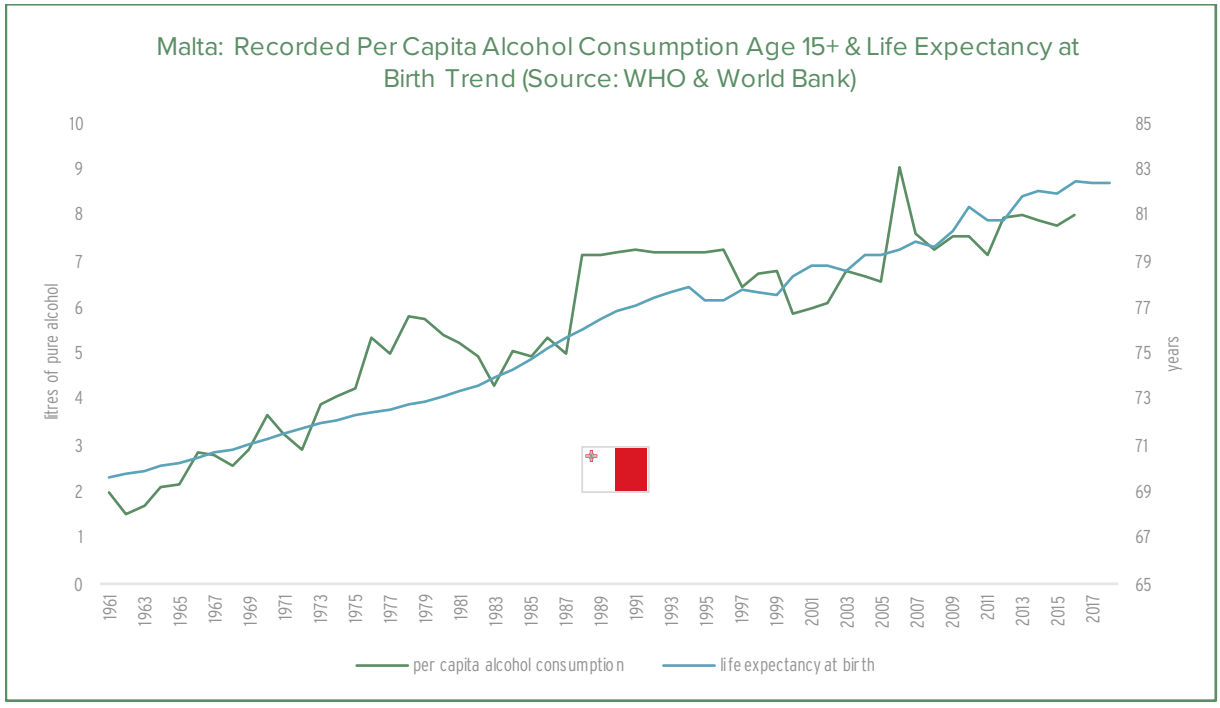
Looking at Italy (figure 62) could lead to the conclusion that the lower recorded per capita alcohol consumption, the higher life expectancy at birth at least for the years 1975 to 2009.

Figure 63: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



In Malta, life expectancy at birth moved from 69.6 years in 1961 to 82.3 years in 2018, which represents an 18% increase. At the same time, recorded per capita alcohol consumption was in a range from less than 2 to 9 litres of pure alcohol (see figure 64).

Figure 64: source (WHO – https://www.who.int/data & World Bank – https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC)



Looking at Malta (figure 64) could lead to the conclusion that the higher recorded per capita alcohol consumption, the higher life expectancy at birth, that is the opposite to Italy.

Table: Trend summary

Country	Sweden	Finland	Norway	Greece	Italy	Malta
Life expectancy at birth in 2018 (years)	82.5	81.8	82.8	81.3	82.9	82.3
Growth since 1961	+12%	+19%	+13%	+19%	+19%	+18%
Recorded per capita consumption changes since 1961	+19%	+190%	+61%	-33%	-63%	+303%

Life expectancy at birth reached a similar level in all countries selected in this chapter: there is no significant difference between Nordic and Mediterranean countries. If one looks at Italy only, one could infer that a decline in recorded per capita alcohol consumption is associated with an increase in life expectancy. However, looking at Malta, one could infer that an increase recorded in per capita alcohol consumption is associated with an increase in life expectancy. The remaining countries show varying trends in recorded per capita alcohol consumption levels, whereas life expectancy is on an increase irrespectively in all countries. A look at the recorded per capita alcohol consumption & life expectancy at birth charts (and the table above) reveals that these two indicators appear to be unrelated to each other. The finding for Sweden does not differ when total per capita alcohol consumption (recorded and unrecorded) is included after 1995. In other words, empirical data does not support the population-based theory, according to which life expectancy at birth should increase when per capita alcohol consumption decreases.

#7 Per capita alcohol consumption & drink-driving deaths

Drink-driving deaths, especially if innocent victims are involved, are alcohol-related externalities (concerning not only the irresponsible drinker) that need to be limited or, at best, fully avoided. Since drink-driving deaths data is collected in different ways in each country, country comparisons cannot be undertaken. However, it is possible to look at trends in each specific country. This chapter draws on data derived by European Transport and Safety Council – henceforth ETSC (https://etsc.eu/category/publications/?tag=drink-driving). Following the population- based theory, alcohol-related harm, including drink-driving, should be related to per capita alcohol consumption trends and levels. Perhaps, the rate of heavy episodic drinking might be an indicator that could also explain drink-driving deaths, but there is not sufficient data available to run such an assessment. Obviously, as for all alcohol-related harms, there are a number of factors, which have an impact on drink-driving deaths, such as BAC levels & enforcement, randomised checks, education, changes in social norms, urbanisation, awareness campaigns, public transport opportunities, designated drivers, speed limits, or general road traffic. In this chapter, we are interested to see whether recorded (and for Sweden also total) per capita alcohol consumption levels/trends have any explanatory power.

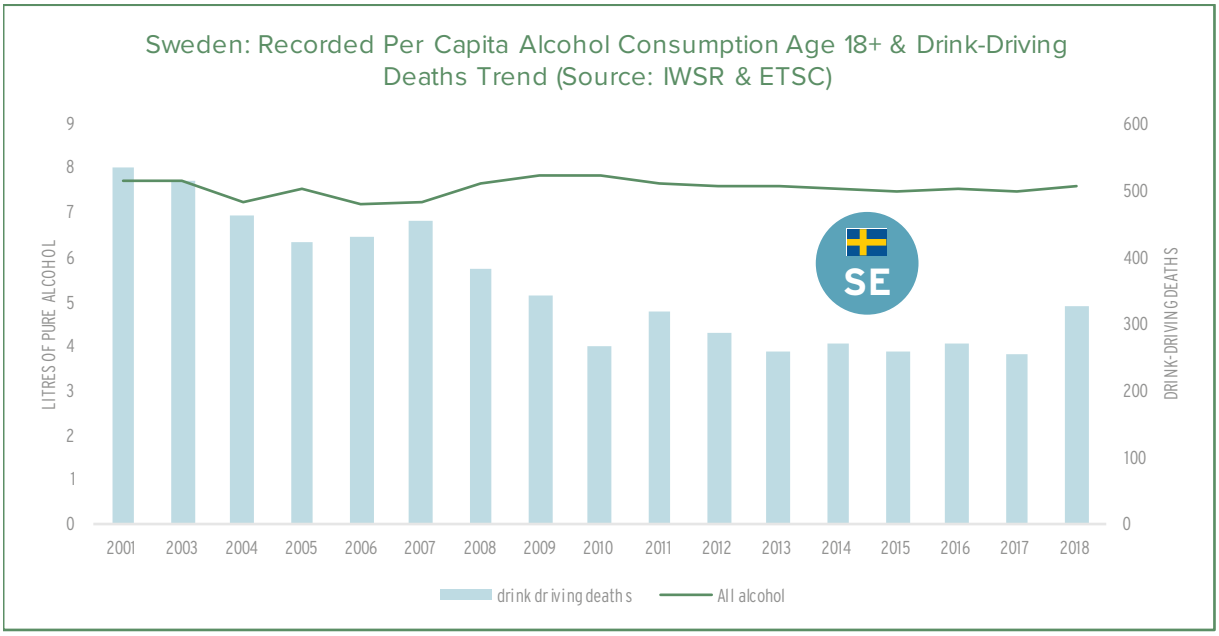
MAIN FINDINGS

- Overall, drink-driving deaths are declining in Sweden, Finland, Norway (the Nordic countries) as well as in Greece and Italy (Mediterranean countries) between 2001 and 2018.
- The declining trend in drink-driving deaths coincided with rather stable trends in recorded per capita alcohol consumption, with some minor increases and decreases between 2001 and 2018 in Sweden. The consideration of total per capita alcohol consumption in Sweden does not change the finding: per capita alcohol consumption does not explain the declining trend in drink- driving deaths in Sweden as well as in Finland, Norway, Greece and Italy.
- This is also the case for Malta, where a slightly increasing trend in recorded per capita alcohol consumption coincided with ups and downs in drink-driving deaths.

ETSC provides drink-driving deaths data from 2001 to 2018 in their reports, which we compare to recorded per capita alcohol consumption for people above the legal purchasing age derived from IWSR, since the latter offers the most recent data points up to 2018. For Sweden, we compare drink-driving deaths also to total per capita alcohol consumption.

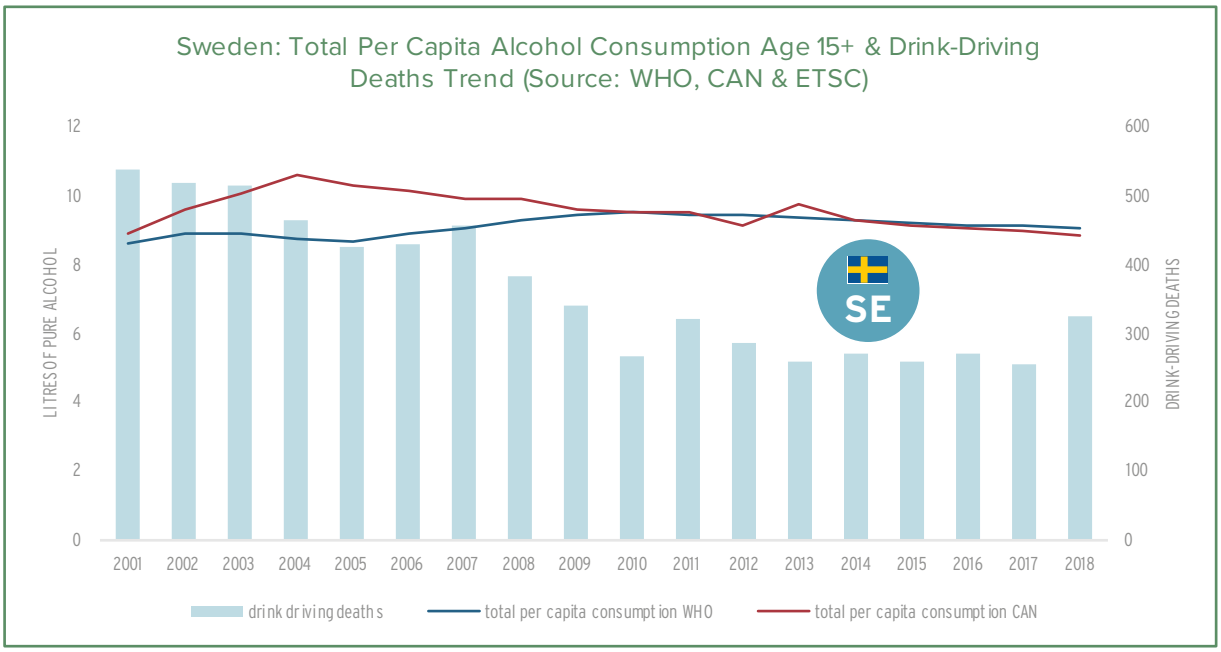
Drink-driving deaths have been declining in Sweden between 2001 and 2018, though an increase was observed last year where data was available. This overall declining trend coincides with slight increases and decreases in recorded per capita alcohol consumption, though the level of recorded per capita alcohol consumption remained rather stable during the timespan (see figure 65).

Figure 65: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)



Drink-driving deaths appear to be unrelated not only to recorded per capita alcohol consumption trends, but also to total per capita alcohol consumption in Sweden.

Figure 66: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)



A declining trend in drink-driving deaths can also be observed for Finland, Norway, Italy, and Greece (see figure 67 to 70).

Figure 67: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)

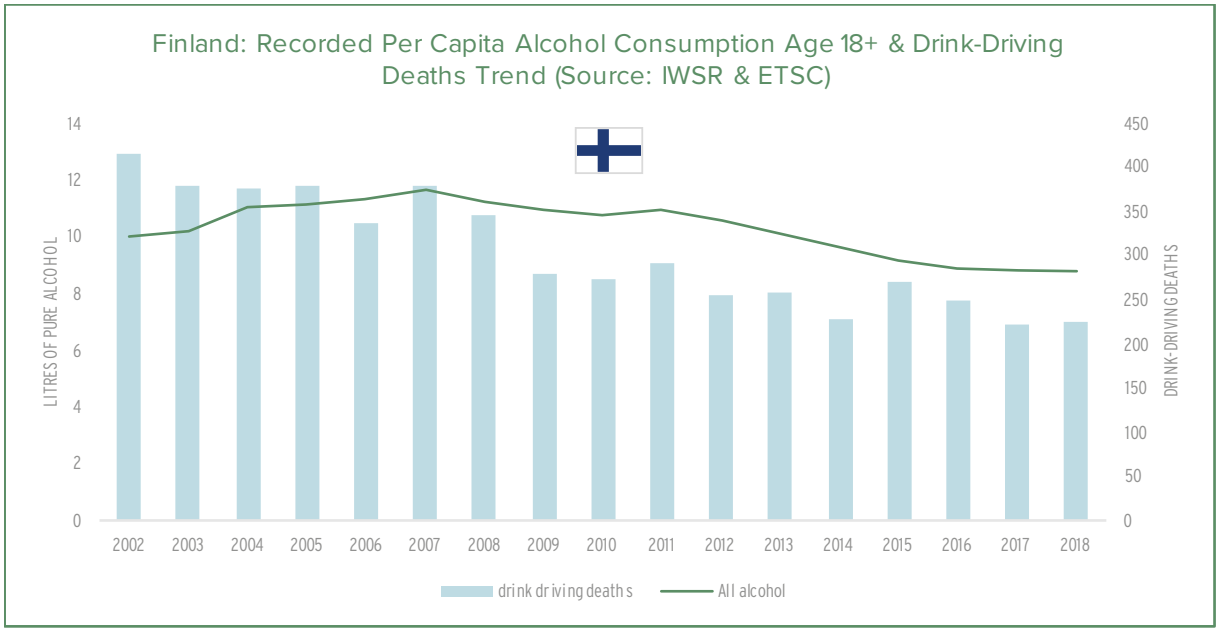


Figure 68: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)

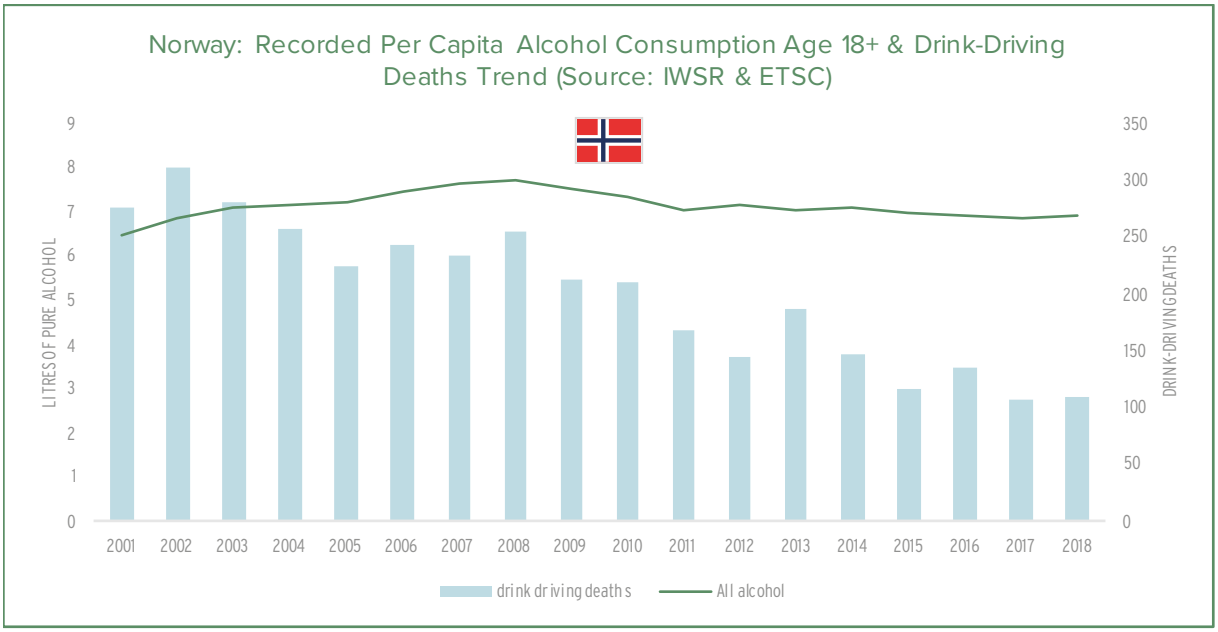


Figure 69: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)

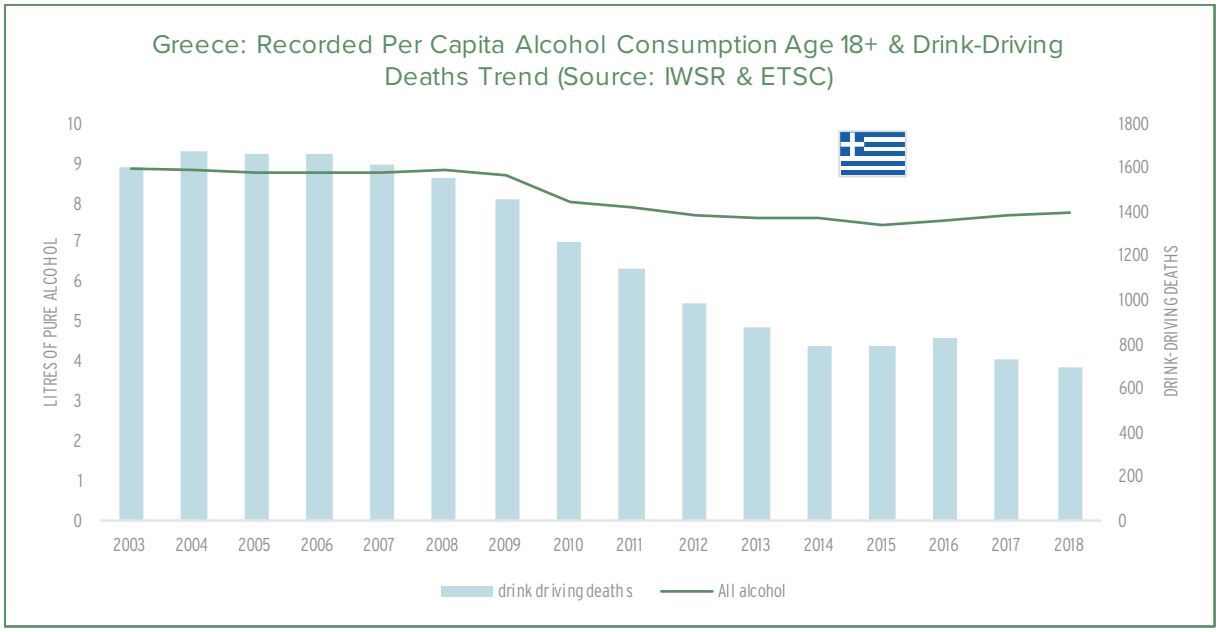
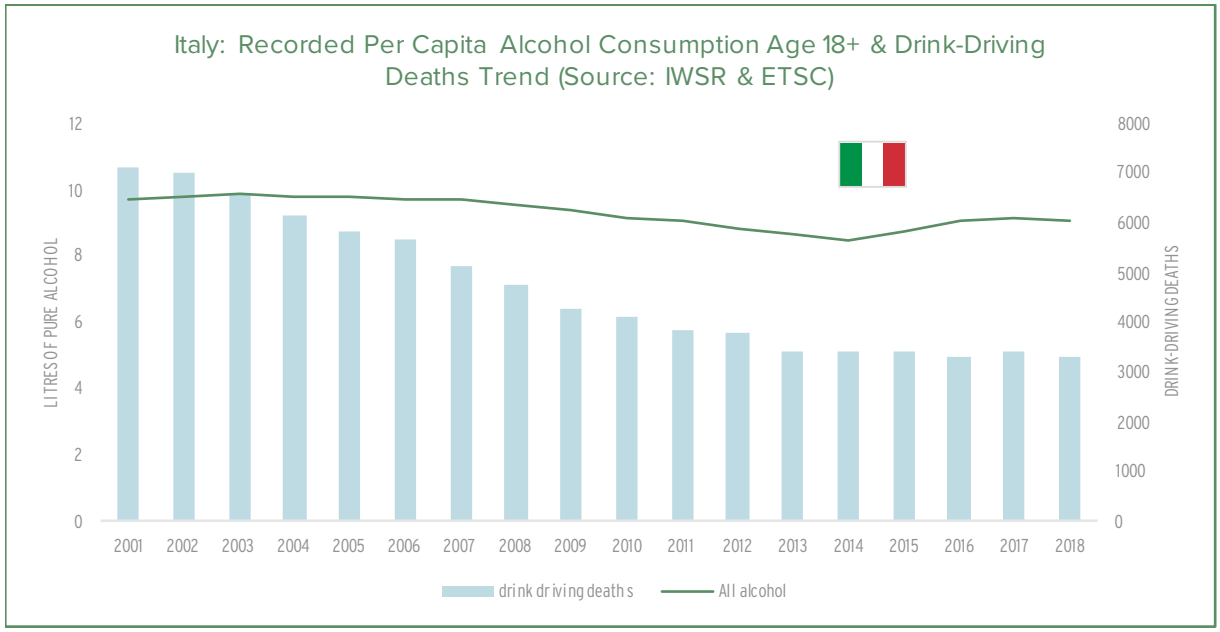


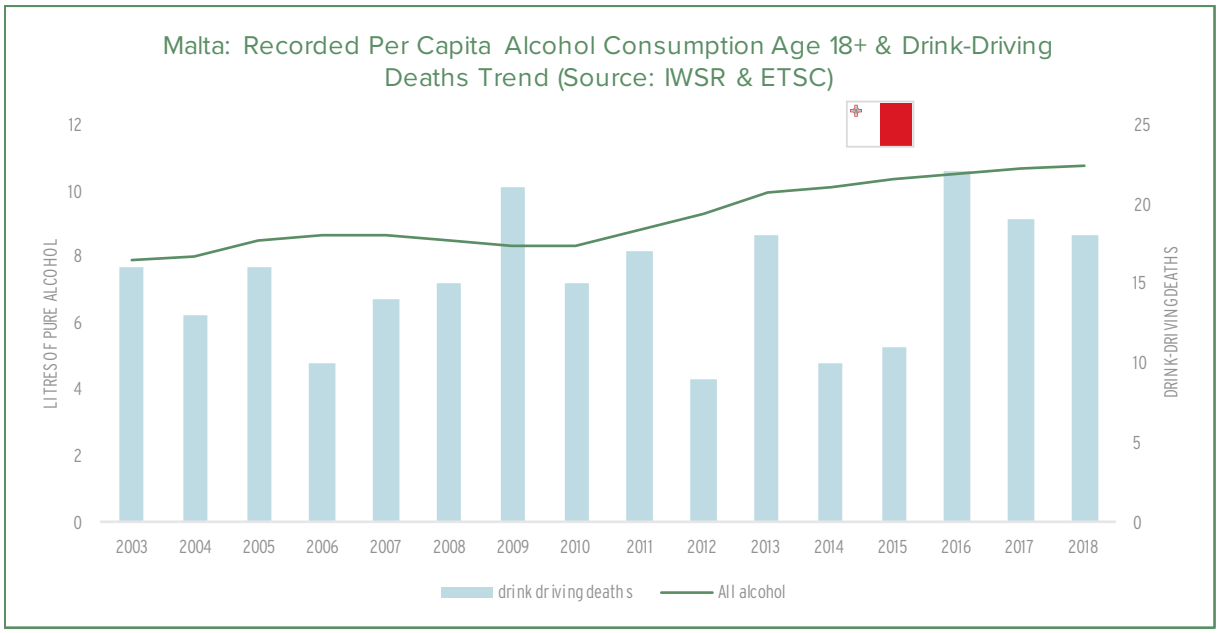
Figure 70: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)



In all those countries, the declining trend in drink-driving deaths does not coincide with a constantly declining trend in recorded (or for Sweden also total) per capita alcohol consumption, but with rather stable trends (sometimes slightly declining and sometimes slightly increasing) between 2001 and 2018.

Only in Malta, the trend in drink-driving deaths is showing ups and downs. However, a clear correlation to recorded per capita alcohol consumption seems to be difficult to infer.

Figure 71: source (The IWSR – drinks market analysis & ETSC – https://etsc.eu/category/publications/?tag=drink-driving)



In short, per capita alcohol consumption levels and trends do not explain the overall declining trend in drink-driving deaths for Sweden, Finland, Norway, Greece, or Italy. The ups and downs in drink-driving deaths in Malta are also not explained by the slightly increasing trend in recorded per capita alcohol consumption. Empirical evidence does not support the population-based hypothesis, according to which the level of per capita alcohol consumption should explain the number of drink-driving deaths in a country.

#8 Per capita alcohol consumption & underage drinking trends in Sweden

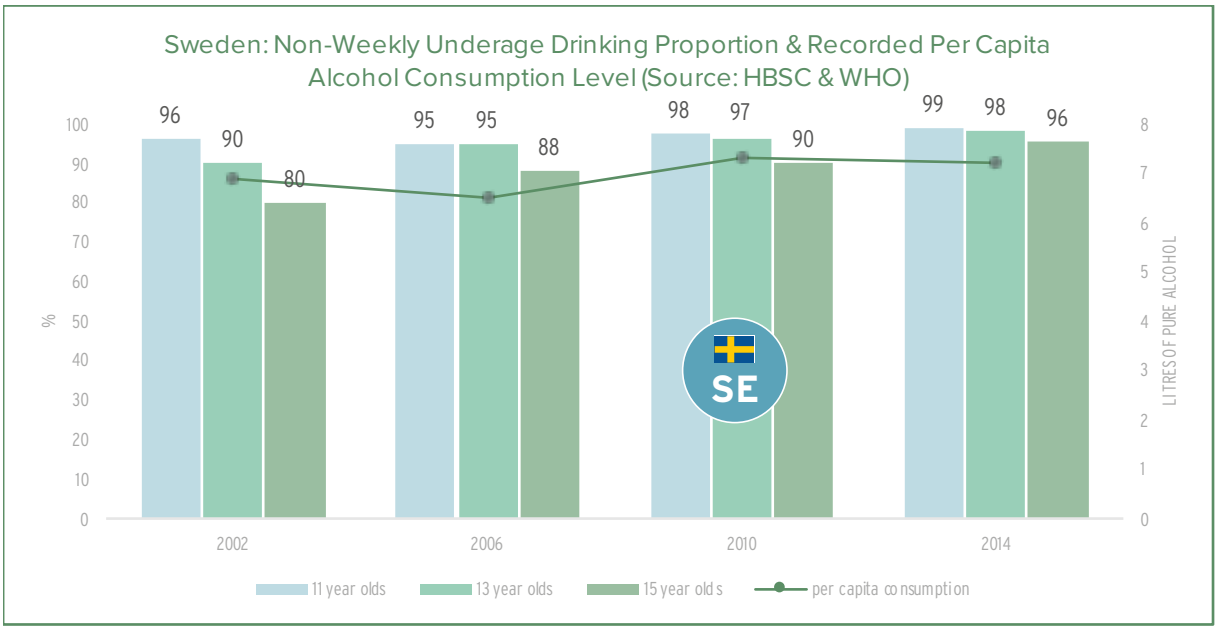
Problem drinking, not only longer-term heavy drinking and heavy episodic drinking, but also underage alcohol consumption should be related to per capita alcohol consumption, according to the population-based theory: the lower the level of per capita alcohol consumption, the lower the level of underage drinking and hence alcohol-related harm. This chapter focuses on Sweden and aims to assess if per capita consumption can explain underage drinking. In this section, we draw mostly on data stemming from the European School Survey Project on Alcohol and Other Drugs (henceforth ESPAD) surveys (a pan-European survey among 15–16-year-olds that is carried out every 4th year; (http://espad.org/reports-documents) and the Health Behaviour in School-Aged Children (henceforth HBSC) surveys (a pan-European survey among 11-, 13, and 15-year-olds; (http://www.hbsc.org/publications/international/).

MAIN FINDINGS

- Weekly alcohol consumption is continuously declining for all age groups (11-, 13-, and 15-year- olds) independently of the level and change in recorded and total per capita alcohol consumption in Sweden.
- No alcohol consumption in the last 30 days reached its highest level in history among 15-16-year-olds in Sweden. According to ESPAD survey data, 3 out of 4 did not consume any alcohol in the last 30 days in 2019.
- Quantities of alcohol consumed at the last drinking day almost halved between 1999 and 2019, reaching the lowest level in history since the start of the ESPAD surveys.
- Heavy episodic drinking (once or more frequently) in the last 30 days also reached a record low level in 2019.
- More than 9 out of 10 surveyed 15-16-year-olds reported never being intoxicated in the last 30 days. However, the speed of this positive trend is slowing down: there was no further improvement between the last two survey waves.
- These positive trends in underage alcohol consumption coincided with stable and slightly increased levels of recorded (and total) per capita alcohol consumption in Sweden. These empirical facts contradict the population-based hypothesis, because, according to the latter, problem consumption, including underage drinking, should follow the trend in per capita alcohol consumption.

An increase in the number of people who indicated zero alcohol consumption in the last week can be observed in all under-aged groups in Sweden between 2002 and 2014, according to the HBSC survey. The biggest positive development can be observed for 15-year-olds.

Figure 72: source (HBSC – http://www.hbsc.org/publications/international/ & WHO – https://www.who.int/data)



This positive trend seems to be independent of the trend/level of recorded per capita alcohol consumption, which becomes more apparent when changing the scale in the chart (see figure 73).

Figure 73: source (HBSC – http://www.hbsc.org/publications/international/ & WHO – https://www.who.int/data)

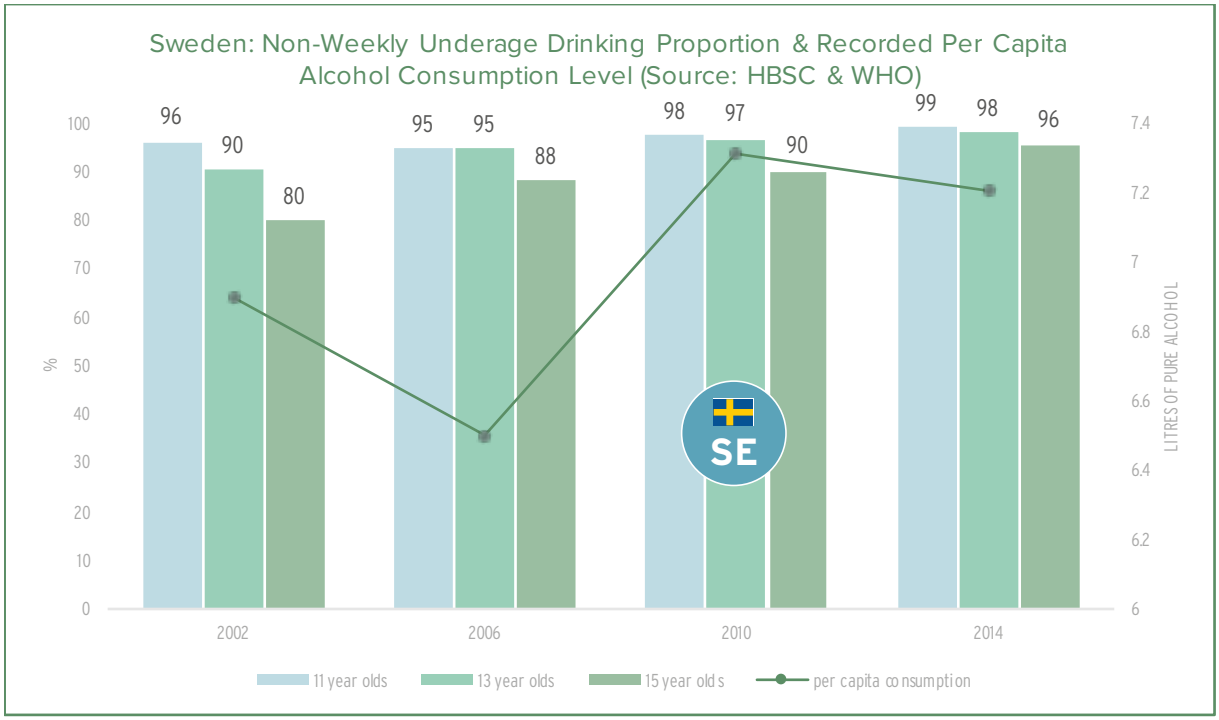
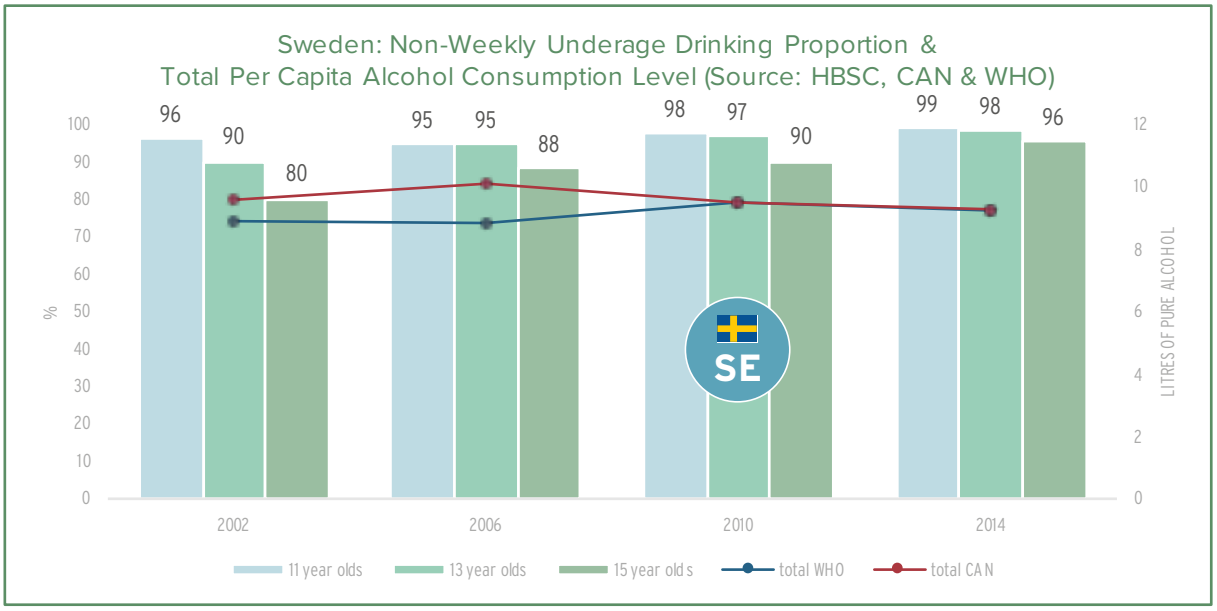


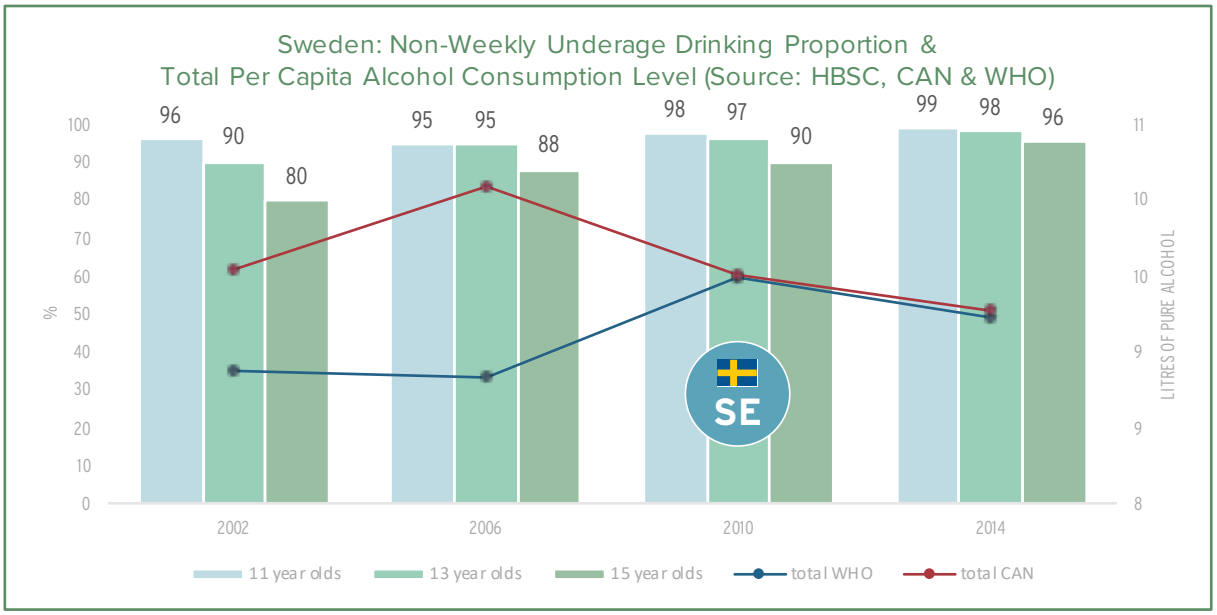
Figure 72 & 73 compared underage drinking changes to levels in recorded per capita alcohol consumption in Sweden and the two indicators appear to be independent from each other. Perhaps, total per capita alcohol consumption levels better explain underage drinking trends in Sweden?

Figure 74: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & HBSC – http://www.hbsc.org/publications/international/)



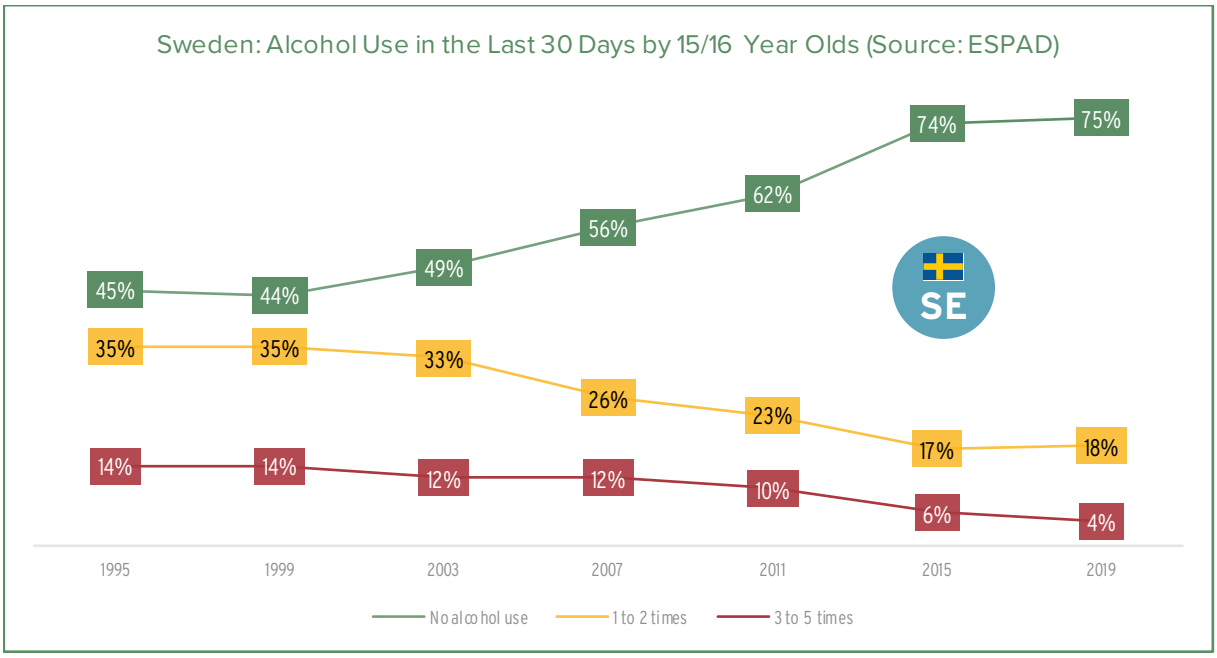
The increasing trend in never reported weekly alcohol consumption by underage people in Sweden seems to also be independent from the change and level of total per capita alcohol consumption. Zooming into figure 74 visualises this even better (see figure 75).

Figure 75: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & HBSC – http://www.hbsc.org/publications/international/)



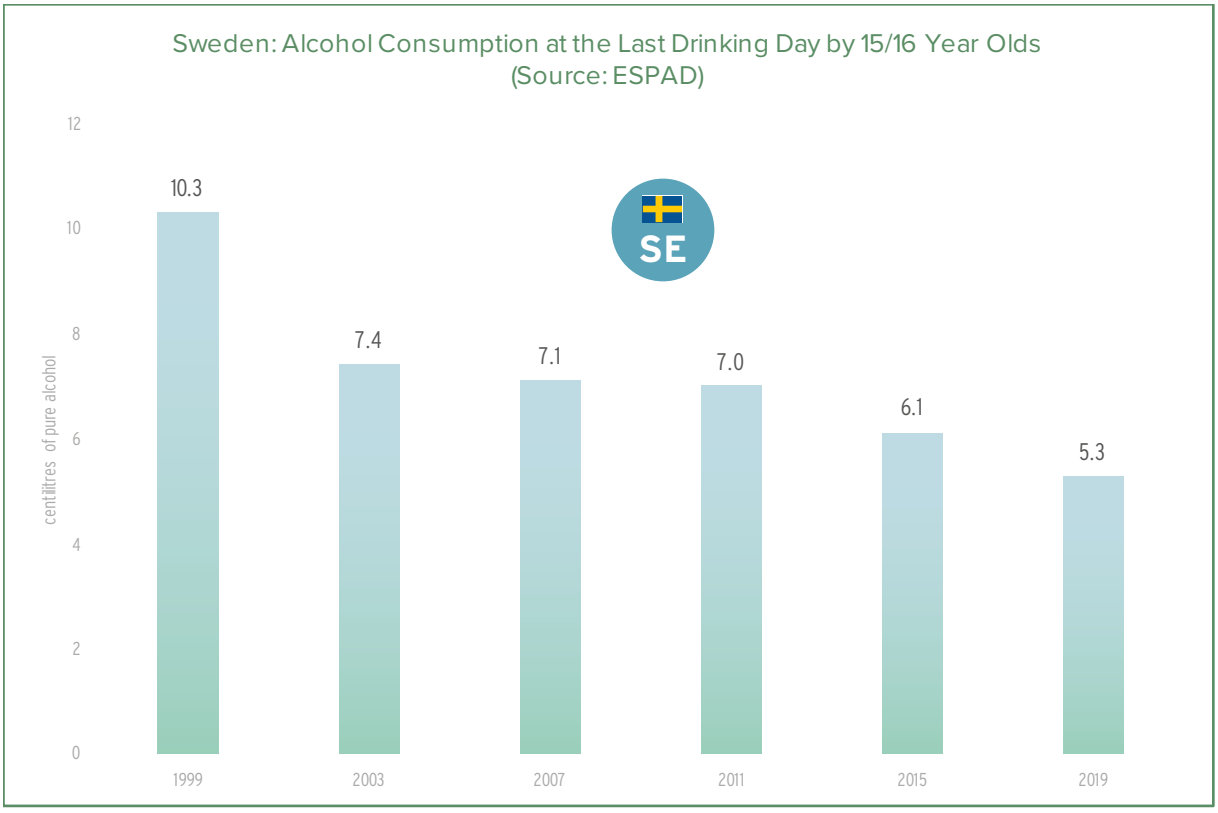
According to ESPAD survey data, it becomes apparent that any alcohol consumption in the last 30 days by 15–16-year-olds in Sweden is on a decline for both 1 to 2 times as well as 2 to 5 times (see figure 76). Moreover, 3 out of 4 reported no alcohol consumption in the last 30 days in 2019.

Figure 76: source (ESPAD survey)



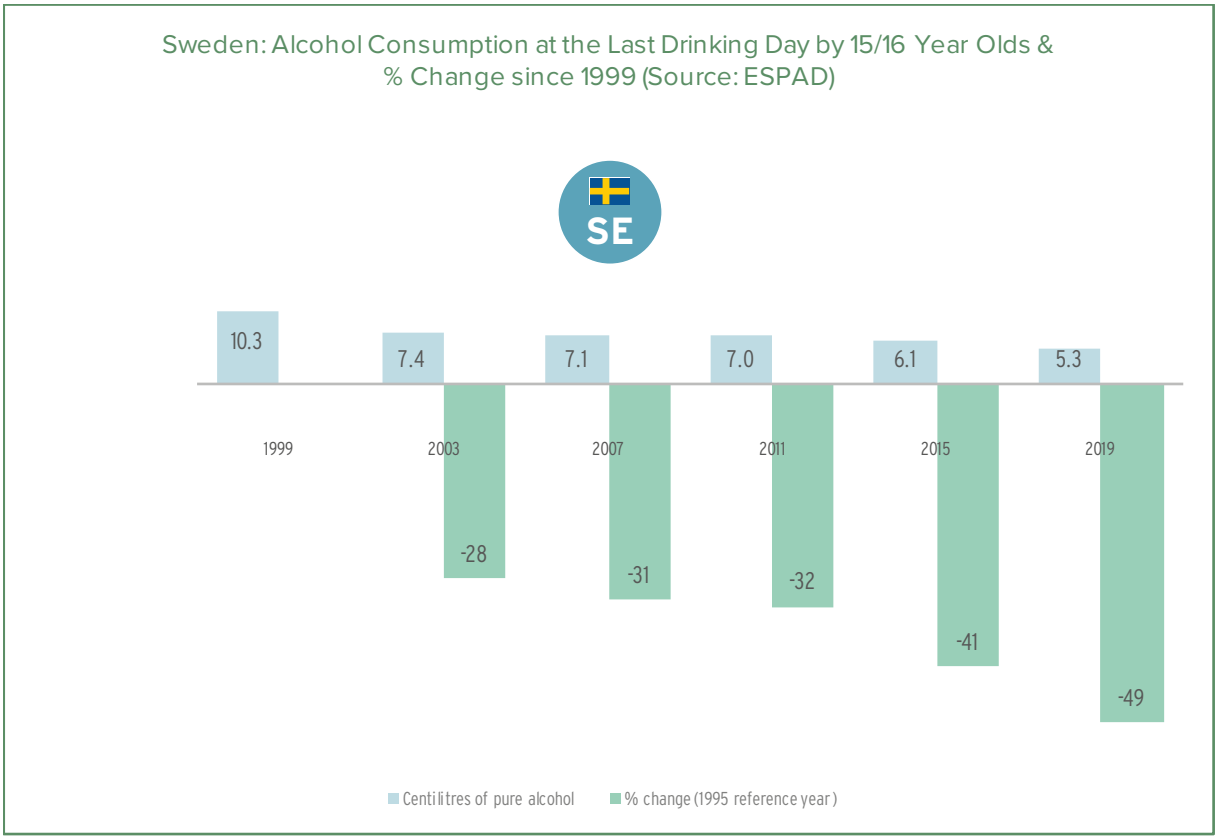
The quantities of consumed alcohol (converted in cl of pure alcohol) at the last drinking day reached the lowest level in history in Sweden for 15-16-year-olds in 2019 (see figure 77). While recorded and total per capita alcohol consumption remained relatively stable and slightly increased between 1999 and 2019 (see figure 72 & 74), alcohol quantities consumed at the last drinking day by 15-16-year-olds in Sweden continuously declined.

Figure 77: source (ESPAD survey)



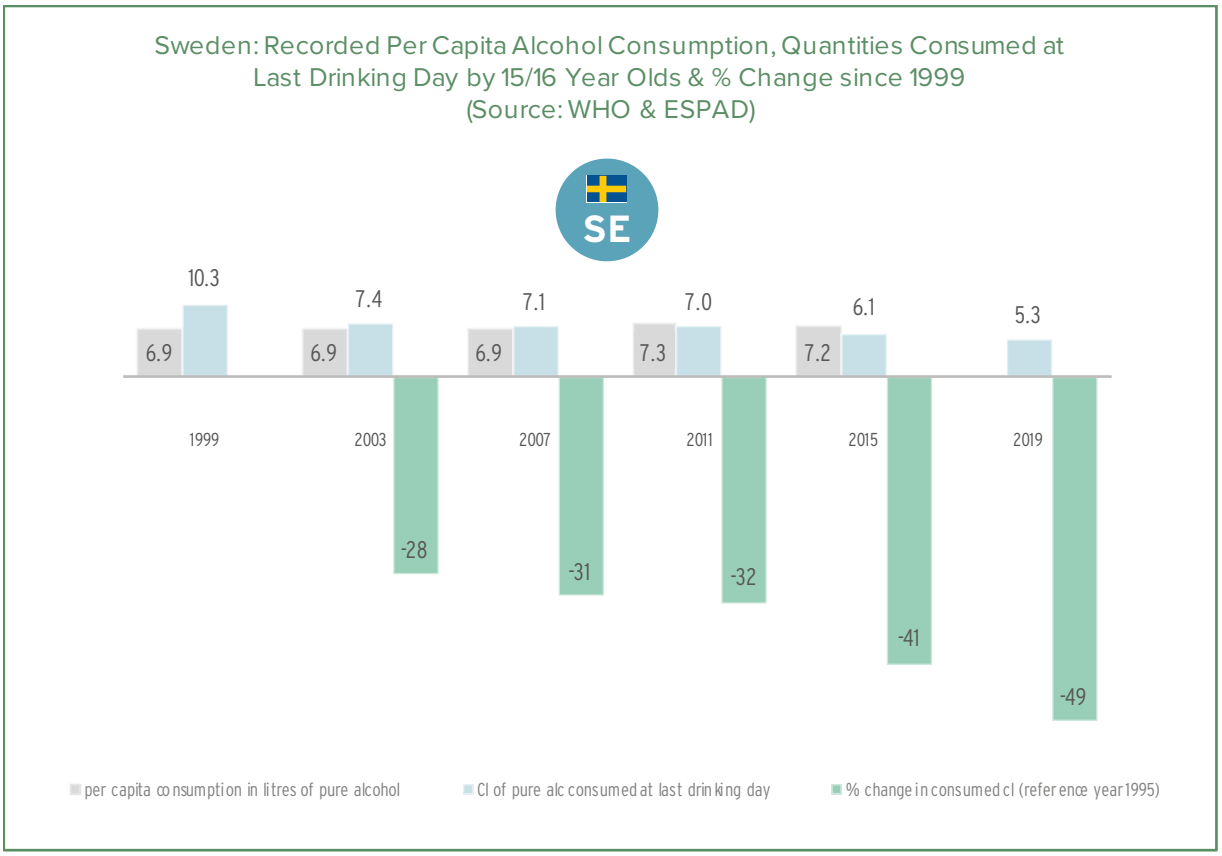
The decline in last day alcohol consumption reached 49% since 1999 in Sweden (see figure 78).

Figure 78: source (ESPAD survey – (% changes calculated by the author))



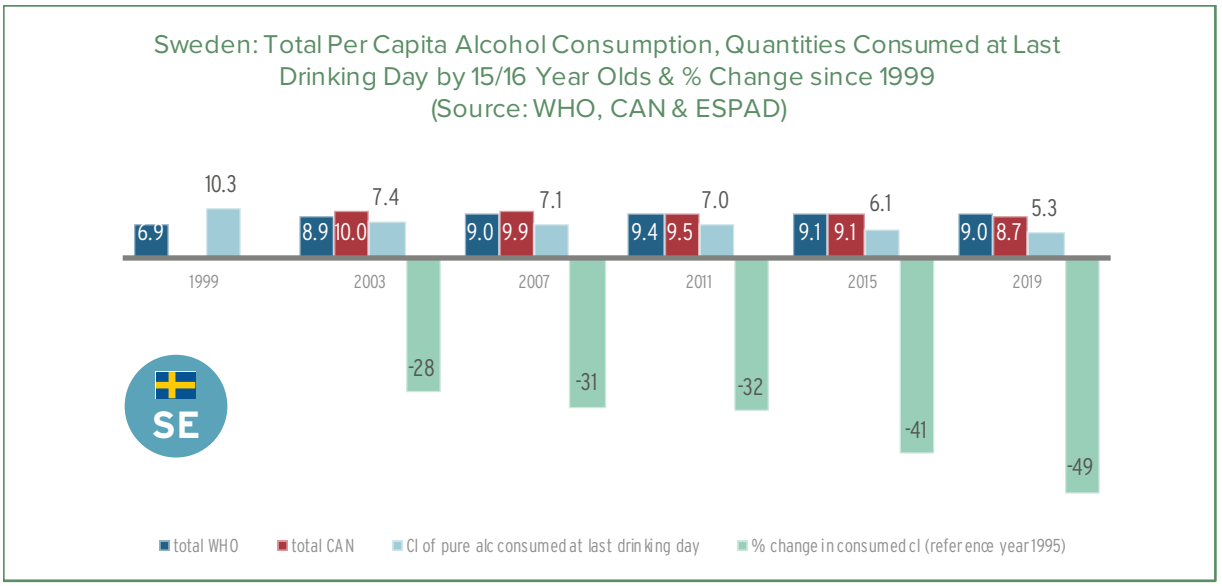
This decline in last day alcohol consumption seems to be independent of recorded per capita alcohol consumption levels in Sweden (see figure 79).

Figure 79: source (WHO – https://www.who.int/data & ESPAD survey – (% changes calculated by the author))



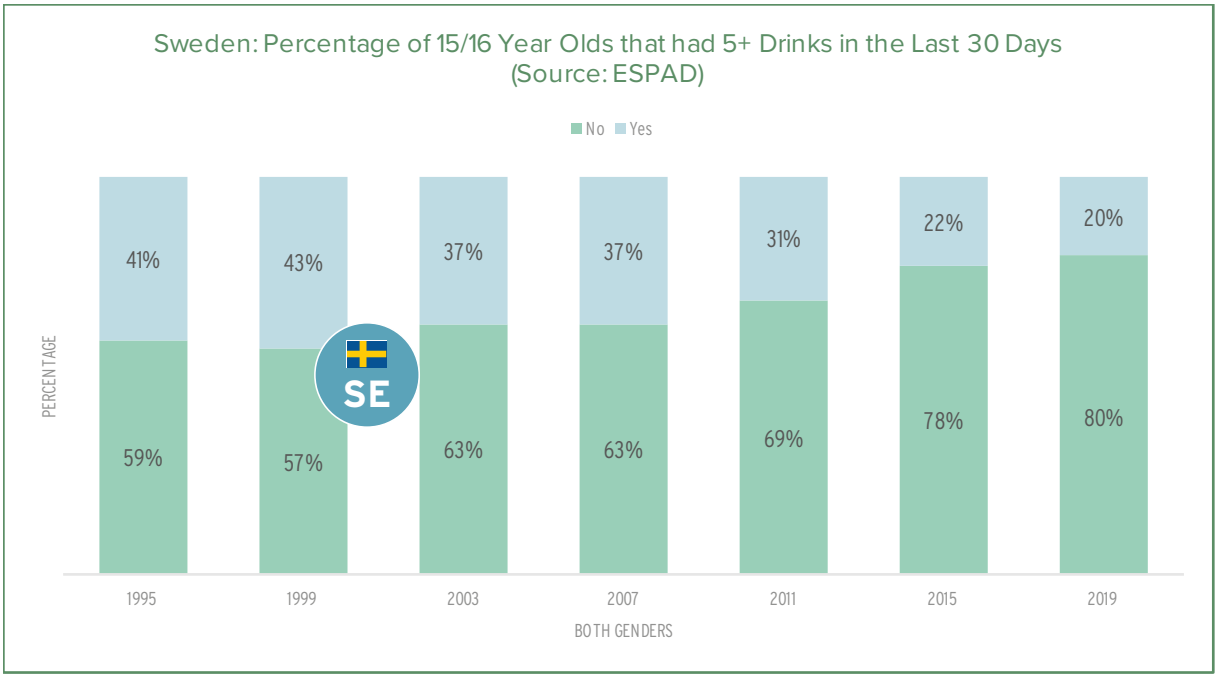
Moreover, the declining trend in quantities consumed at the last drinking day appears to be independent from total per capita alcohol consumption (according to WHO data), though the data point for 1999 does not include unrecorded consumption. The decline in quantities consumed at the last drinking day follows closer CAN total per capita consumption data, though data for 1999 is not available and we know that an increase in total per capita alcohol consumption was reported between 2001 and 2004. In other words, figure 80 suggests that total per capita alcohol consumption levels and changes do not adequately explain the decline in quantities consumed.

Figure 80: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & ESPAD)



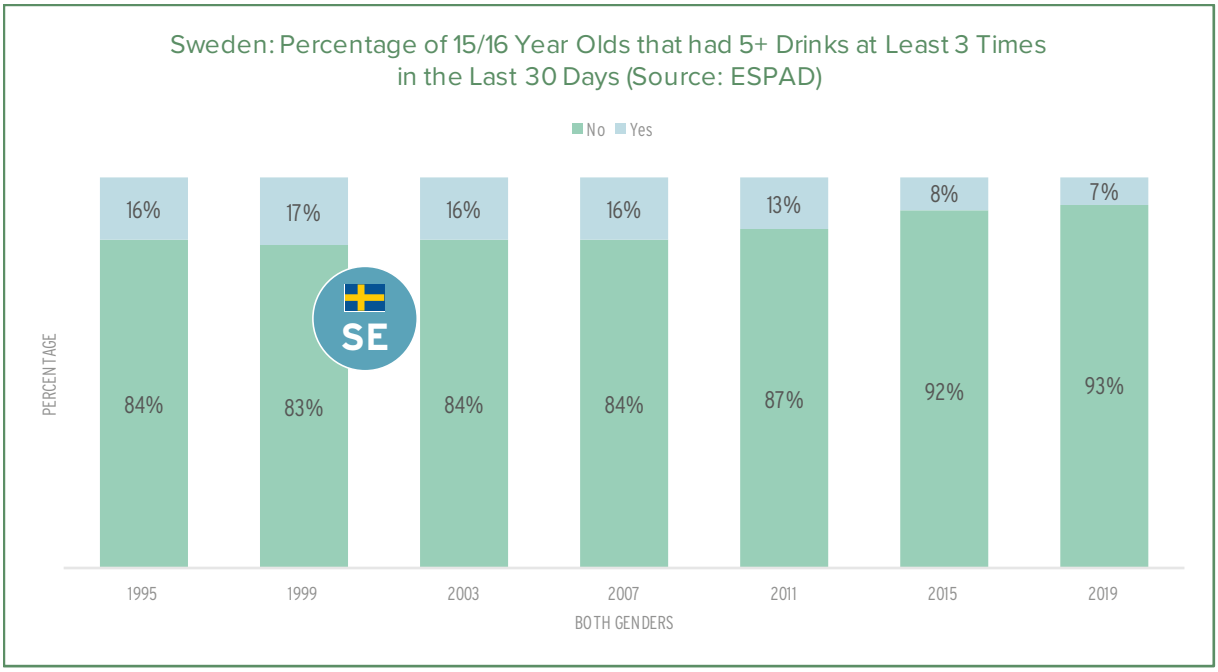
Not only did last day alcohol quantity consumption reach its lowest level in history in Sweden, but heavy episodic drinking did so as well, at least once in the last 30 days (see figure 81). Only 2 out of 10 15-16-year- olds reported at least one heavy episodic drinking event in 2019.

Figure 81: source (ESPAD survey)



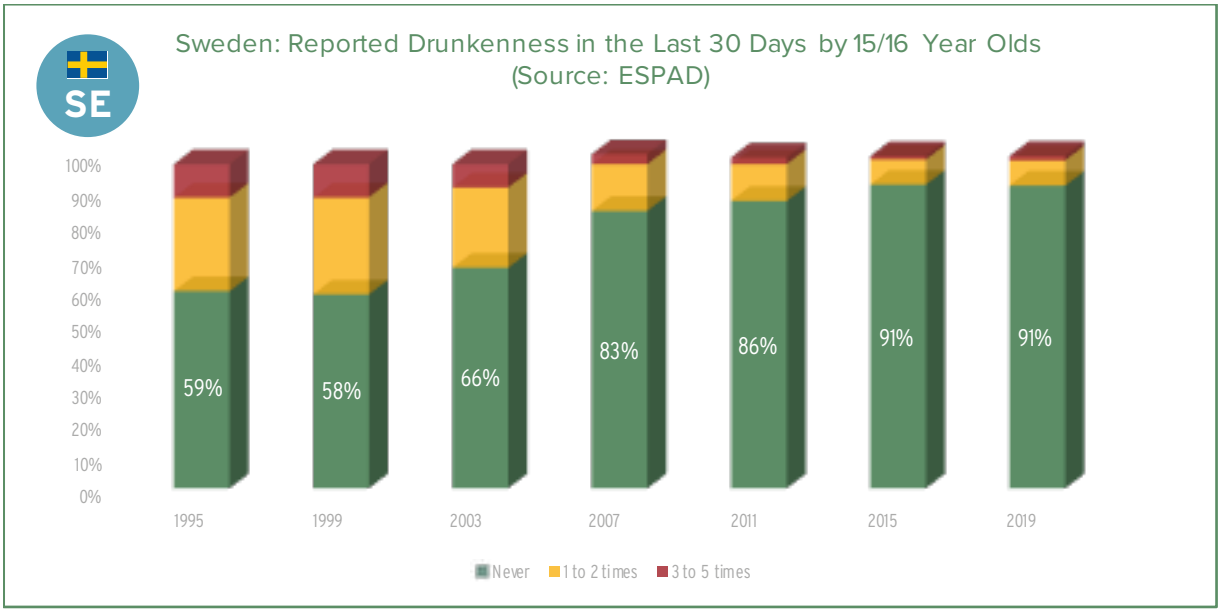
More frequent heavy episodic drinking sessions (at least 3 times in the last 30 days) declined by 56% between 1995 and 2019 in Sweden (or a 59% decline can be observed compared to the peak in 1999). Remember that these positive declining trends coincided with stable and slightly increasing trends in recorded and total per capita alcohol consumption in Sweden.

Figure 82: source (ESPAD survey)



91% of 15–16-year-olds in Sweden reported that they were never drunk in the last 30 days in 2019 (see figure 83). That is to say, more than 9 out of 10 people reported that they were never drunk in the last 30 days in 2019. This represents a 54% increase between 1995 and 2019: it more than doubled.

Figure 83: source (ESPAD survey)



There are significant positive trends as regards underage frequency and quantity of alcohol consumption in Sweden. Moreover, heavy episodic drinking events and intoxication have declined significantly since 1995 and 1999: record lows are measured in 2019. The speed of these positive trends has slowed down between the last and second last survey wave, though. All these positive trends coincided with stable and slightly increased levels of (recorded and total) per capita alcohol consumption in Sweden. Hence, empirical facts from Sweden do not support the population-based theory.

#9 Underage drinking trends in Sweden compared to our selection of countries

Chapter 8 illustrated positive trends in underage drinking in Sweden, despite relatively stable (sometimes declining and increasing levels in total and recorded) per capita alcohol consumption trends. Now, we want to assess, if these positive trends in underage alcohol consumption are unique for Sweden or if similar trends can be observed in selected other countries. Moreover, what role does recorded per capita alcohol consumption play in other countries? These are the questions to be addressed in this chapter.

MAIN FINDINGS

- The proportion of 15-16-year-olds reporting no alcohol consumption in the last 30 days is higher in Nordic countries compared to Mediterranean countries in 2019, but also in the years before. At the same token, the proportion of 15-16-year-olds reporting 1-2 and 3-5 times the consumption of an alcoholic beverage in the last 30 days is lower in Nordic compared to Mediterranean countries.
- Between 1999 and 2019, no alcohol consumption by 15-16-year-olds is on an increase in all selected countries, with no clear trend for Italy (ups-and downs).
- On the last alcohol drinking day, 15-16-year-olds in Nordic countries reported significantly higher levels of alcohol consumption (in cl of pure alcohol) compared to their counterparts in Mediterranean countries in 2019.
- In all selected countries we can observe a declining trend in the quantities of alcohol consumed at the last drinking day by 15-16-year-olds between 1999 and 2019. The most significant decline can be observed in Malta, which coincided with a slight increase in recorded per capita alcohol consumption. In Norway, the country with the lowest level in (recorded and total) per capita alcohol consumption, the declining trend is less strong, and quantities of alcohol consumed on the last drinking day are still the highest in Norway among the countries compared in this report.
- There seems to be no correlation between frequency and quantity of alcohol consumption. While 15-16-year-olds in Mediterranean countries consume alcoholic beverages more frequently compared to their Nordic counterparts, they consumed significantly less alcohol when they drank in 2019 (but also in the years before).
- The ranking of countries as regards the proportion of 15-16-year-olds that reported at least one heavy episodic drinking occasion in the last 30 days has changed between 1999 and 2019. In 1999 the highest proportion was observed in Nordic countries while in 2019, this ranking has switched: now Mediterranean countries are leading the ranking. There is a clear declining trend in heavy episodic drinking at least once in the last 30 days in Nordic countries between 1999 and 2019, which is not the case for Mediterranean countries.
- There is an increasing trend in never reported drunkenness/intoxication in all selected countries between 1999 and 2019 (though the increase levelled off between the last two survey waves). About 9 out of 10 15-16-year-olds reported no intoxication in the last 30 days in 2019 in the selected countries.
- The intoxication rate appears to be unrelated not only to the frequency of alcohol consumption, but also to the level and trends in recorded per capita alcohol consumption in the selected countries.

While the proportion of 15-16-year-olds that reported the consumption of an alcoholic beverage (1-2 times) in the last 30 days is similar for Sweden (18%), Finland (21%) and Norway (16%), it is higher in Italy (24%) and Greece (30%), whereas Malta (21%) has the same level as Finland in 2019 (see figures 84-89). The difference between Nordic and Mediterranean countries is even bigger, when looking at 3-5 times alcohol consumption in the last 30 days in 2019. The same applies to no alcohol consumption in the last 30 days in 2019.

Figure 84: source (ESPAD survey)

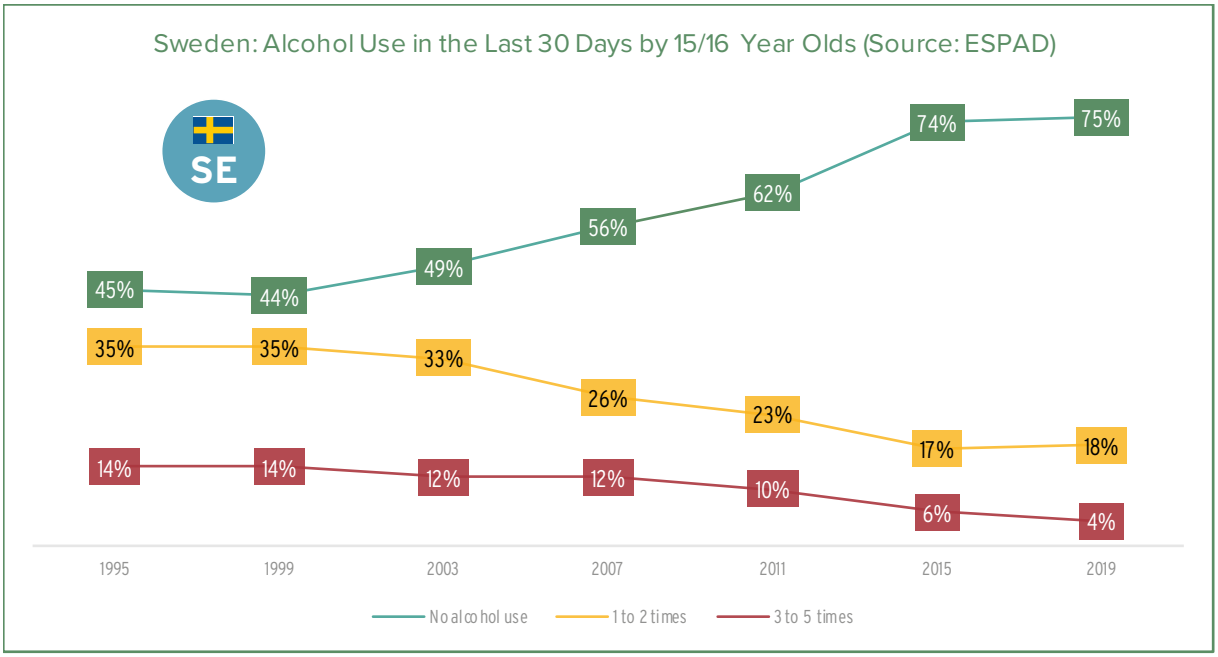


Figure 85: source (ESPAD survey)

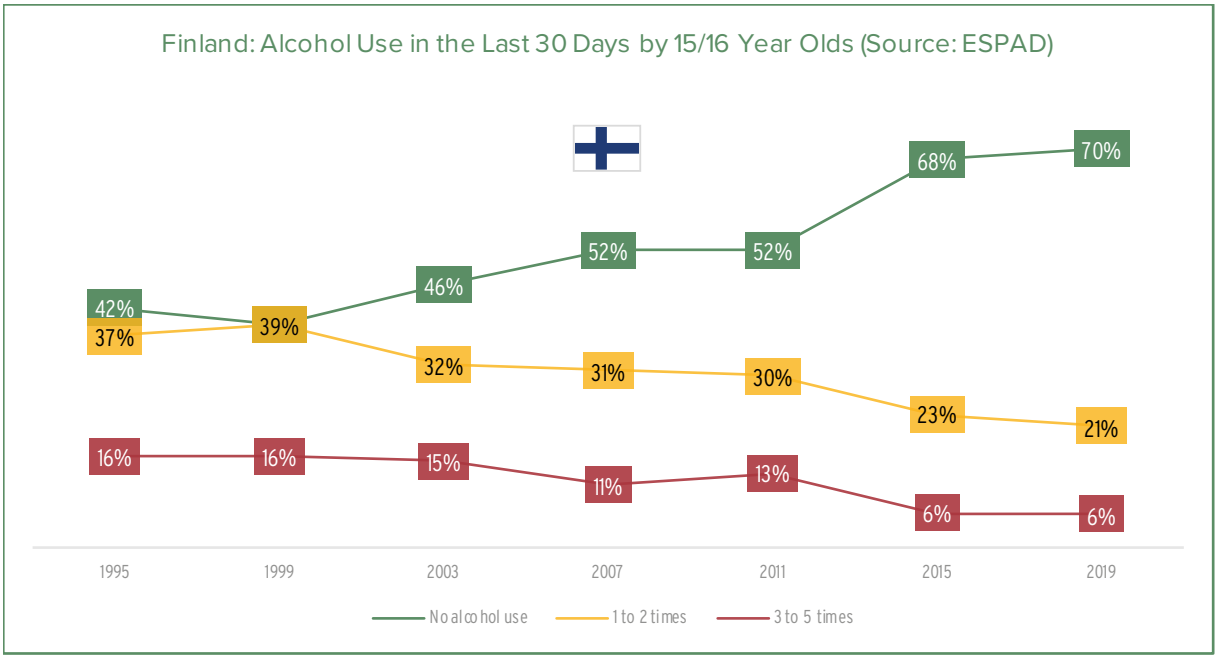


Figure 86: source (ESPAD survey)

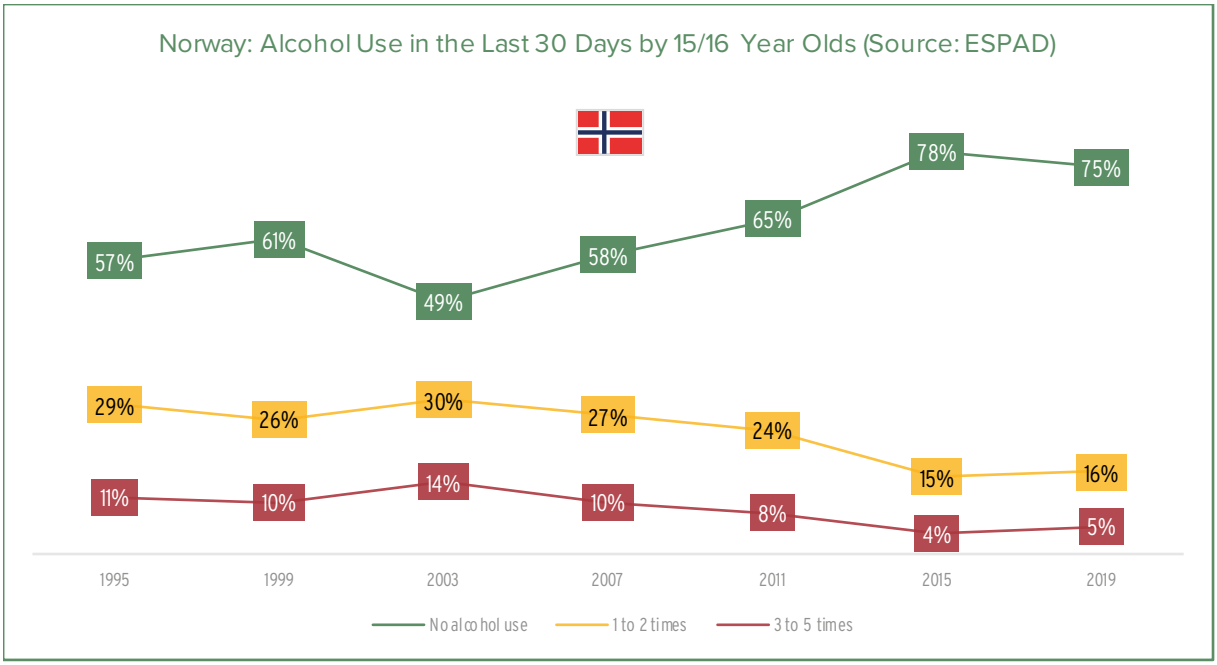


Figure 87: source (ESPAD survey)

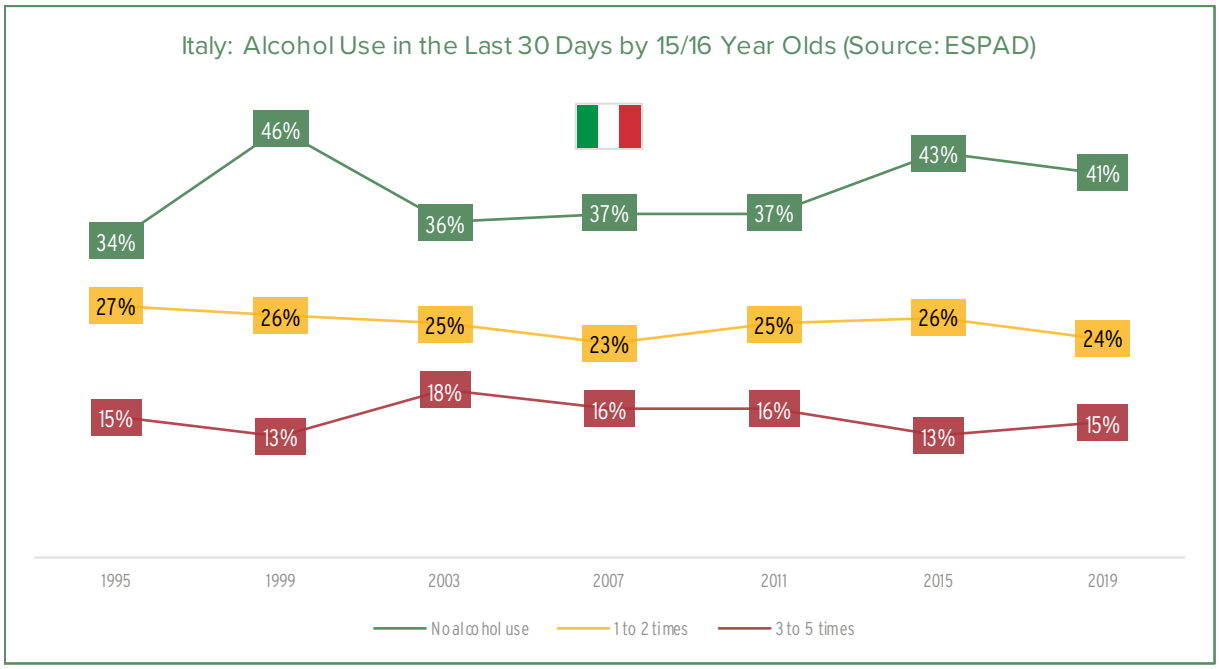


Figure 88: source (ESPAD survey)

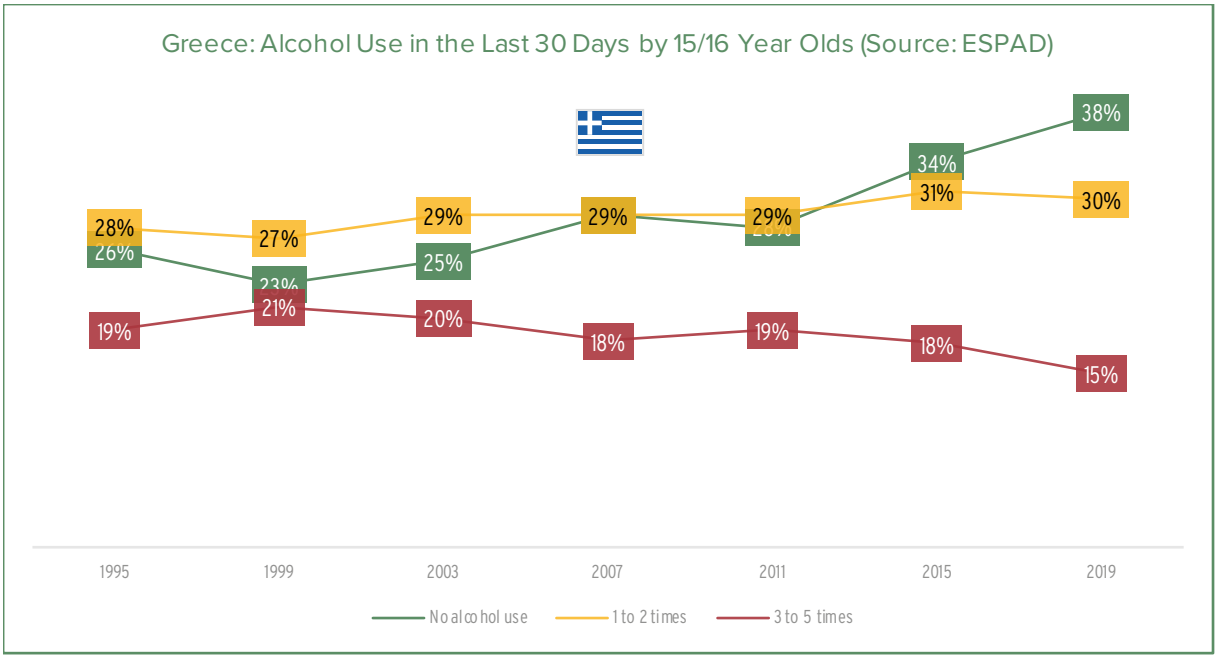
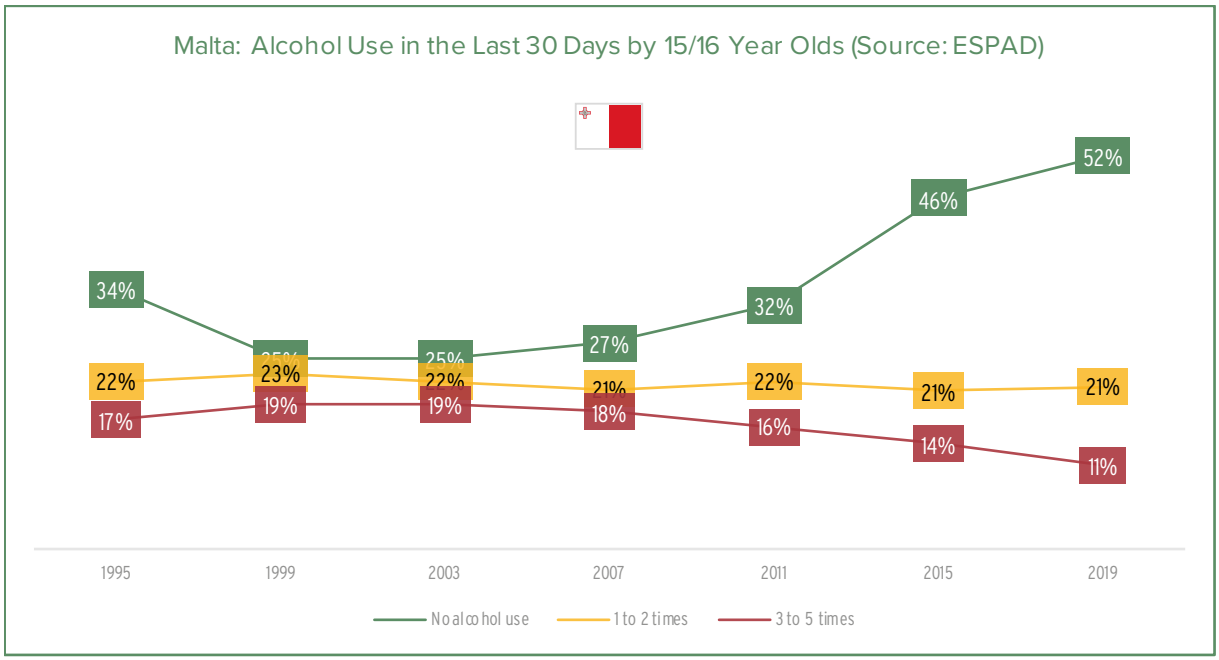


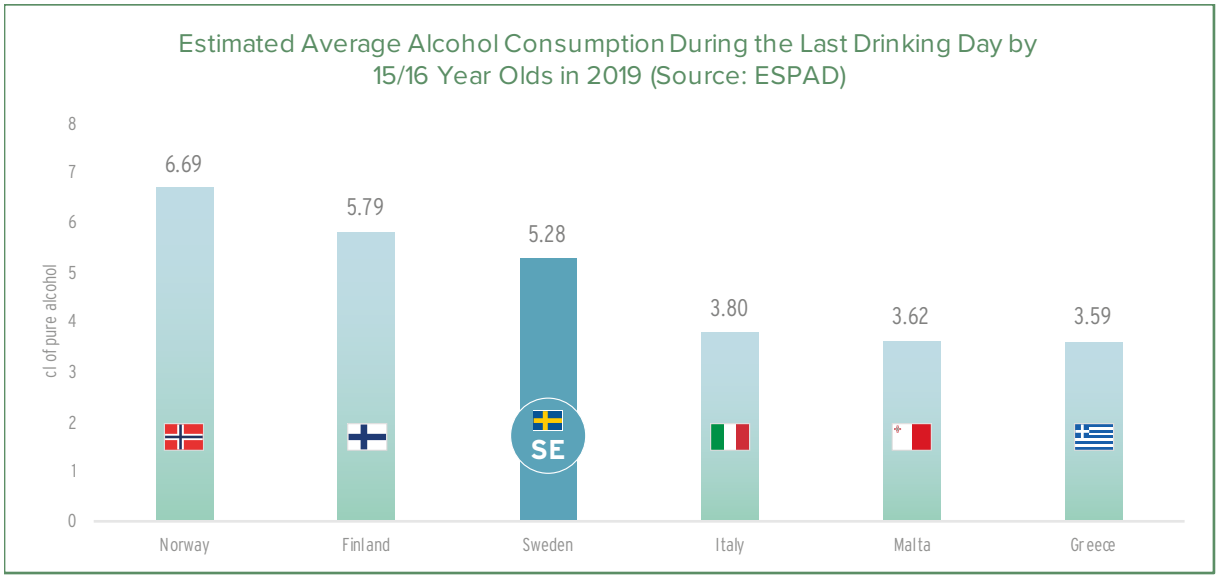
Figure 89: source (ESPAD survey)



There is an increasing trend in no alcohol consumption in the last 30 days in all selected countries, whereas the trend in Italy is not that clear (ups and downs). These trends cannot be explained by recorded per capita alcohol consumption trends/levels, so we need to look for alternative explanations, such as possible cultural differences: perhaps parents in Mediterranean countries are less strict and allow their 15–16-year-old children to consume an alcoholic beverage for dinner from time to time.

However, if we look at the quantities consumed on the last drinking day, it becomes apparent that significantly more is consumed in Nordic countries compared to Mediterranean ones (see figure 90) in 2019.

Figure 90: source (ESPAD survey)



Trend data on last day alcohol quantity consumption reveals that it is declining (though starting at different levels) in all selected countries (Greece had an increase in one year, in 2003). The sharpest decline can be observed for Malta (-64% between 1999 and 2019), although recorded per capita alcohol consumption was on an increase during these years in Malta. The decline was least strong in Italy. However, Italy had the lowest level of alcohol consumption on the last drinking day in 1999 among the countries compared here. Norway, with the lowest level of total and recorded per capita alcohol consumption in the EU+ region, stands out with the second-lowest decline among the countries compared here, although it started at a relatively high level in 1999 (see figure 78 & figures 91-95).

Figure 78 (copied from the chapter above): source (ESPAD survey – (% changes calculated by the author))

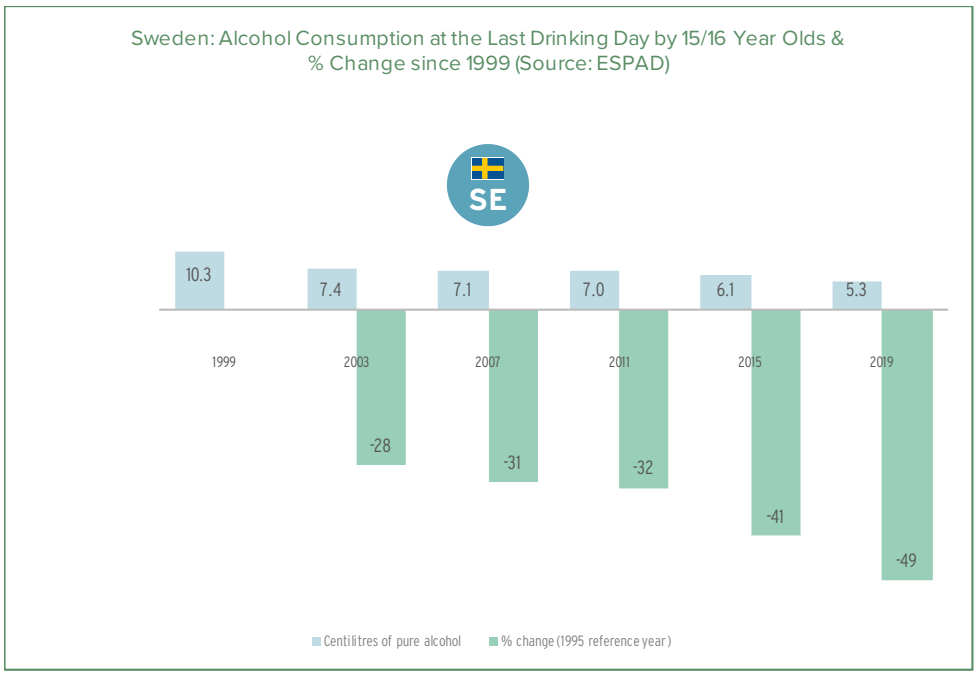


Figure 91: source (ESPAD survey (% changes calculated by the author))

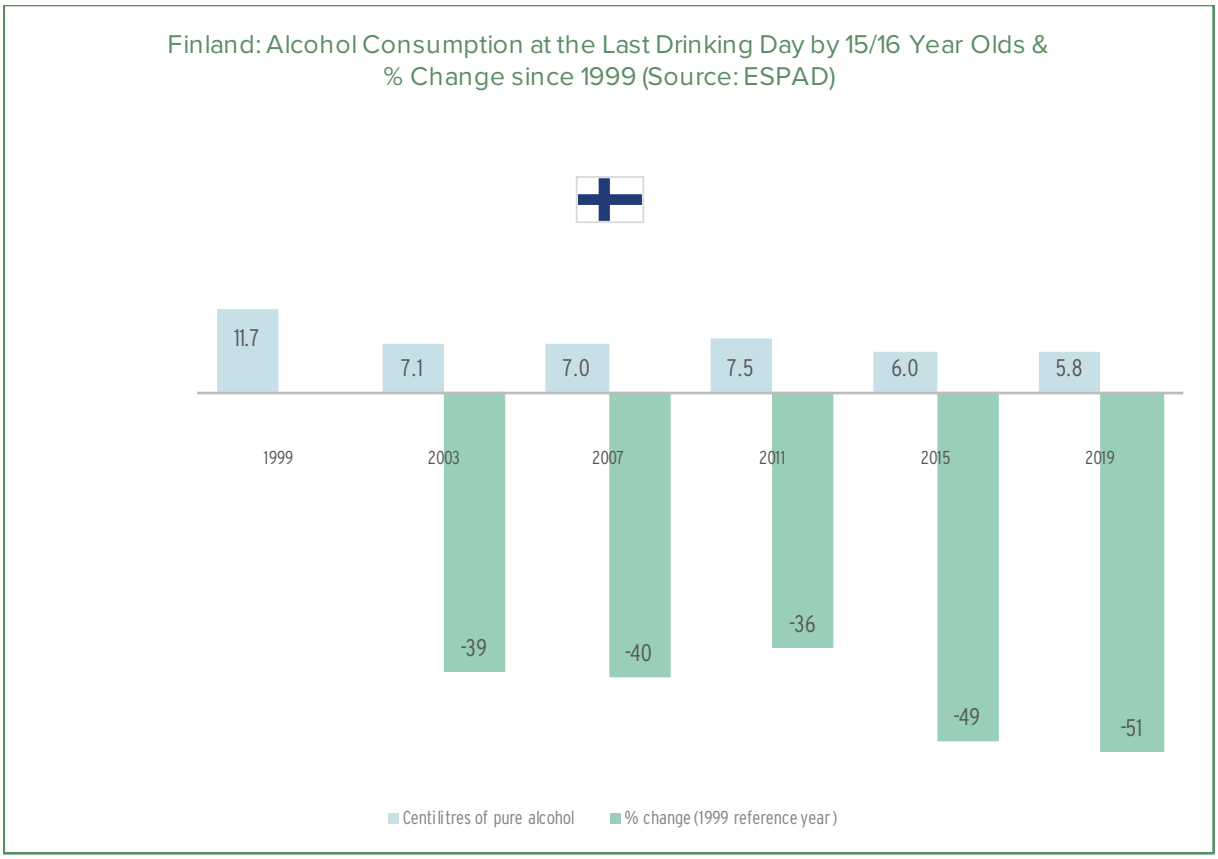


Figure 92: source (ESPAD survey (% changes calculated by the author))

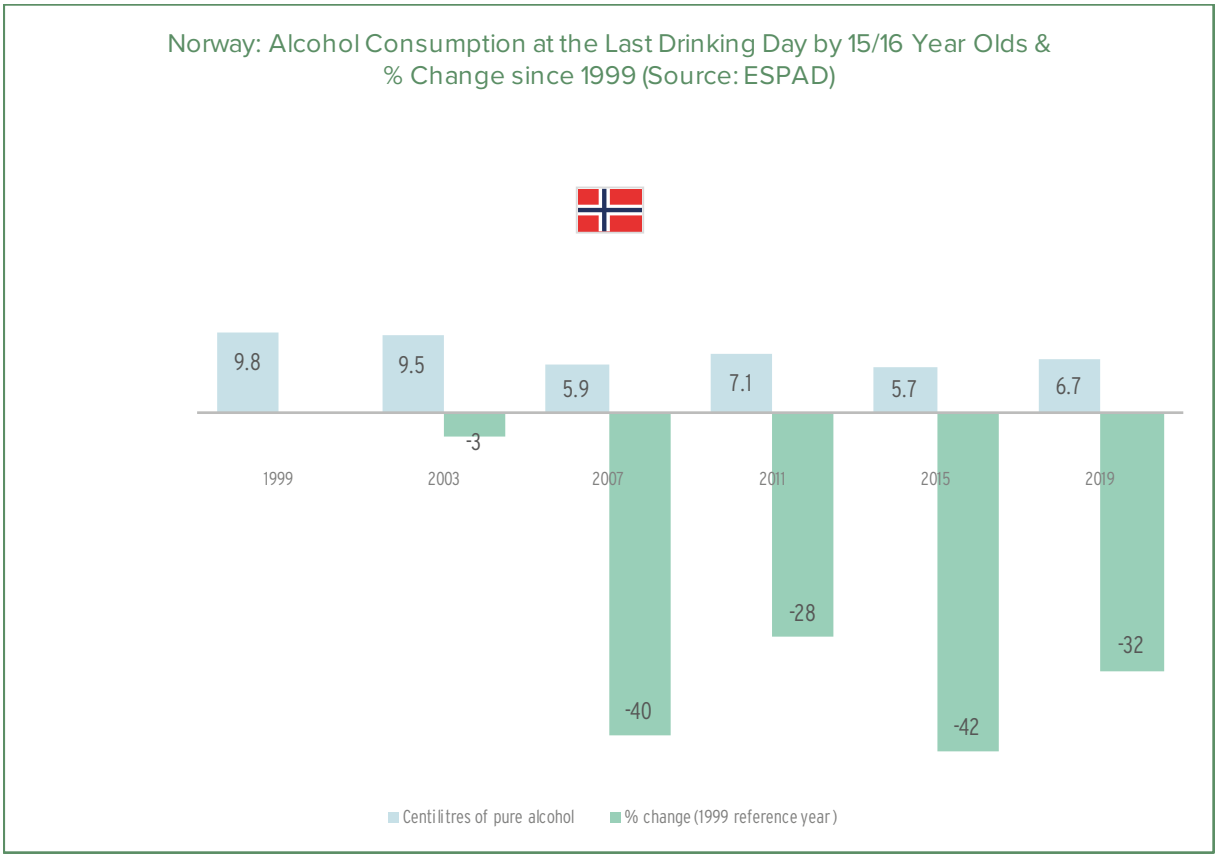


Figure 93: source (ESPAD survey (% changes calculated by the author))

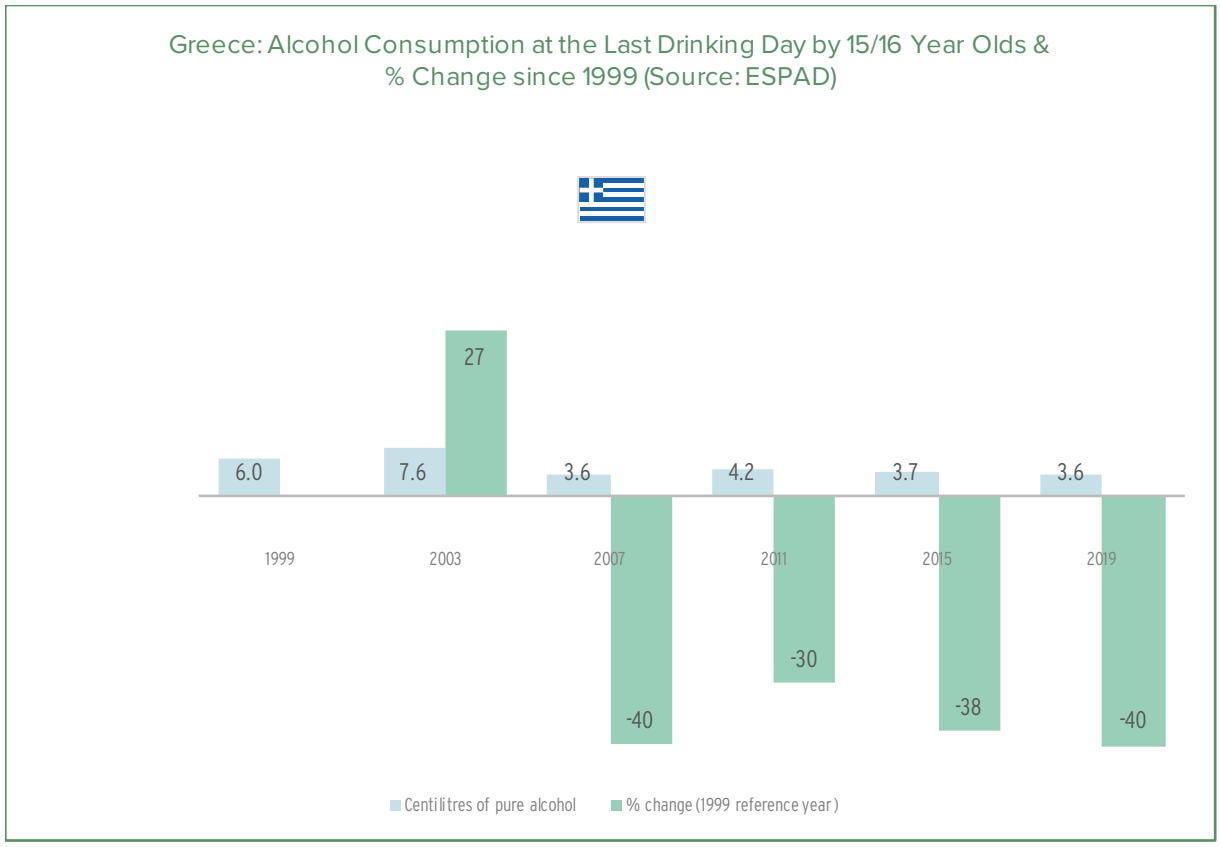


Figure 94: source (ESPAD survey (% changes calculated by the author))

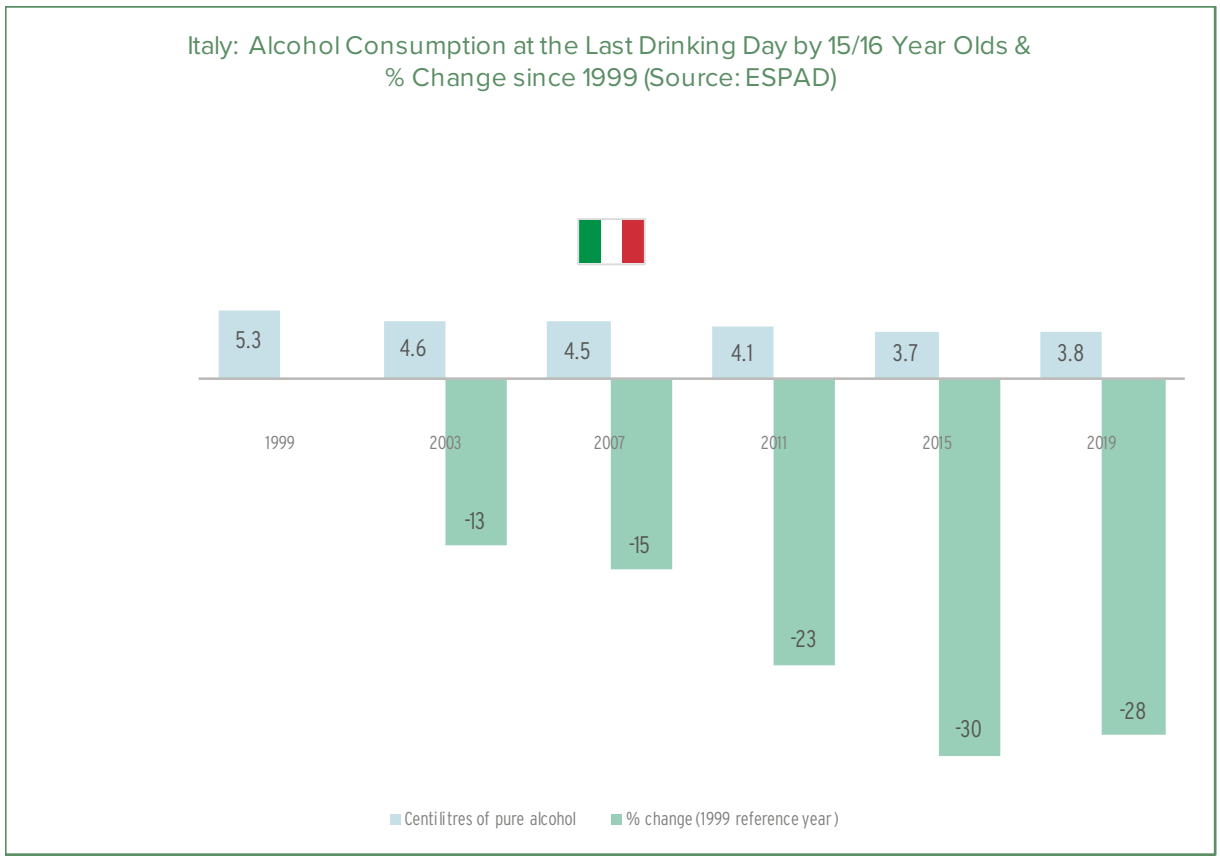
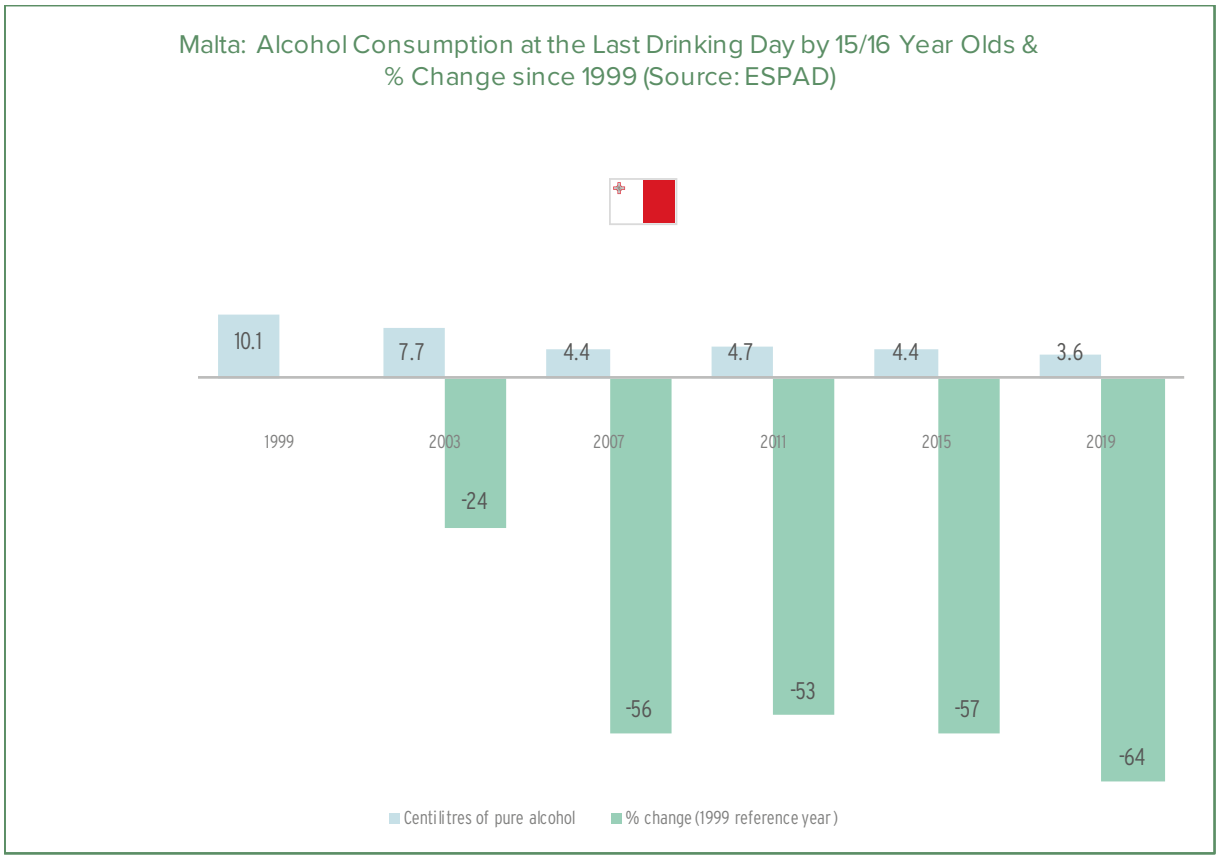


Figure 95: source (ESPAD survey (% changes calculated by the author))



Looking at the frequency (how often a 15-16-year-old consumes an alcoholic beverage within one month) and the quantities of alcohol (converted into cl of pure alcohol on the last drinking day) consumed, it becomes apparent that less alcohol is consumed in the Mediterranean compared to Nordic countries by 15-16-year-olds in 2019. For frequency, it is the other way around (see figure 96).

Figure 96: source (ESPAD survey)

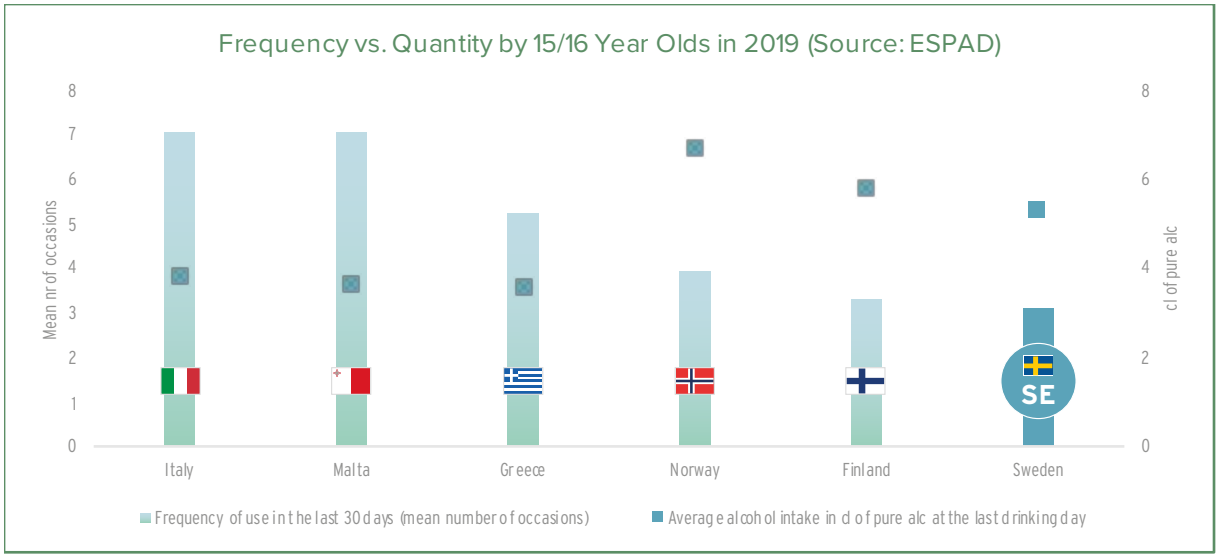


Figure 97 & 98 show the proportion of 15-16-year-olds in the selected countries that reported at least one heavy episodic drinking occasion in the last 30 days over time. Figure 97 ranks countries with the highest to lowest proportion based on the year 1999, whereas figure 98 sorts countries with the highest to the lowest proportion based on the year 2019.

Figure 97: source (ESPAD survey)

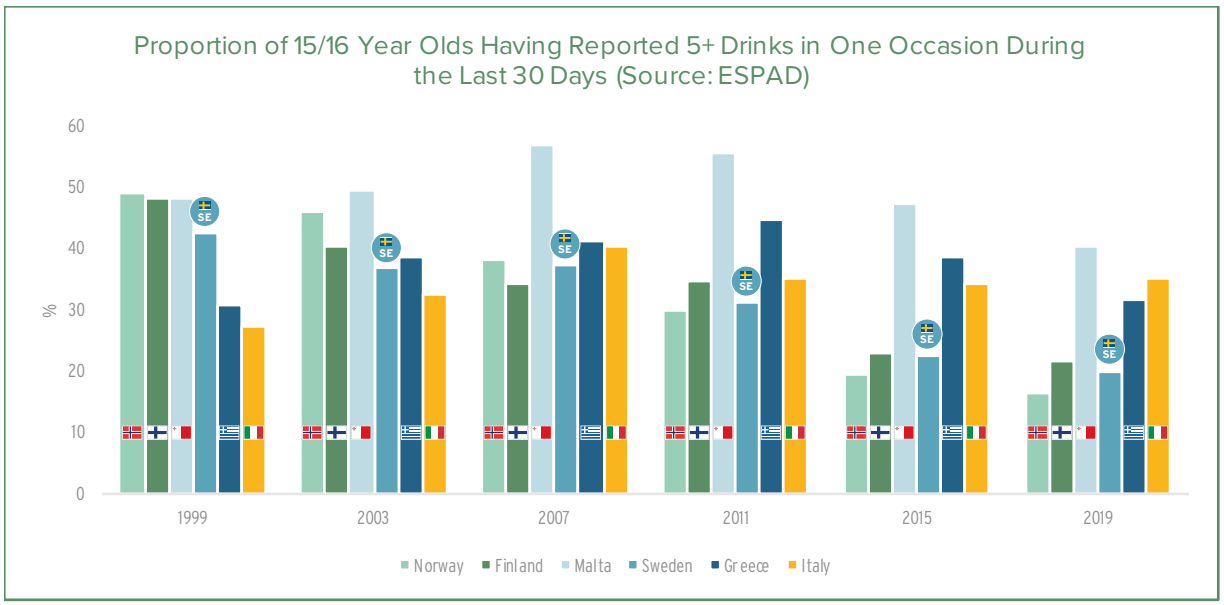
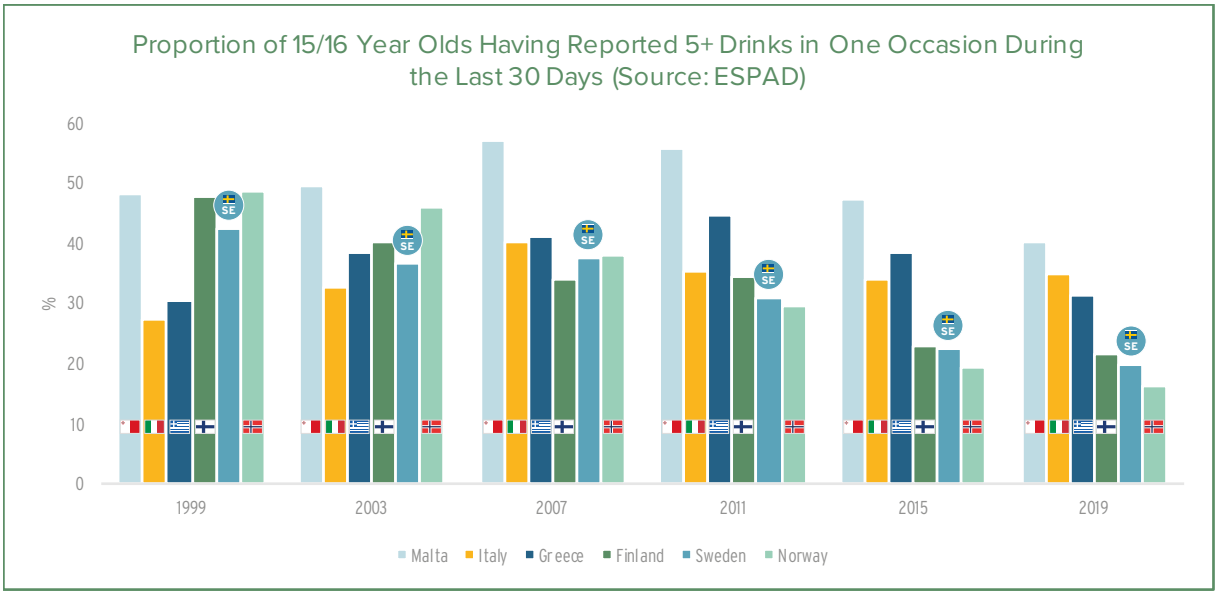


Figure 98: source (ESPAD survey)

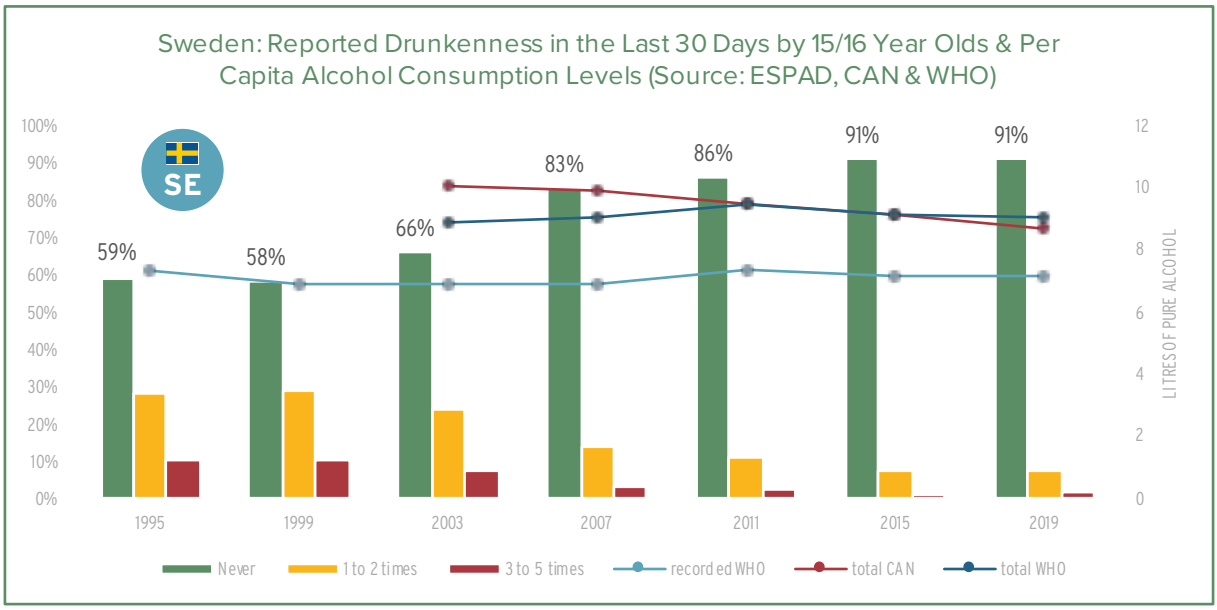


It is interesting to note that the ranking from the highest proportion of heavy episodic drinkers among 15-16-year-olds in 1999 (Norway, Finland, Malta, Sweden, Greece, and Italy) has changed in 2019 to Malta, Italy, Greece, Finland, Sweden, and Norway. In other words, the proportion that reported at least one heavy episodic drinking occasion is now higher in Mediterranean countries compared to Nordic countries.

Never reported drunkenness in the last 30 days is close to 90% in all considered countries in 2019, meaning 1 in 10 appears to be drunk at least once in the last 30 days in the respective countries. To put it differently, 9 in 10 are not drunk at least once in the last 30 days. While the levels of never reported drunkenness was already relatively high in Mediterranean countries since 1995, a positive trend can be

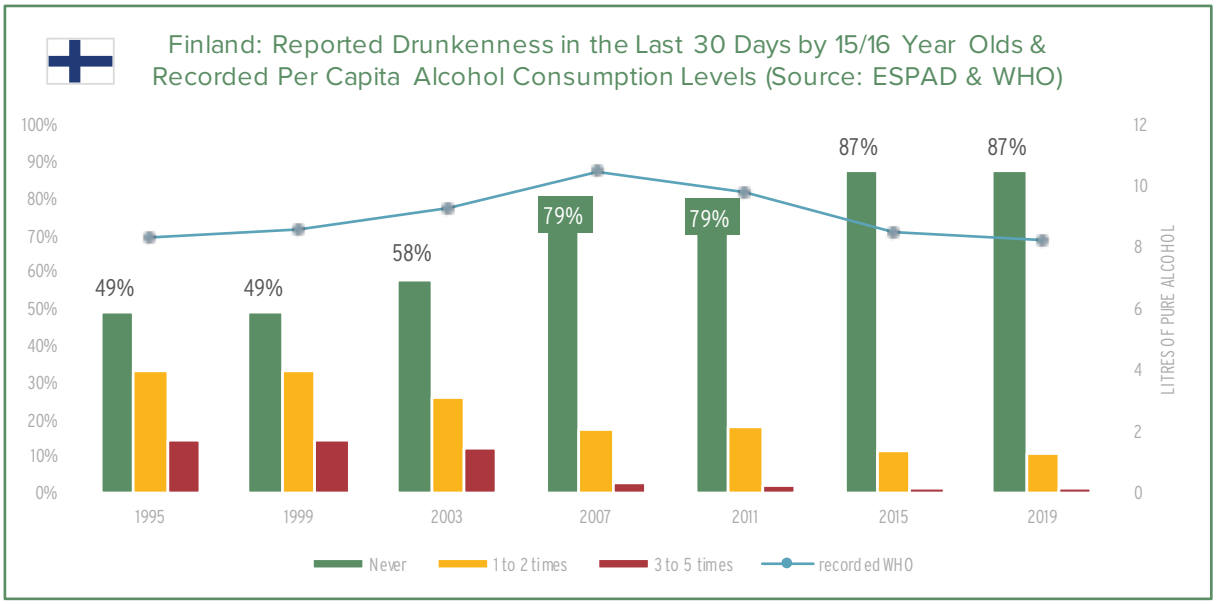
observed in each country, irrespective of the level and trend in recorded per capita alcohol consumption. Figure 99 shows underage drinking trends for Sweden and compares them to recorded as well as total per capita alcohol consumption when data was available referring to WHO and CAN data.

Figure 99: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & ESPAD survey)



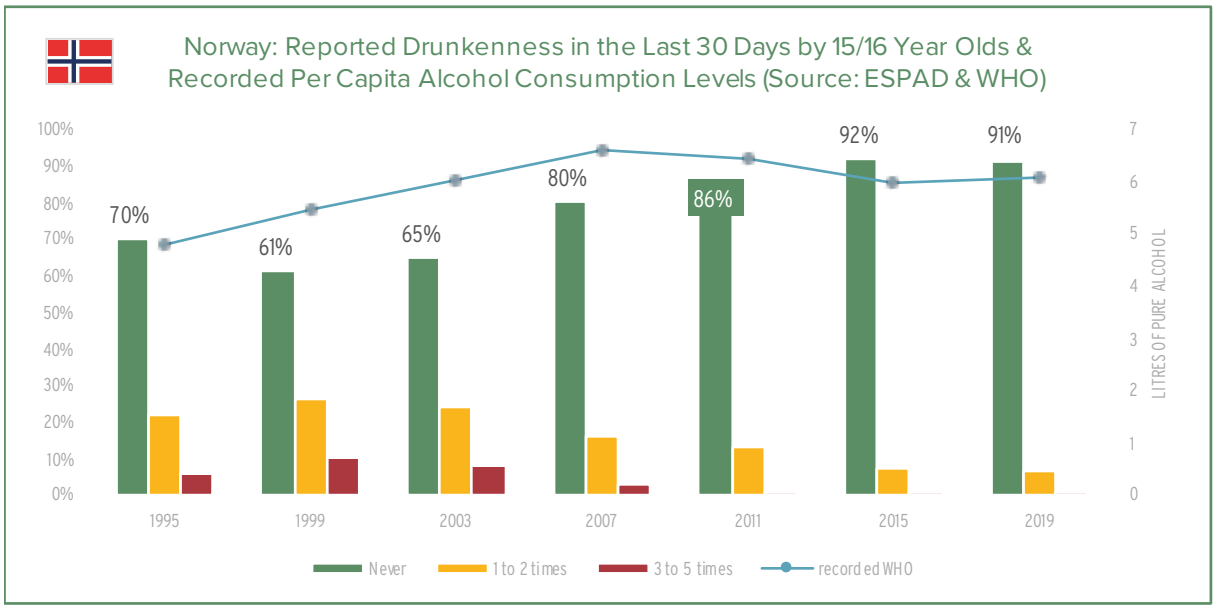
It becomes apparent that never reported drunkenness is on an increase in Sweden, while the frequency of drunkenness in the last 30 days is declining. This trend coincides with a declining trend in total per capita alcohol consumption (according to CAN data, though only 4 data points are available). However, total per capita alcohol consumption goes in the opposite direction between 2003 and 2011, according to WHO data, and recorded per capita alcohol consumption did not change significantly between 1995 and 2019. Recall from chapter 1 that SoRAD data suggests an increase in total per capita alcohol consumption after Sweden joined the EU in 1995 until the early 2000s, which again goes in the opposite direction compared to reported drunkenness.

Figure 100: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & ESPAD survey)



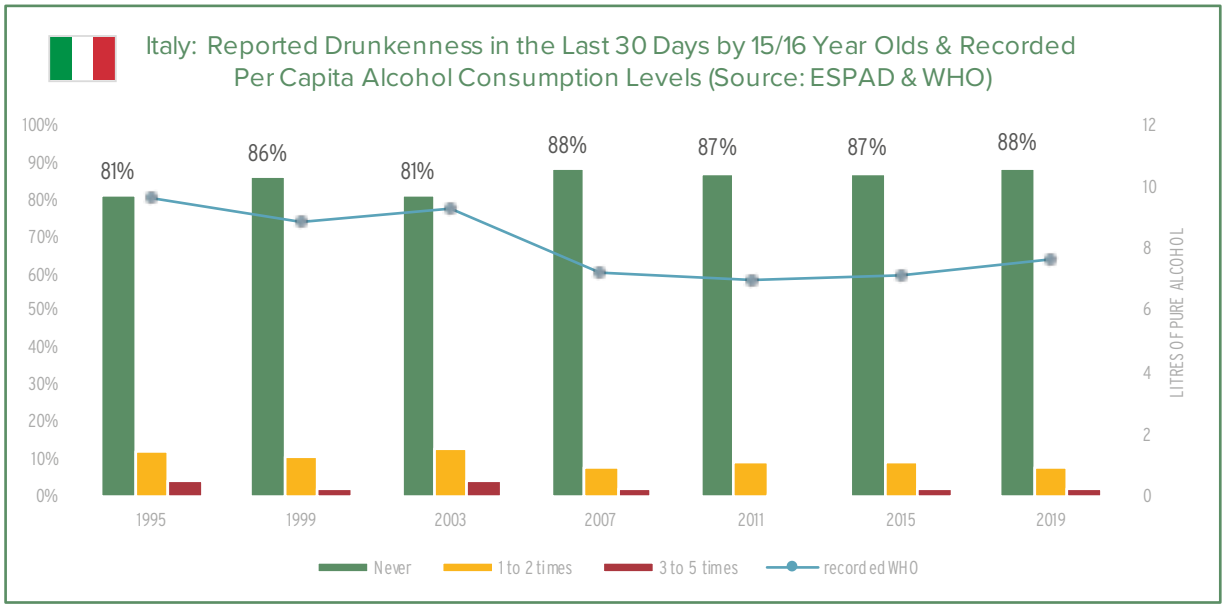
An increase in recorded per capita alcohol consumption between 1995 and 2007 coincided with a decrease in reported drunkenness, which continued to decrease until 2019. From 2007 to 2019 both recorded per capita alcohol consumption and reported drunkenness decreased in Finland.

Figure 101: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & ESPAD survey)



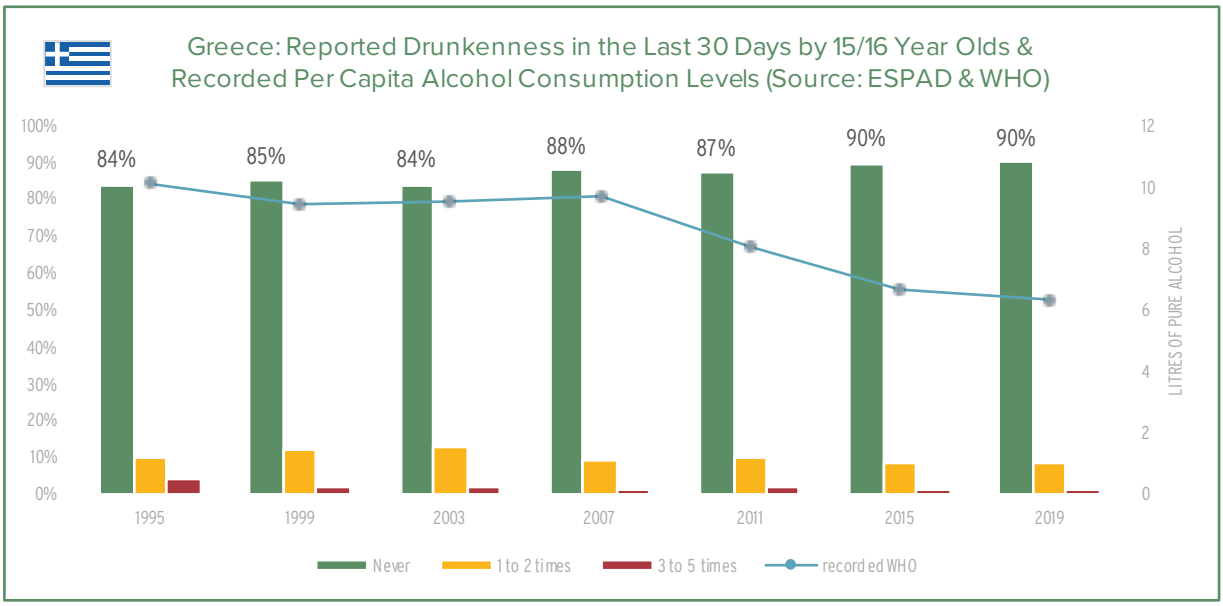
Also in Norway, the trend in recorded per capita alcohol consumption does not coincide or explain the declining trend in reported drunkenness.

Figure 102: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & ESPAD survey)



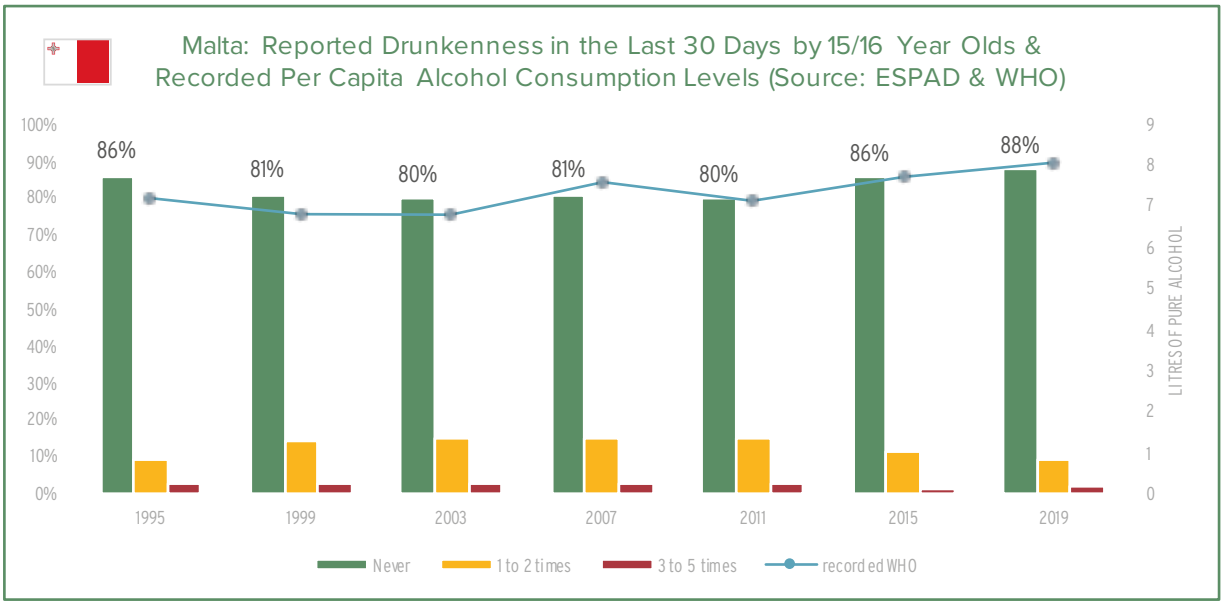
As for Norway, the same applies to Italy, especially if you recall from chapter 5, figure 50, that total per capita alcohol consumption increased by 8% between 2010 and 2016, according to WHO data.

Figure 103: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & ESPAD survey)



In Greece, the declining trend in reported drunkenness coincided with stable and declining trends in recorded per capita alcohol consumption. However, recall from chapter 5 that total per capita alcohol consumption increased by 10% between 2010 and 2016, according to WHO data. In other words, while total per capita alcohol consumption increased, reported drunkenness declined.

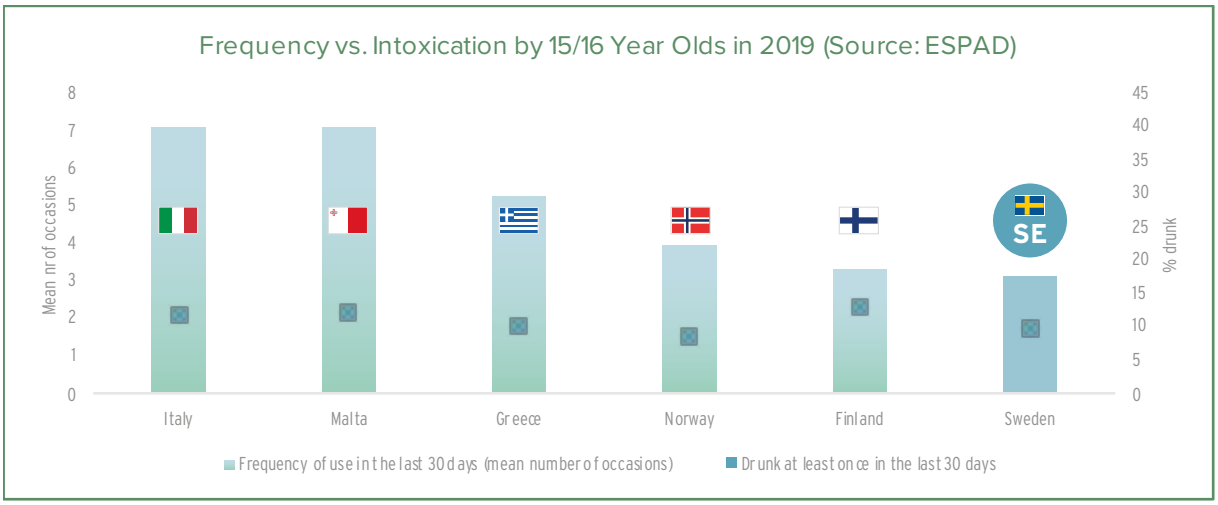
Figure 104: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & ESPAD survey)



In Malta, reported drunkenness increased when recorded per capita alcohol consumption decreased and vice versa.

In 2019, the proportion of reported drunkenness is similar in all considered countries, despite the fact that in Mediterranean countries alcohol consumption is more frequent than in Nordic countries among 15-16-year-olds (see figure 105).

Figure 105: source (ESPAD survey)



This indicates that reported intoxication is not only independent of per capita alcohol consumption levels and trends, but also independent of the reported frequency of alcohol consumption.

#10 Per capita alcohol consumption & alcohol-related harm in Sweden

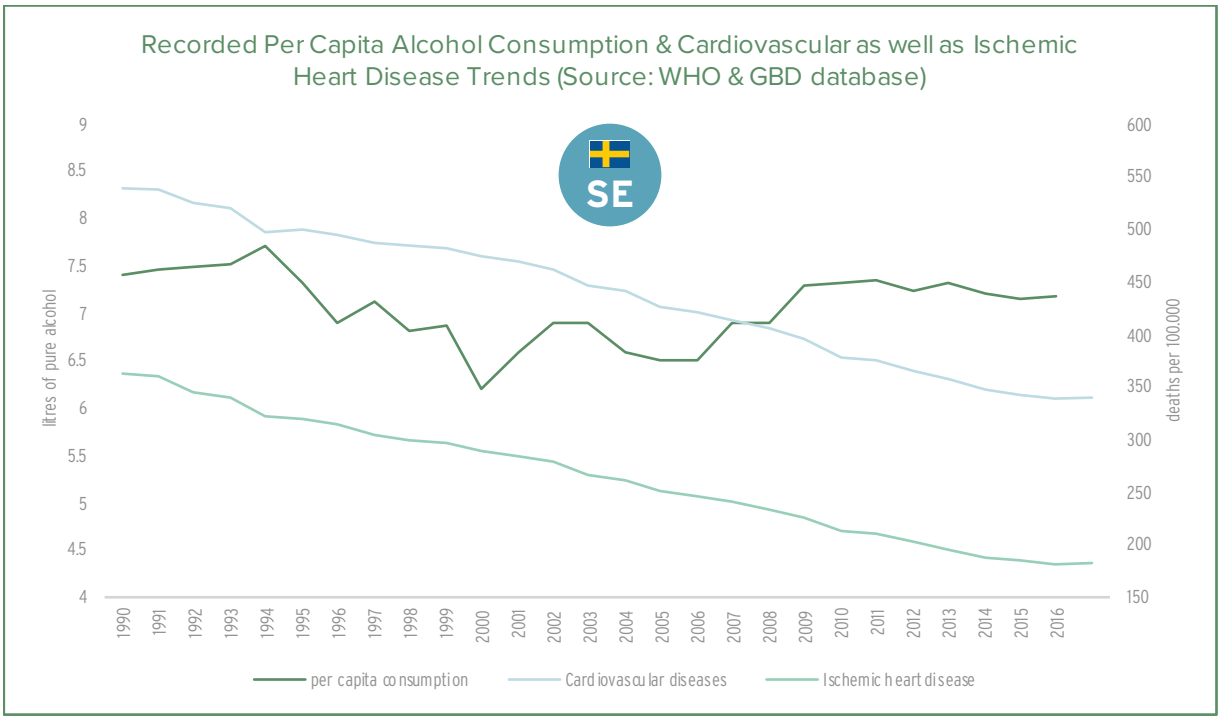
In this chapter, we draw on the Global Burden of Disease dataset (http://ghdx.healthdata.org/gbd-results-tool). The intention is to compare the per capita alcohol consumption trend to various alcohol-related disease trends in Sweden. Unfortunately, numbers for total per capita alcohol consumption are not available for a sufficiently long period to undertake time-lagged comparisons. The diseases selected in this section are cardiovascular disease & ischemic heart disease (the number 1 cause of death in developed countries), diabetes type 2, and alcohol-related cancer types: that is, breast cancer, liver cancer due to alcohol, lip and oral cavity cancer, oesophageal cancer, colon and rectum cancer as well as kidney cancer. Standardised death rates per 100.000 are available for the years 1990 to 2017.

MAIN FINDINGS

→ Recorded per capita alcohol consumption appears to be unrelated or weakly associated at best with all the alcohol-related diseases considered in this chapter, even if time lags for recorded per capita alcohol consumption (15 and 20 years) are introduced since cancer is a chronic disease, which takes time to develop.

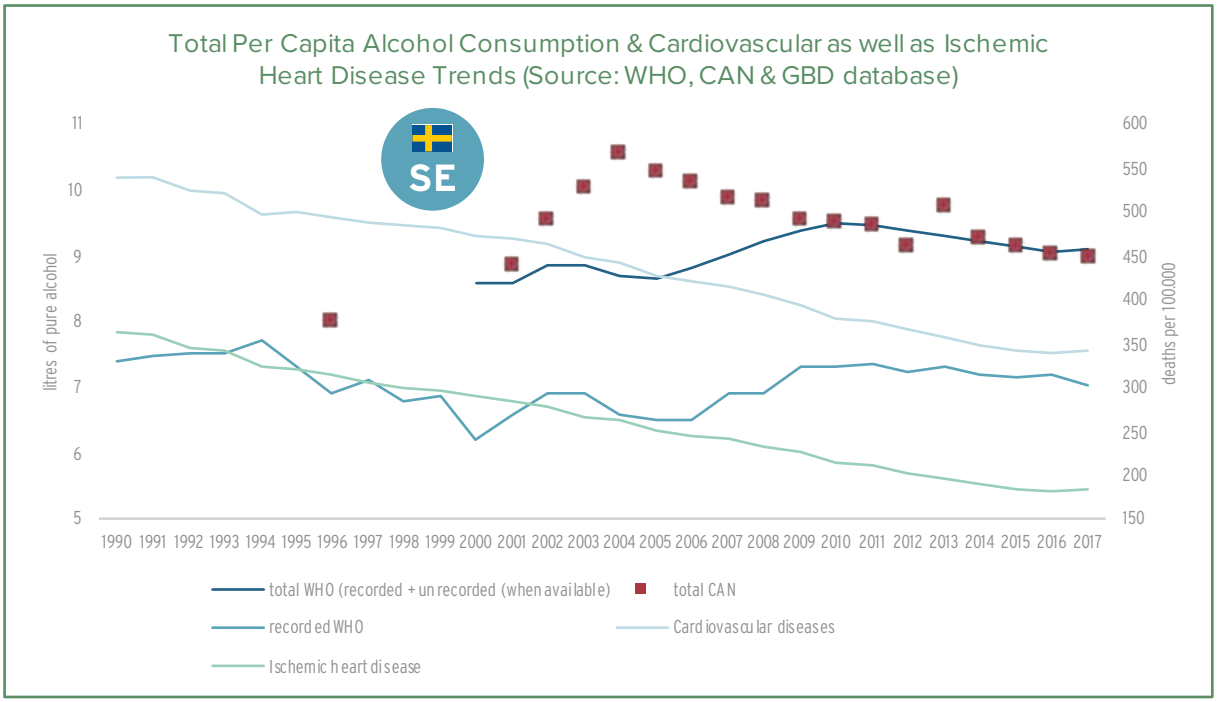
Most scientific evidence finds that light-to-moderate alcohol consumption is associated with a reduced risk to develop cardiovascular disease or ischemic heart disease. In other words, heavy drinkers and abstainers face a higher risk to develop those diseases. Per capita alcohol consumption captures only average consumption and does not say anything about the distribution of different types of drinkers. Nevertheless, it is used as a harm indicator, because the lower the level of per capita alcohol consumption, the lower alcohol-related harm, following the population-based theory. A declining trend for both cardiovascular and ischemic heart disease can be observed in Sweden, which coincided with a relatively stable trend in recorded per capita alcohol consumption, showing some increases and decreases (see figure 106).

Figure 106: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



Does total per capita alcohol consumption explain the declining trend in cardiovascular and ischemic heart disease deaths since 1990 in Sweden?

Figure 107: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)

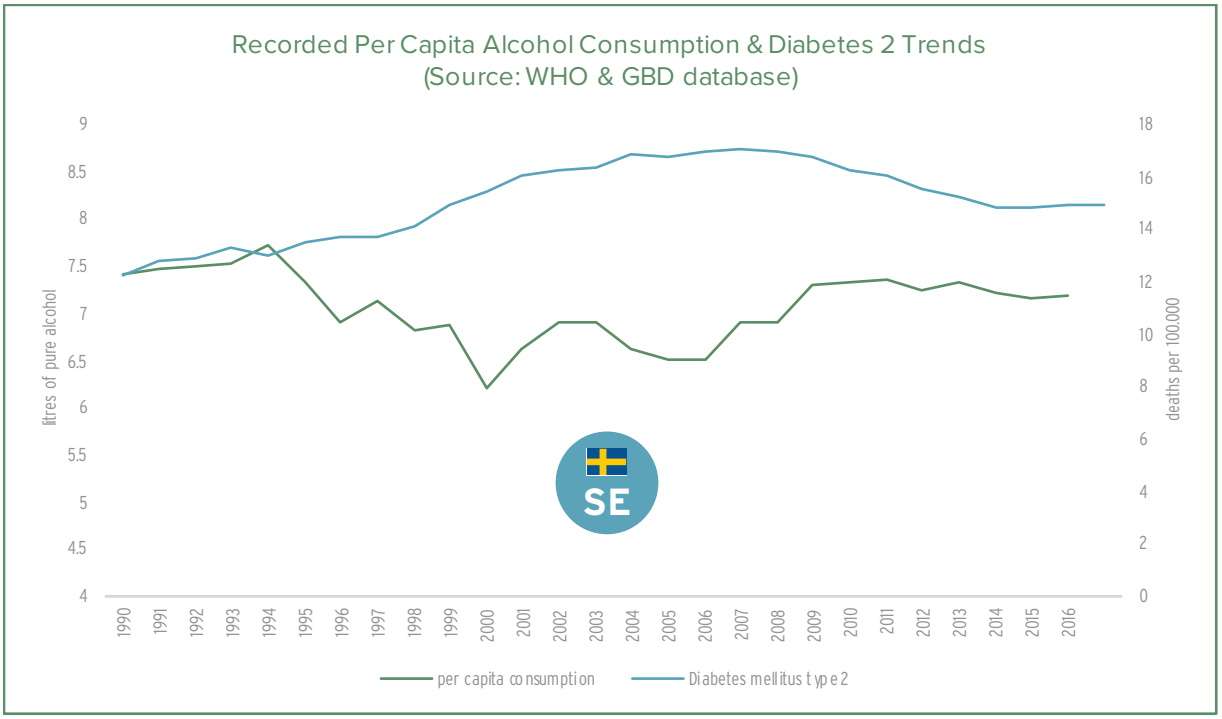


The inclusion of unrecorded and hence total per capita alcohol consumption, which increased at least between 1995 and 2004 (according to CAN data) or between 1995 and 2010 (according to WHO data), appears to have no impact on the diseases above: neither cardiovascular nor ischemic heart diseases increased but continued to decline, with no apparent difference to the years before 1995 and after 2004 or 2010.

It seems that the declining trend of cardiovascular and ischemic heart disease is relatively independent of the level & trend in recorded and total per capita alcohol consumption. Given these trends, it is not possible to infer that the higher per capita alcohol consumption, the lower those two diseases nor the other way around.

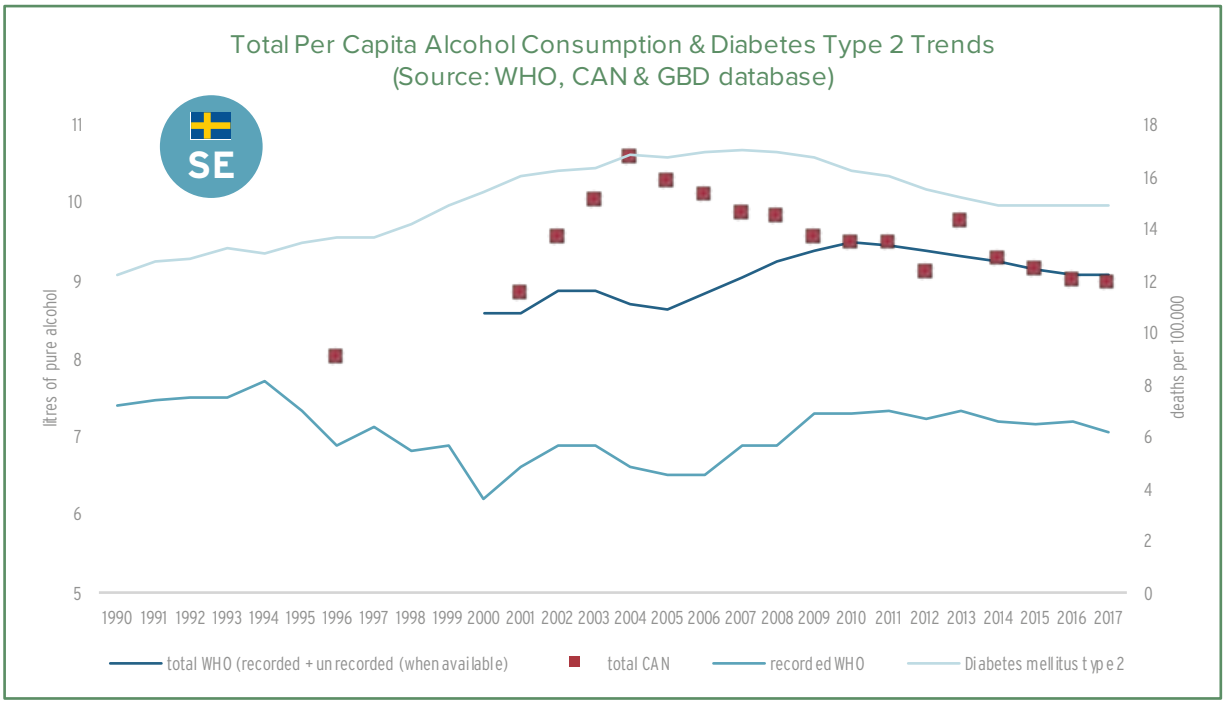
Scientific evidence suggests that light-to-moderate alcohol consumption reduces the risk to develop diabetes type 2. How is per capita alcohol consumption related to diabetes type 2 in Sweden (see figure 108 & 109)?

Figure 108: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



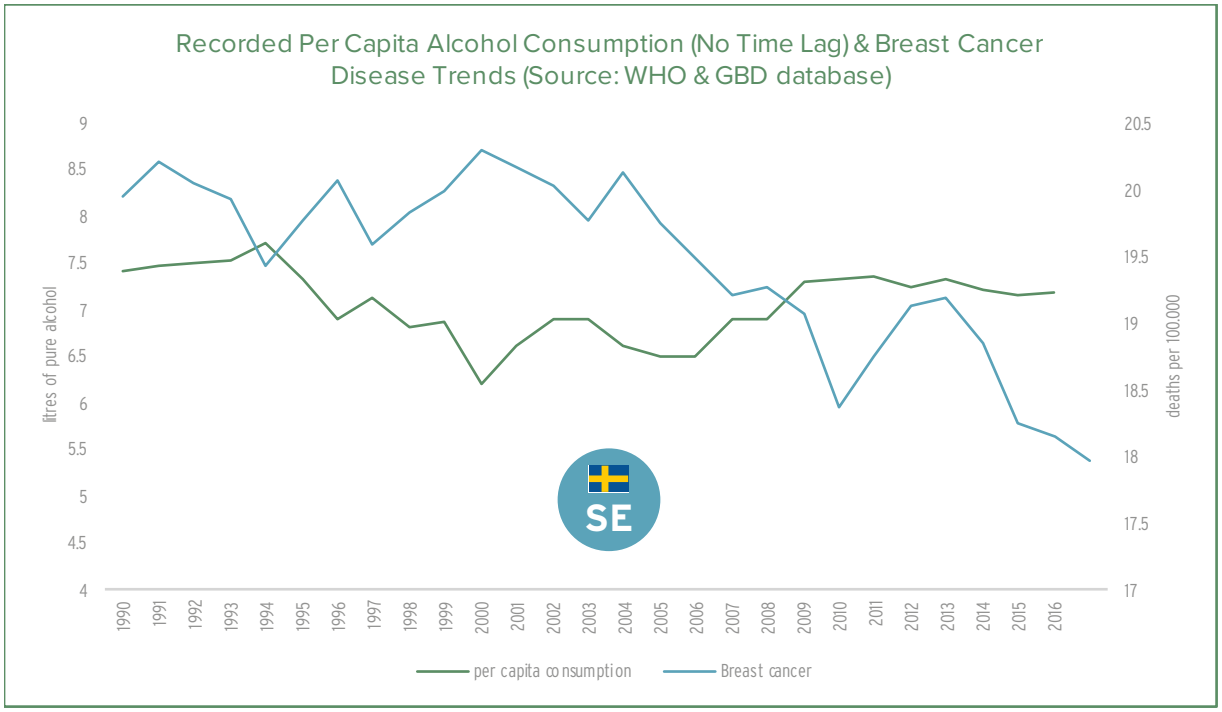
A relatively steady increase in diabetes type 2 can be observed between 1990 and 2008, followed by a decline until 2014. Since then, the rate remained relatively stable, though the level in 2017 is above the level in the year 1990. Recorded per capita alcohol consumption slightly decreased between 1990 and 2016, with some increases and decreases during the timespan. However, if unrecorded per capita alcohol consumption is taken into account, diabetes 2 death rate follows somehow the trend in total per capita alcohol consumption, at least, when referring to WHO data. If CAN data is compared to diabetes type 2 deaths, the link becomes less clear (see figure 109). A further and more sophisticated analysis needs to be undertaken.

Figure 109: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



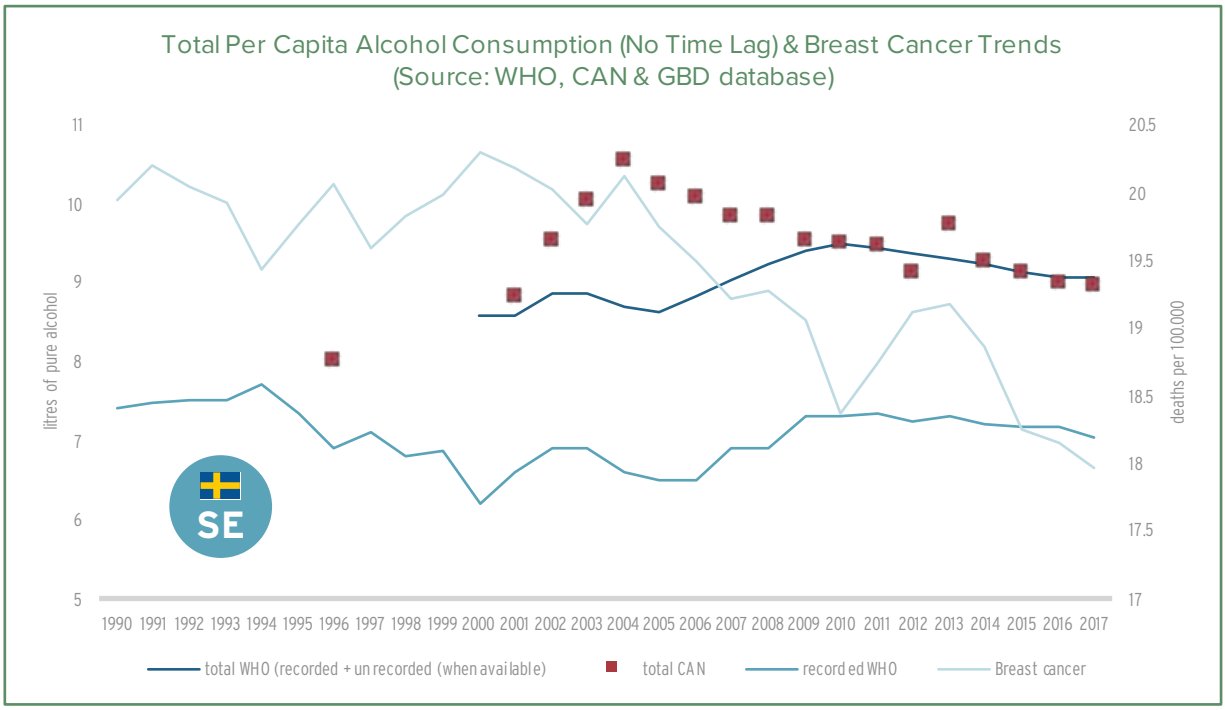
A look at figure 110 might suggest that a decline in recorded per capita alcohol consumption concurred with an increase in breast cancer deaths and an increase in recorded per capita alcohol consumption with a decline in breast cancer deaths, at least, for most time sequences.

Figure 110: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



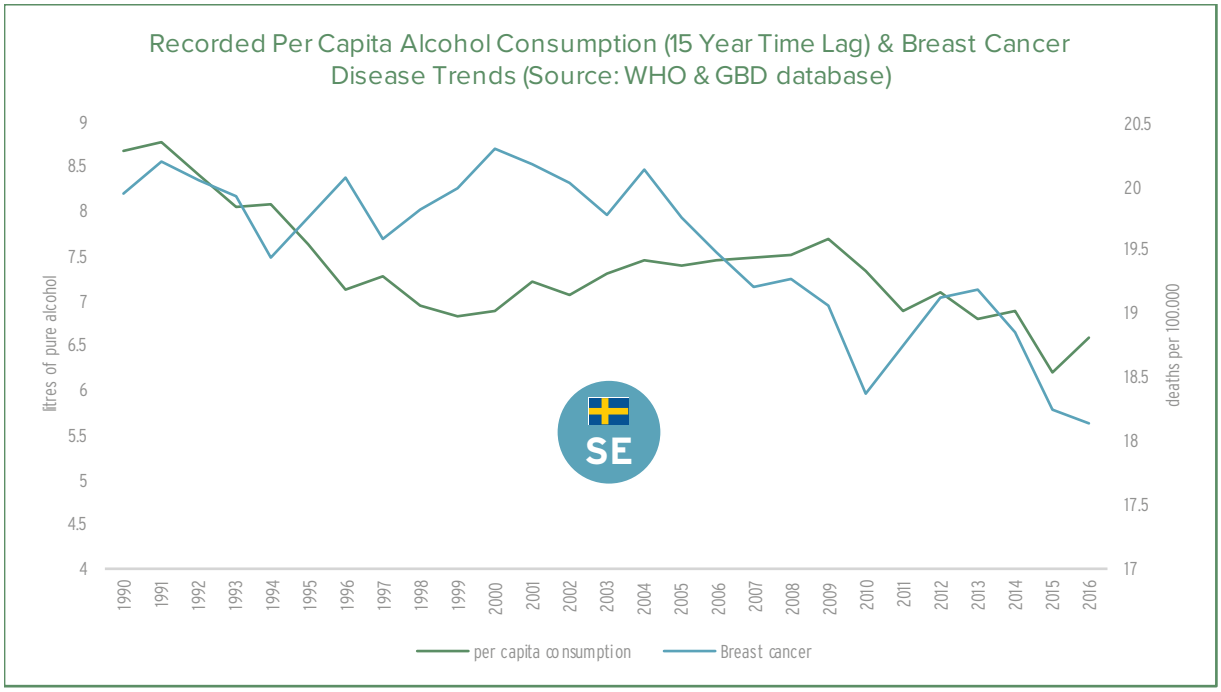
Also, total per capita alcohol consumption trends (whether referring to WHO or CAN data) do not really explain the trend in breast cancer deaths: during the increase in total per capita alcohol consumption after 1995, one can see increases but also decreases in breast cancer deaths (see figure 111). Perhaps a time lagged picture may better explain breast cancer deaths, since cancer is a disease that takes 15 to 20 years to develop. Unfortunately, longer-term data for unrecorded alcohol consumption is not available and hence no further details can be provided.

Figure 111: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



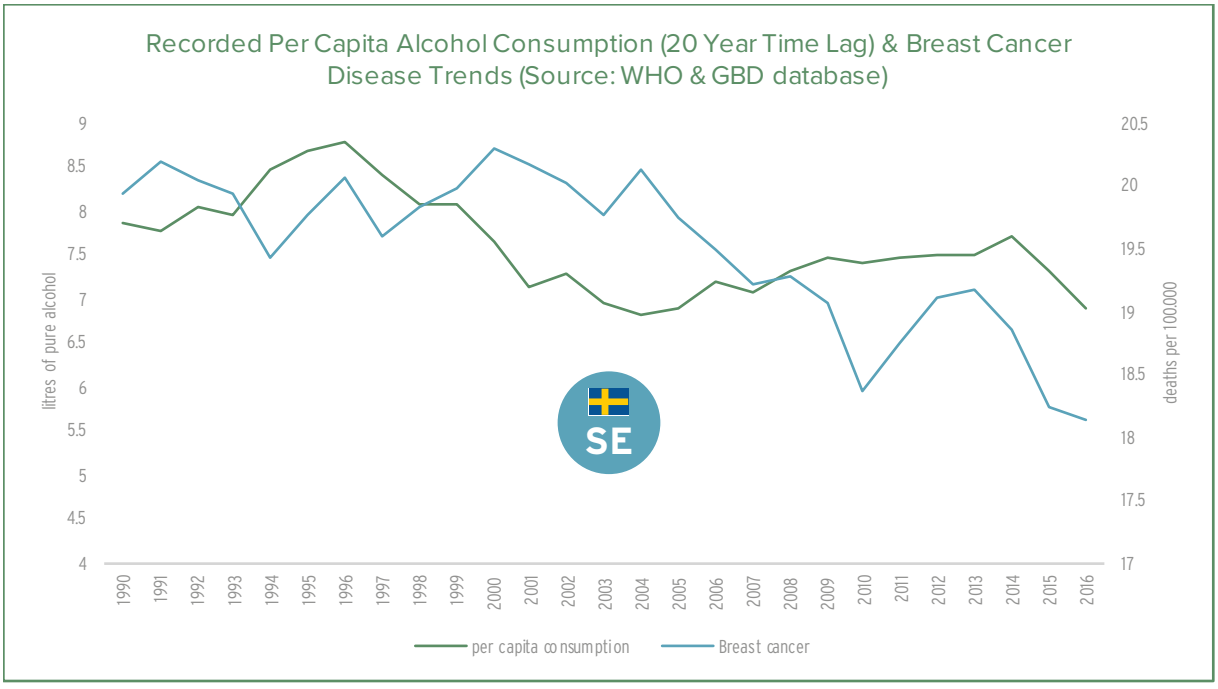
While a time lagged comparison cannot be done for total per capita alcohol consumption due to missing data, we can compare breast cancer deaths to recorded per capita alcohol consumption with a time lag of 15 years (recorded per capita consumption 1975-2001). There are at least some periods in the 1990s and 2000s, where per capita alcohol consumption and breast cancer follow the same direction (see figure 112).

Figure 112: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)



However, there are also periods with declining per capita alcohol consumption and increasing breast cancer deaths, which indicates that recorded per capita alcohol consumption with a 15-year time lag does not adequately explain trends in breast cancer deaths in Sweden. Perhaps a time lag of 20 years reveals that recorded per capita alcohol consumption is closely related to breast cancer trends? (see figure 113).

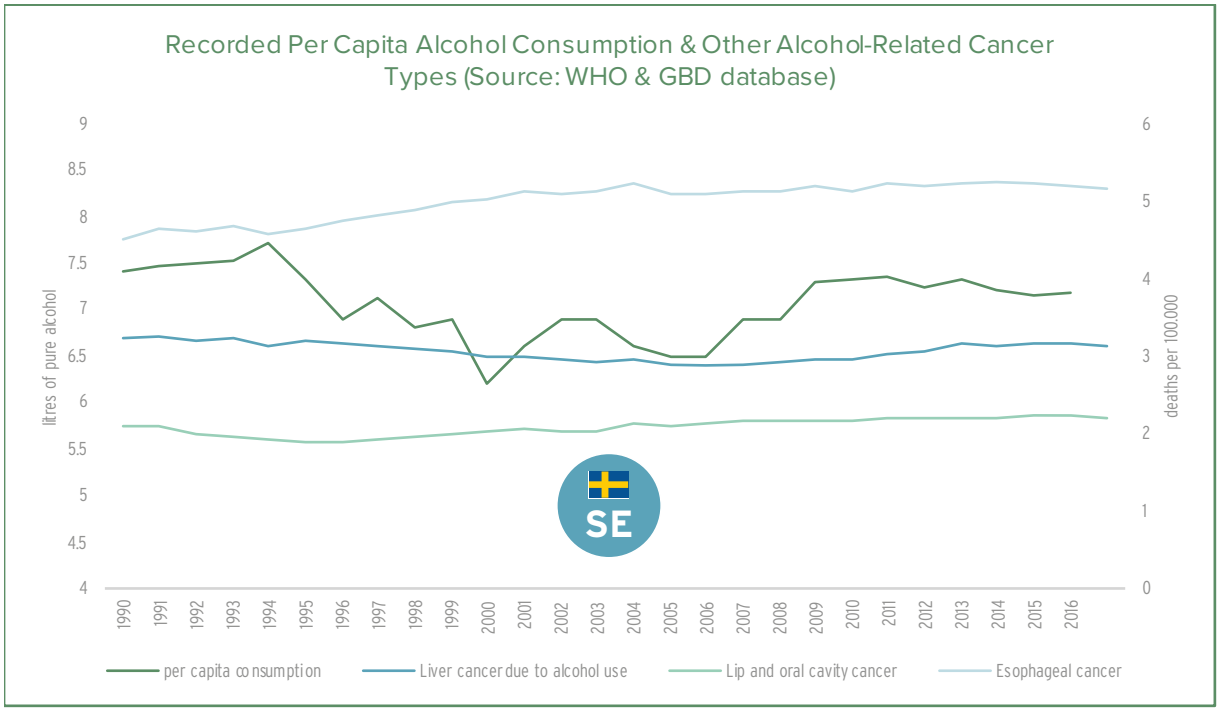
Figure 113: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)



With a 20-year time lag, we get close to the possibility that the per capita alcohol consumption trend can somehow explain the trend in breast cancer. However, breast cancer deaths increases between 1997 and 2001 coincide with a declining trend in recorded per capita alcohol consumption and the same is observed between 2001 and 2004. There are also some increases in breast cancer deaths that coincide with decreases in recorded per capita alcohol consumption. Overall, it seems that recorded per capita alcohol consumption is, at best, weakly associated with breast cancer, even when considering time-lags. A simple comparison of trends cannot answer the question whether or not there is a strong association between per capita alcohol consumption and breast cancer deaths.

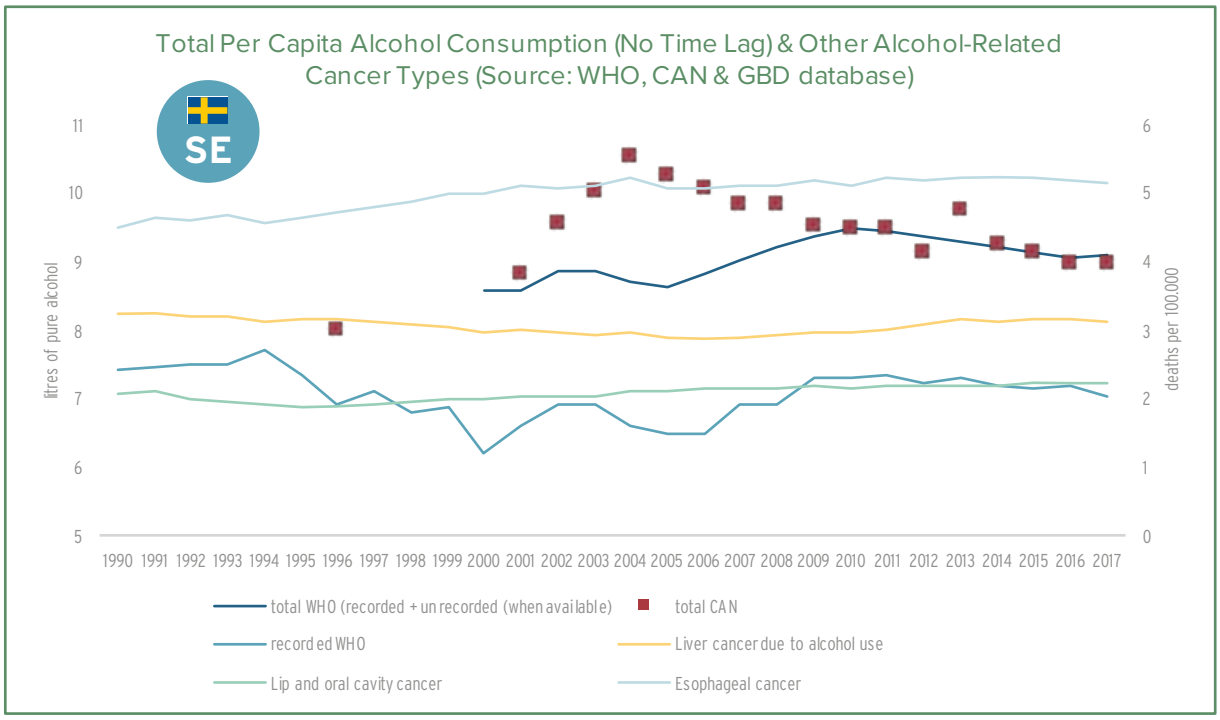
How about other alcohol-related cancer types? Figure 114 compares other cancer types to recorded per capita alcohol consumption.

Figure 114: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



The death rate for alcohol-related cancer types shown in figure 115 do not follow the trend in recorded per capita alcohol consumption. Maybe total per capita alcohol consumption will better explain the trends in alcohol-related other cancer types?

Figure 115: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



If other cancer types followed the trend in total per capita alcohol consumption, then, we should see increases between 1995 to 2004 (according to CAN data) or 1995 to 2010 (according to WHO data), followed by a declining trend. However, this cannot be observed in figure 115 and therefore total per capita alcohol consumption has no or little explanatory power at best.

A time lagged look is possible, if we use recorded per capita alcohol consumption (see figure 116 and 117).

Figure 116: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)

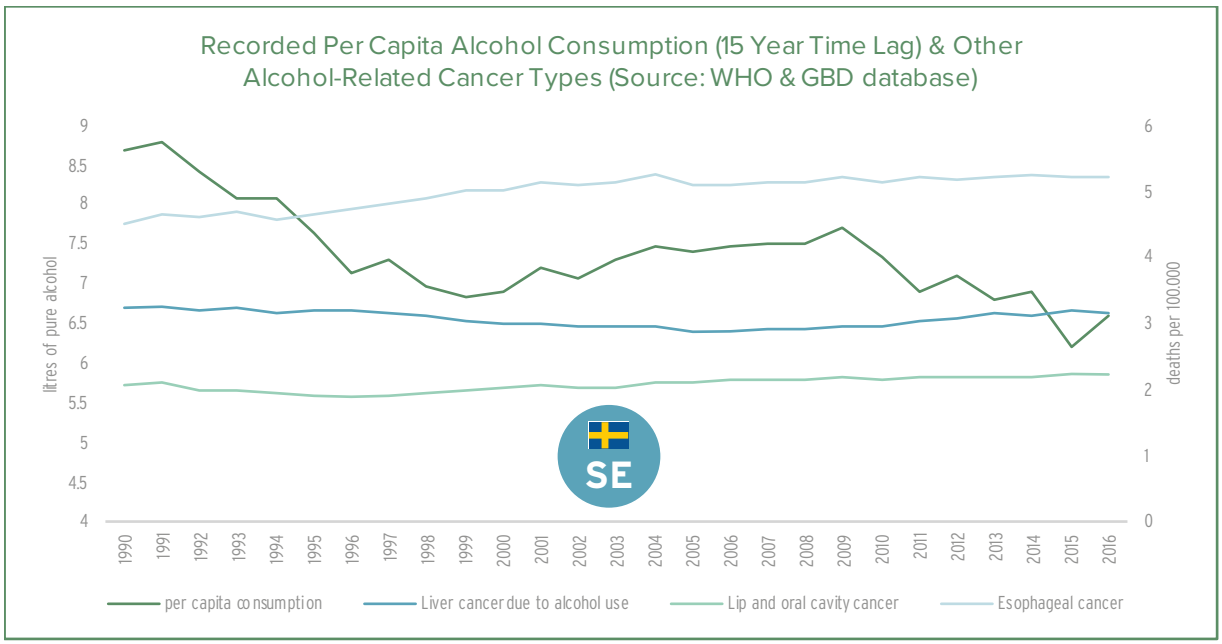
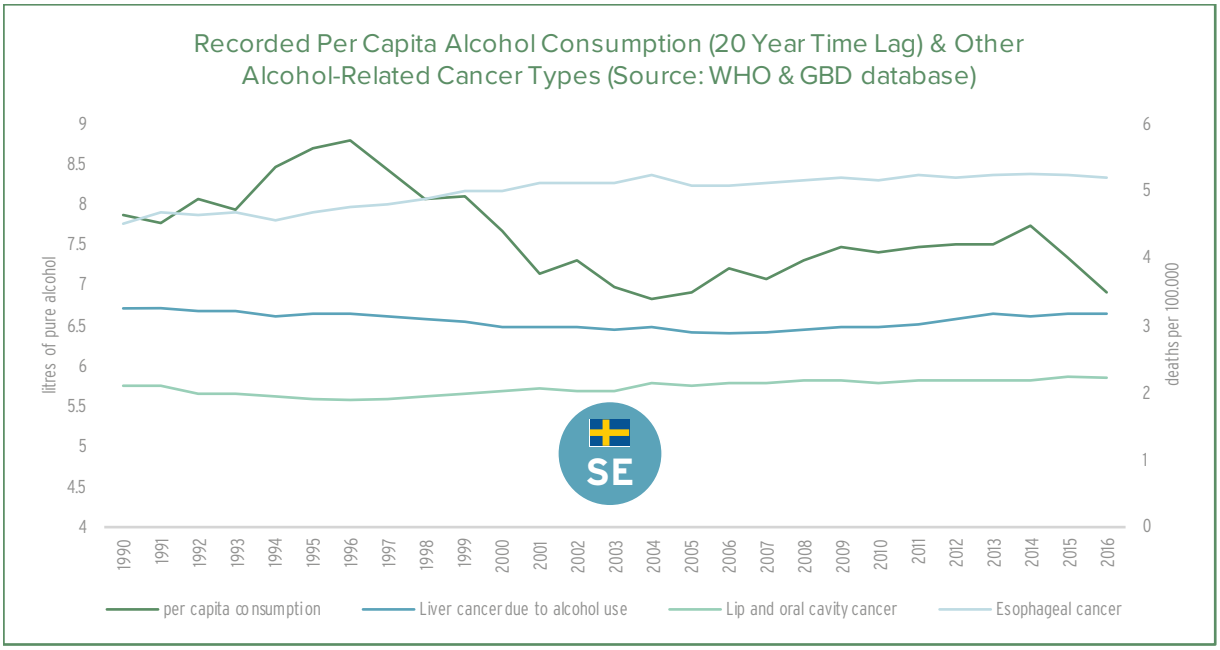


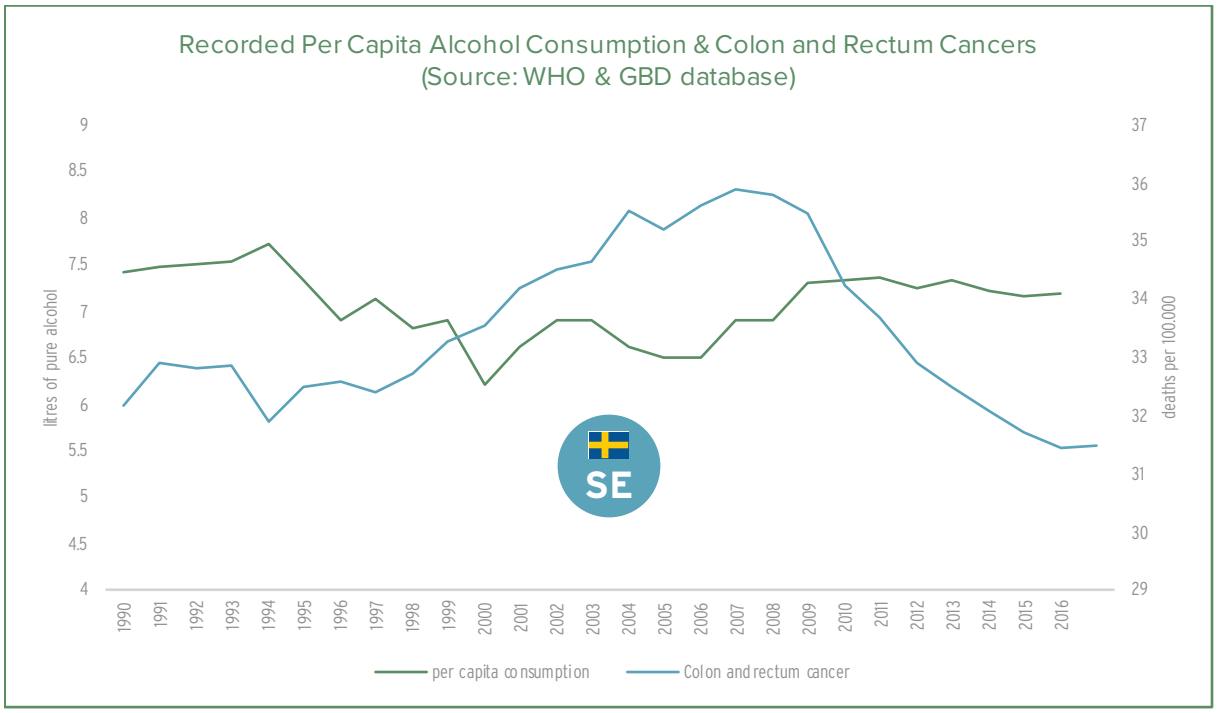
Figure 117: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool, time-lagged per capita alcohol consumption applied by the author)



Whether with or without time-lagged recorded per capita alcohol consumption trends, the latter does not explain the trends in alcohol-related cancer types above.

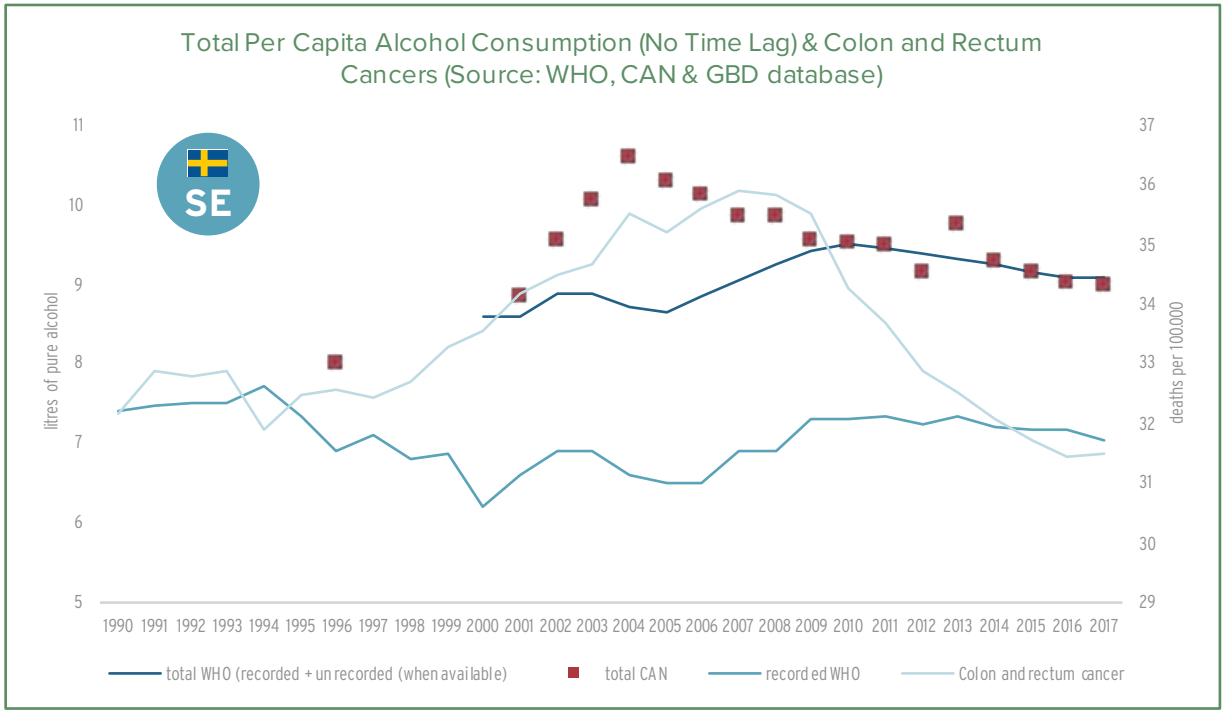
Figure 118 compares recorded per capita alcohol consumption to colon and rectum cancer deaths.

Figure 118: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



A sharp increase (though in fact minor since this is due to the zoom perspective) in colon and rectum cancer deaths between 1994 and 2007 is followed by a sharp decline after 2008. This trend does not coincide with the trend in recorded per capita alcohol consumption. However, it is closely associated to total per capita alcohol consumption (see figure 119).

Figure 119: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)



Colon and rectum cancers are not developed over night and hence a time lagged perspective appears to make more sense (see figure 120 & 121). Unfortunately, only data for recorded per capita alcohol consumption is available.

Figure 120: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)

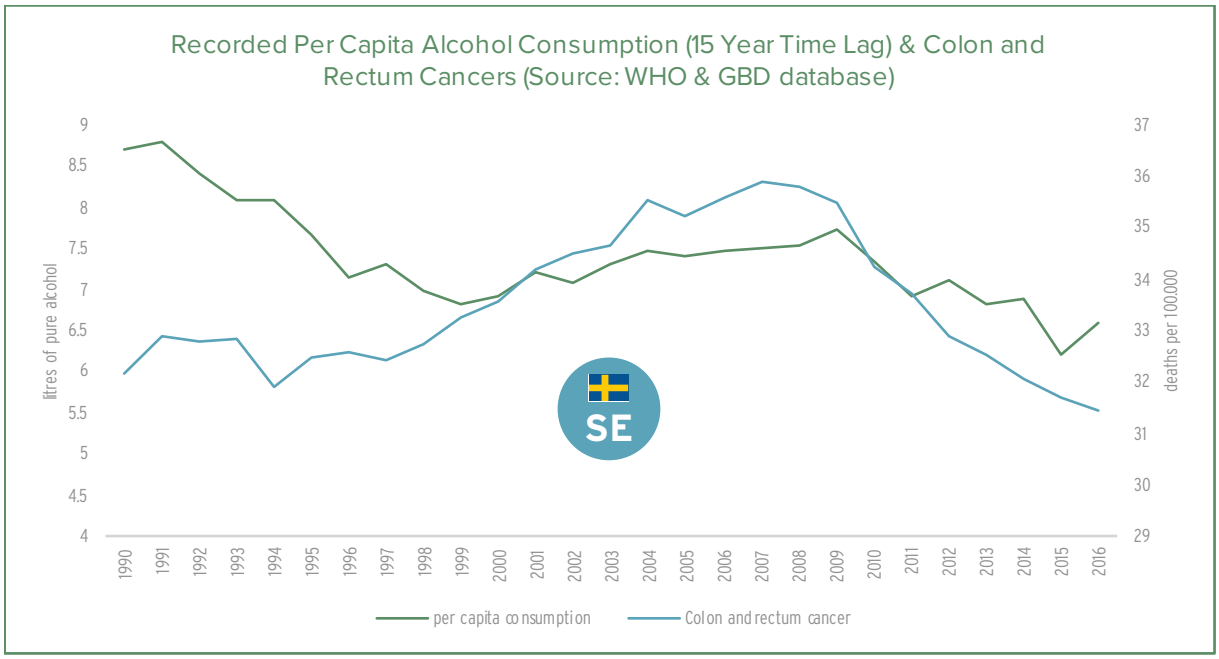
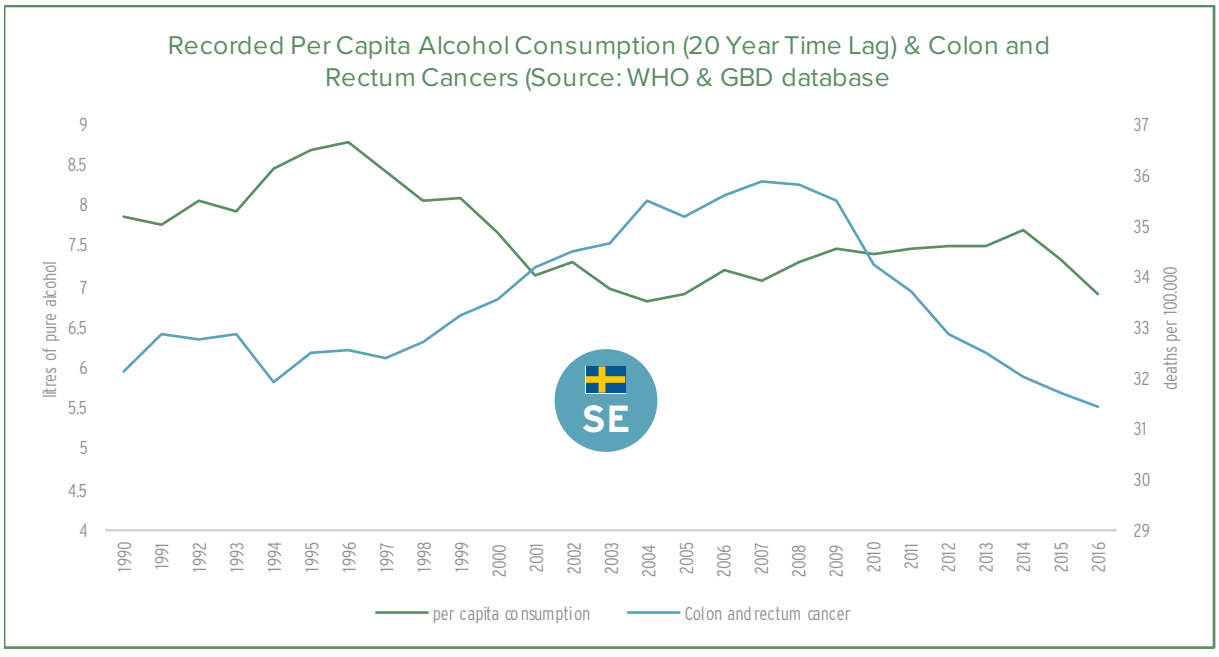


Figure 121: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)



Again, just looking at these trend charts does not suggest that recorded per capita alcohol consumption explains or is associated with colon and rectum cancer deaths in Sweden.

Finally, scientific evidence indicates that light-to-moderate alcohol consumption reduces the risk to develop kidney cancer. Whether a protective effect can be observed when comparing kidney cancer deaths to per capita alcohol consumption, which does not distinguish between different drinking patterns, is the question we intend to address with the following figures.

Figure 122 compares recorded per capita alcohol consumption to kidney cancer deaths. Interestingly, higher recorded per capita alcohol consumption levels coincide with lower kidney cancer death rates. This picture may change, if total per capita alcohol consumption is taken into account (see figure 123).

Figure 122: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool)

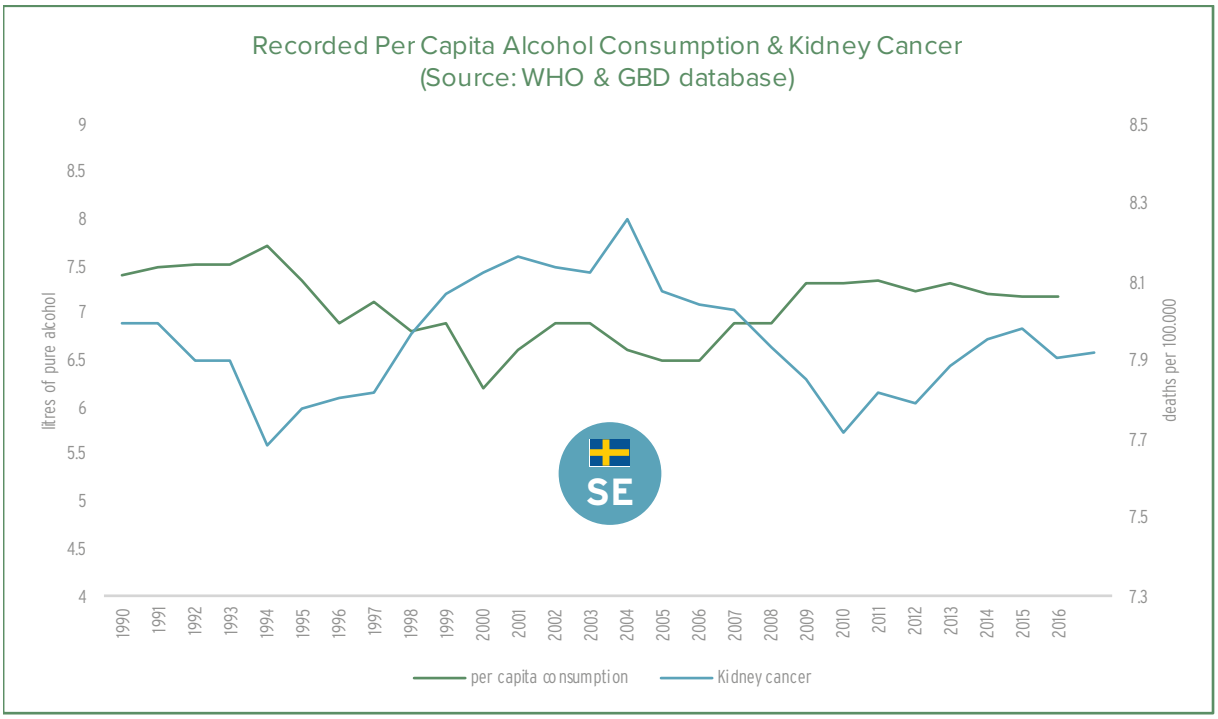


Figure 123: source (WHO – https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption & CAN – https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf & GBD data – http://ghdx.healthdata.org/gbd-results-tool)

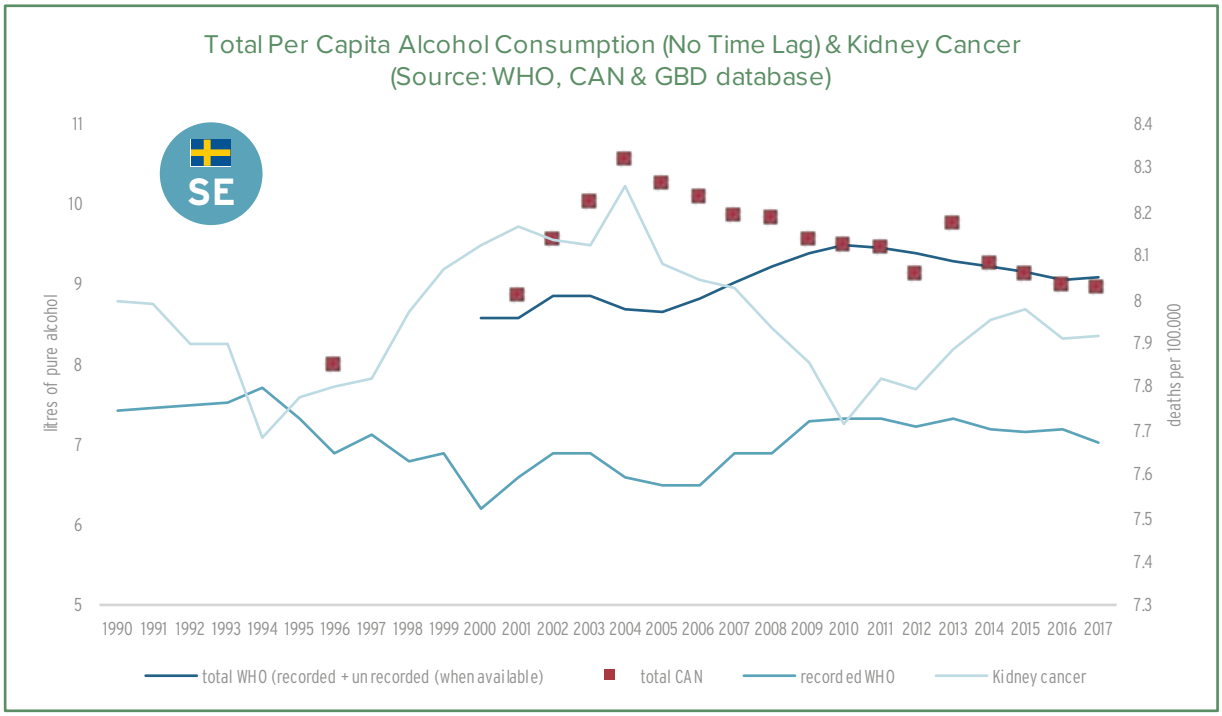


Figure 123 suggests that kidney cancer deaths follow the trend in total per capita alcohol consumption, for at least some years, but not in the last decade, nor from 1990 to 1994. In any case, a time lagged perspective might be more useful, since also kidney cancer does not develop overnight.

Figure 124 and 125 compare kidney cancer deaths to time lagged recorded per capita alcohol consumption.

Figure 124: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)

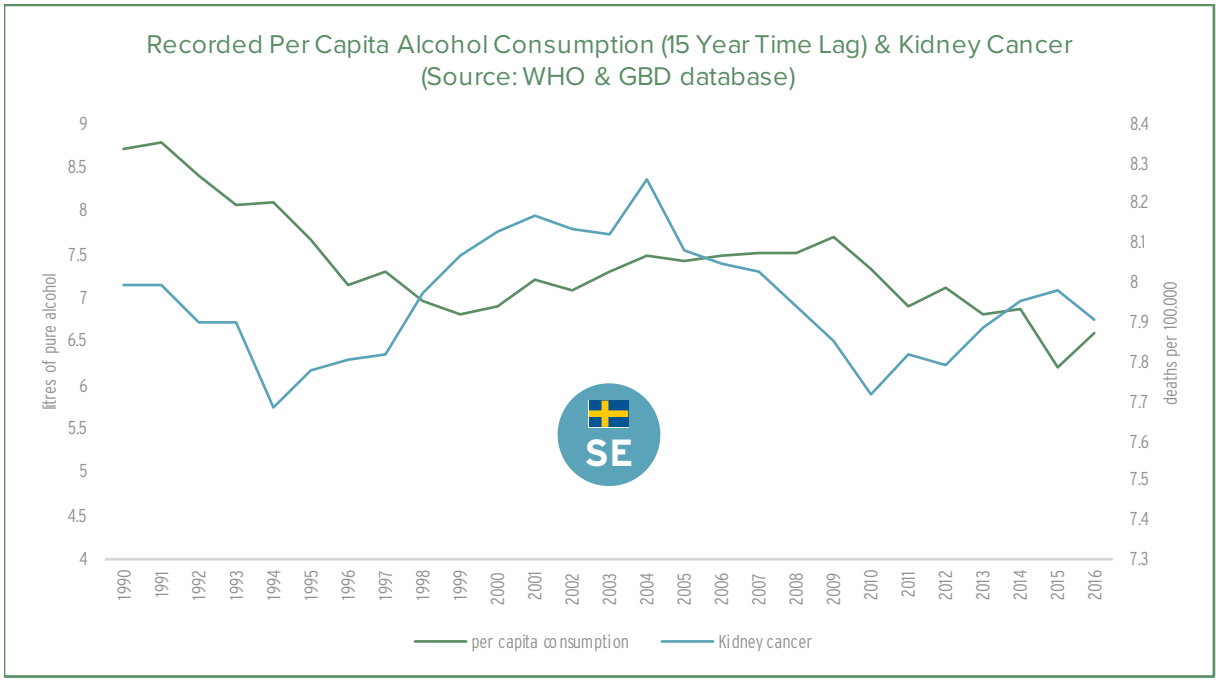
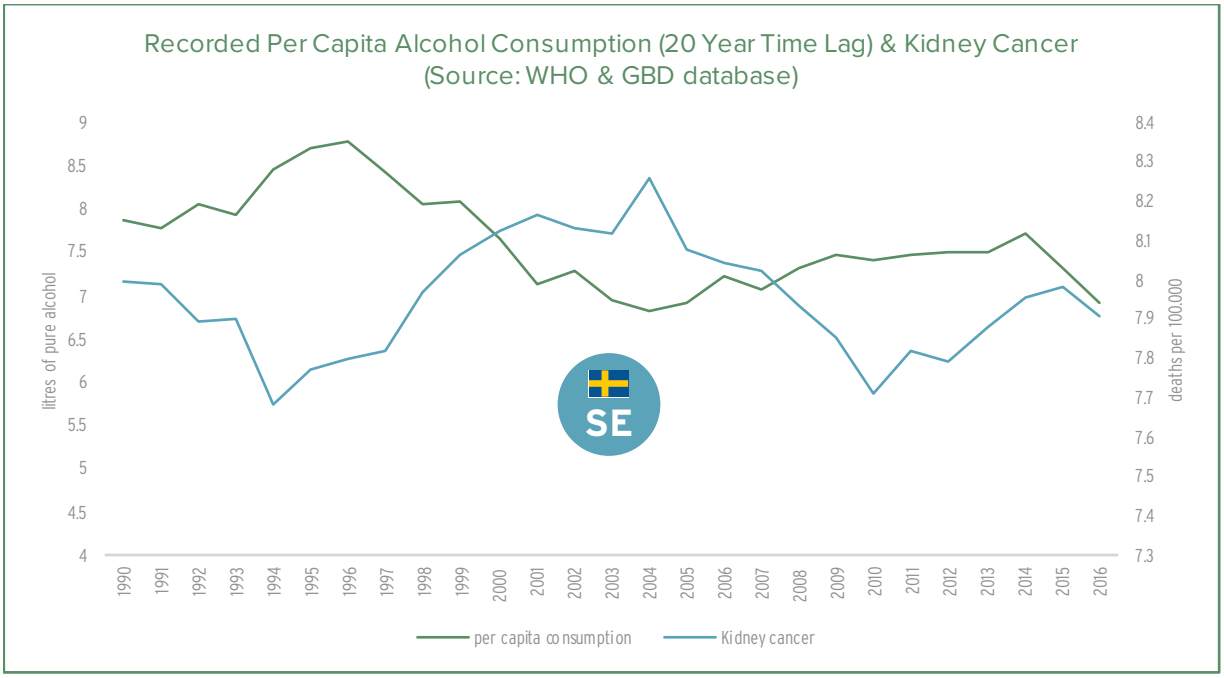


Figure 125: source (WHO – https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/levels-of-consumption & GBD data – http://ghdx.healthdata.org/gbd-results-tool), time-lagged per capita alcohol consumption applied by the author)



Also, for kidney cancer, no clear association can be observed with total and recorded per capita alcohol consumption. The simple comparison of trends in (total and recorded) per capita alcohol consumption and chronic diseases does not provide sufficient insight to determine whether these trends are associated to each other.

#11 Alcohol-Related Harm Data in Selected countries

In this chapter, some diseases from the Global Burden of Disease database are selected for Finland, Sweden and Norway (the Nordic countries) as well as for Greece, Italy and Malta (the Mediterranean countries). The comparison between chronic diseases and recorded per capita alcohol consumption in the selection of countries reveals no clear results, like the findings for Sweden in chapter 10.

MAIN FINDINGS

- Trends in the selected diseases are not homogeneous in all selected countries.
- No clear association can be observed between recorded per capita alcohol consumption and the following diseases in the selected countries:
  - Cardiovascular,
  - Ischemic heart,
  - Breast cancer,
  - Liver cancer, and
  - Colon & rectum cancer.

Figure 126 shows recorded per capita alcohol consumption trends for the selected countries for the same period as trends for the selected chronic diseases were available by the Global Burden of Disease database (figures 129 and following).

Figure 126: source (WHO – https://www.who.int/data)

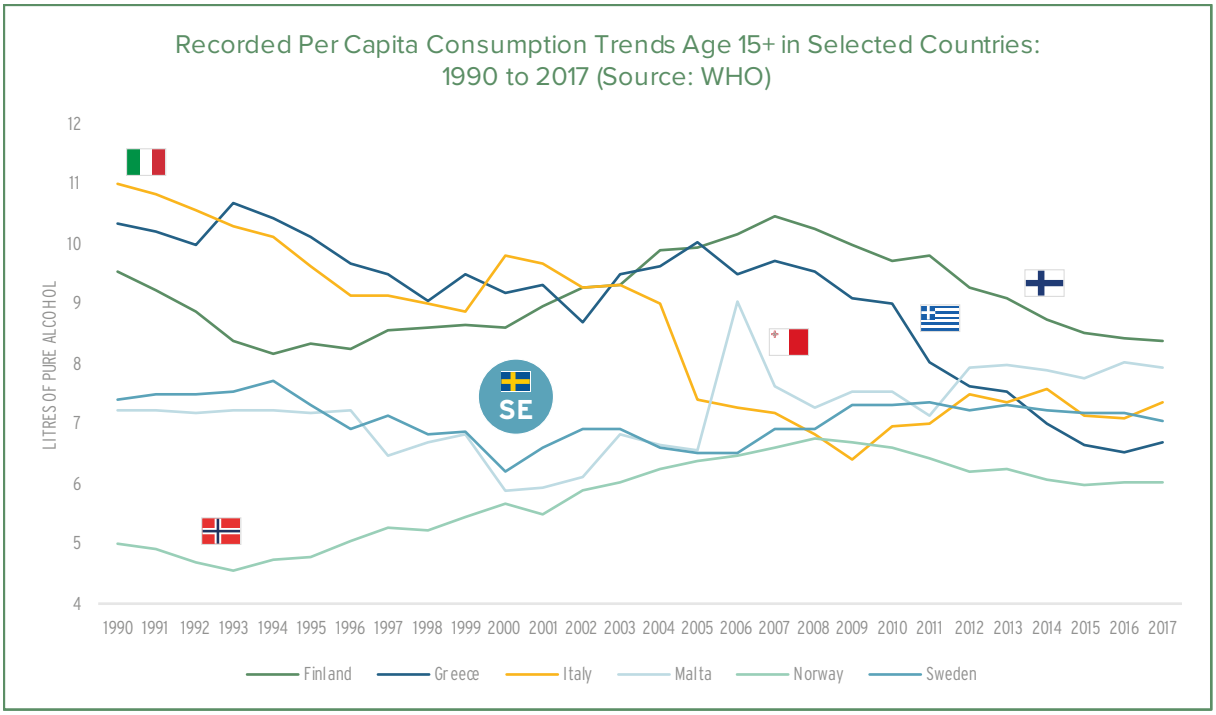


Figure 127 refers a to 15-year time lag in recorded per capita alcohol consumption for the selected countries, whereas figure 129 illustrates a 20-year time lag for recorded per capita alcohol consumption.

Figure 127: source (WHO – https://www.who.int/data)

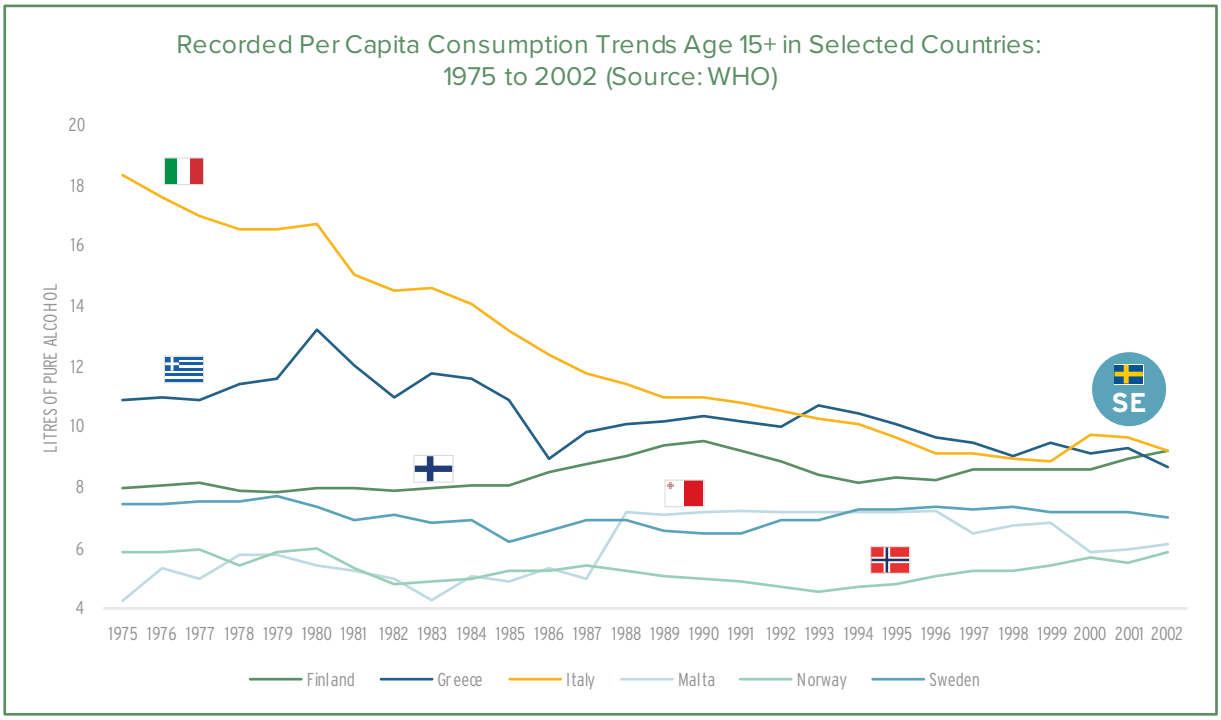
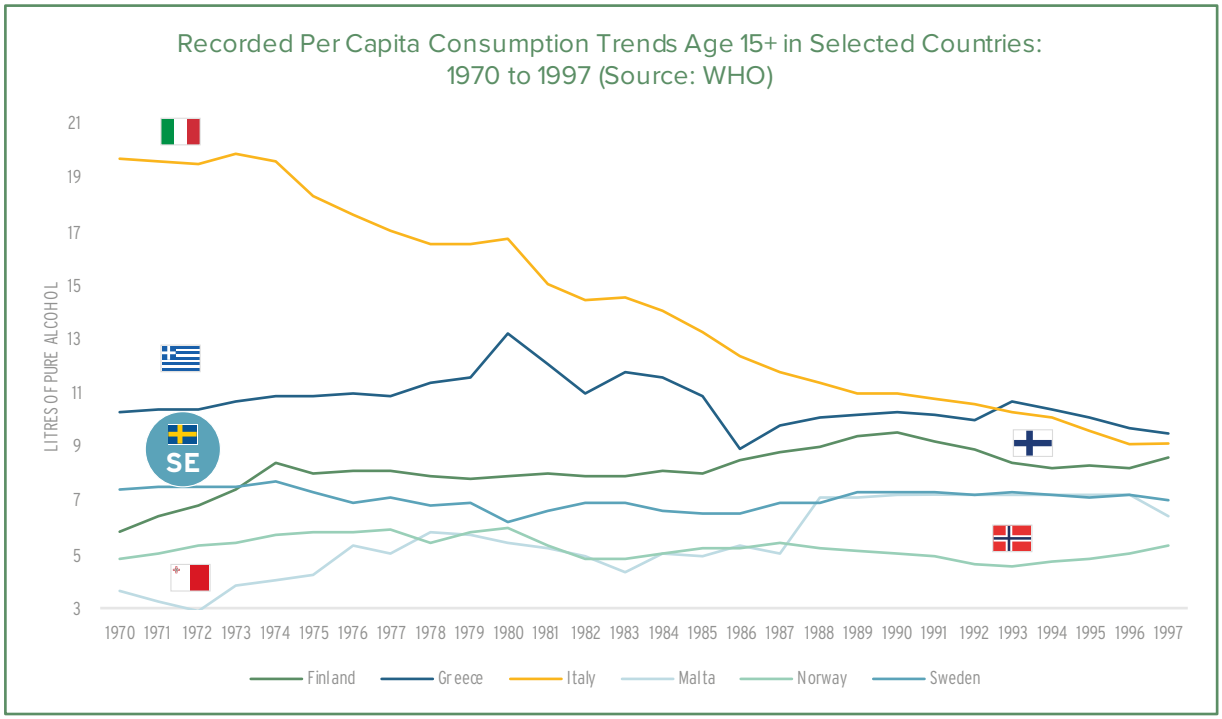
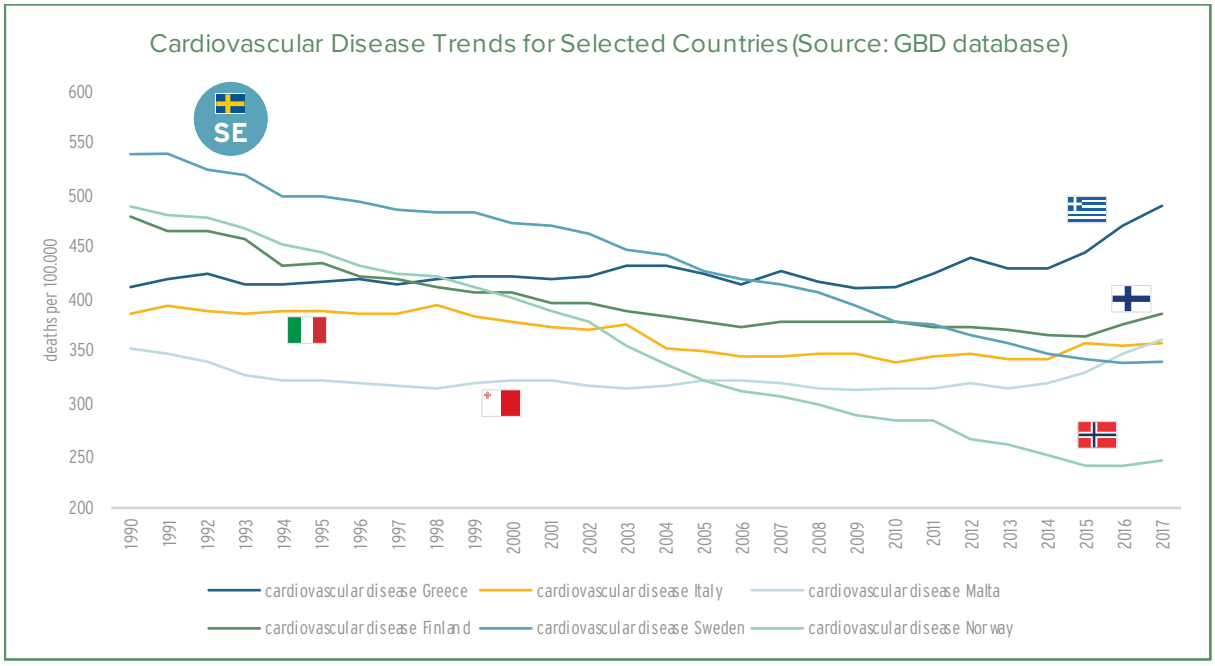


Figure 128: source (WHO – https://www.who.int/data)



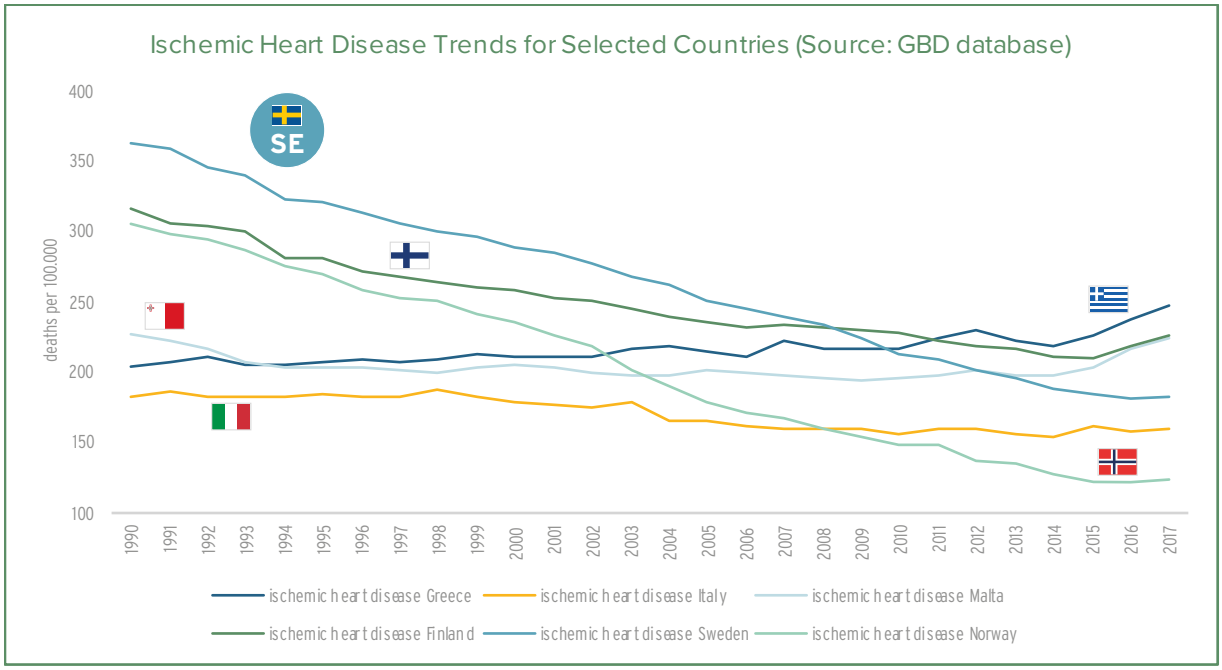
The sharpest decline in cardiovascular diseases can be observed for Sweden and Norway (see figure 129), which coincided with an increase in recorded per capita alcohol consumption at the same time. Time lagged recorded per capita alcohol consumption (15 and 20 years) for Sweden and Norway remained relatively stable. For Greece and Malta, a slight increasing trend in cardiovascular diseases can be observed, which coincided with a decrease in recorded per capita alcohol consumption in Greece and an increase in recorded per capita alcohol consumption in Malta at the same time. Time lagged recorded per capita alcohol consumption (15 and 20 years) slightly declined in Greece and increased in Malta.

Figure 129: source (GBD data – http://ghdx.healthdata.org/gbd-results-tool)



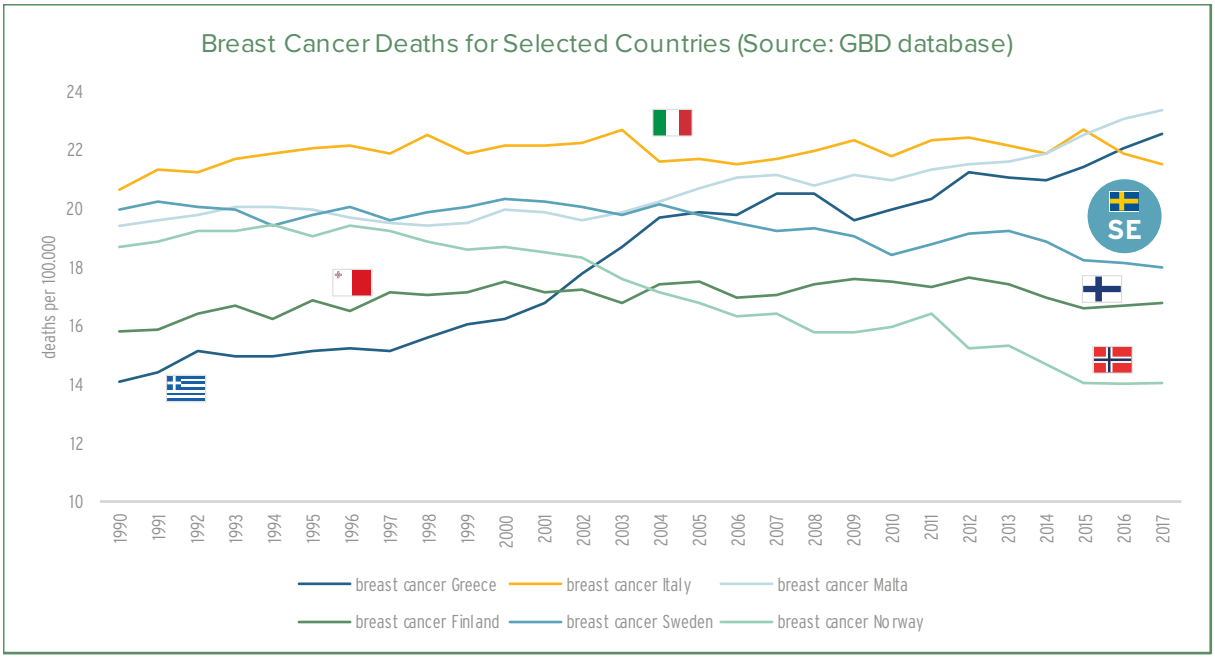
The sharpest decline in ischemic heart diseases can be observed for Sweden and Norway (see figure 130), which coincided with an increase in recorded per capita alcohol consumption at the same time. Time lagged recorded per capita alcohol consumption (15 and 20 years) for Sweden and Norway remained relatively stable. A slight increase in ischemic heart disease deaths can be observed for Greece and Malta, which coincided with a decrease in recorded per capita alcohol consumption in Greece and an increase in recorded per capita alcohol consumption in Malta at the same time. Time lagged recorded per capita alcohol consumption (15 and 20 years) slightly declined in Greece and increased in Malta.

Figure 130: source (GBD data – http://ghdx.healthdata.org/gbd-results-tool)



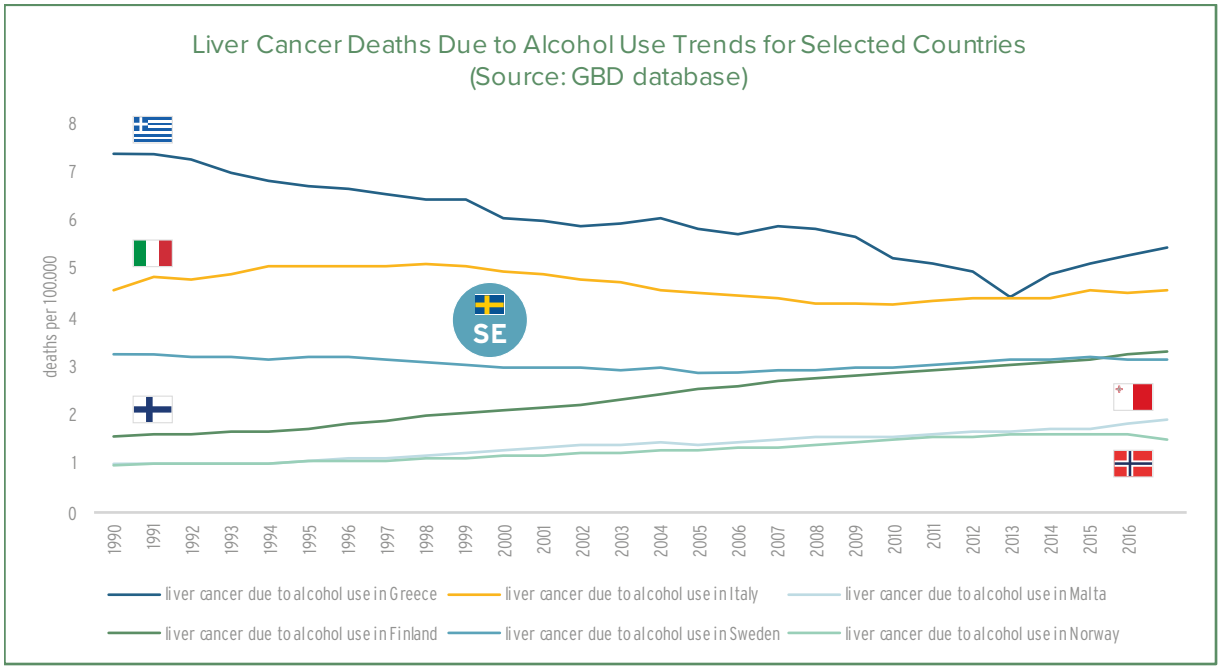
The sharpest increase in breast cancer deaths can be observed for Greece (see figure 131), which coincided with a decrease in recorded per capita alcohol consumption at the same time, but also time lagged recorded per capita alcohol consumption (15 and 20 years) declined. The sharpest decline in breast cancer deaths can be observed for Norway, which coincided with an increase in recorded per capita alcohol consumption at the same time, whereas time lagged recorded per capita alcohol consumption (15 and 20 years) remained relatively stable.

Figure 131: source (GBD data – http://ghdx.healthdata.org/gbd-results-tool)



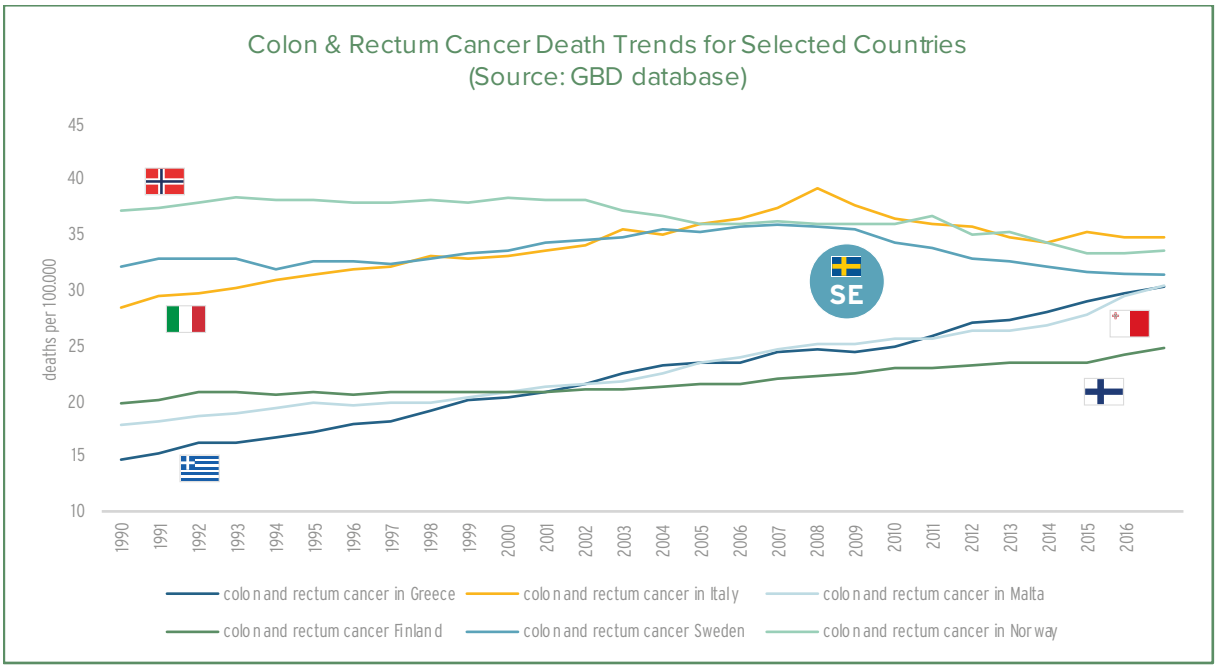
The sharpest decline in liver cancer deaths can be observed for Greece (see figure 132), which coincided with a decrease in recorded per capita alcohol consumption at the same time, but also time lagged recorded per capita alcohol consumption (15 and 20 years) declined. The sharpest increase in liver cancer deaths can be observed for Finland, which coincided with relatively stable and slightly declining trend (ups and downs) in recorded per capita alcohol consumption at the same time, while time lagged recorded per capita alcohol consumption (15 and 20 years) slightly increased.

Figure 132: source (GBD data – http://ghdx.healthdata.org/gbd-results-tool)



The sharpest increase in colon and rectum cancer deaths can be observed for Greece (see figure 133), which coincided with a decrease in recorded per capita alcohol consumption at the same time, but also time lagged recorded per capita alcohol consumption (15 and 20 years) declined. A similar but less strong increase in colon and rectum cancer deaths can be observed for Malta, which coincided with an increase in recorded per capita alcohol consumption in Malta at the same time. Time lagged recorded per capita alcohol consumption (15 and 20 years) also increased in Malta. A relatively stable and slightly declining trend in colon and rectum cancer deaths can be observed for Norway, which coincided with an increase in recorded per capita alcohol consumption at the same time, whereas time lagged recorded per capita alcohol consumption (15 and 20 years) remained relatively stable.

Figure 133: source (GBD data – http://ghdx.healthdata.org/gbd-results-tool)



Appendix: Data

The selection criteria for any data used in the analysis was completeness, which refers to data for the longest time series with the least amount of missing data for any specific year and data that contains as many EU+ countries as possible. Since the report aims to compare and contrast Nordic to Mediterranean countries, the objecitve was to use the same data source for each country, because different sources often report varying numbers due to methodological differences. Finally, the report mainly draws on publicly available data insead of buying data from private sources.

List of used data

Indicator	Specification	Source
Per capita alcohol consumption	▪ Recorded for people aged 15+ (1961-2019) split by beverage types ▪ Total (recorded & unrecorded) for people aged 15+ (2000-2019) ▪ Unrecorded for people aged 15+ (2005, 2010, 2016 & 2019)	WHO
Per capita alcohol consumption	▪ Recorded for people above the legal purchasing age (1994-2019)	The IWSR – drinks market analysis
Per capita alcohol consumption	▪ Recorded & unrecorded for people aged 15+ (1996, 2001-2019) for Sweden	CAN – Centralförbundet för alkohol- och narkotikaupplysning
Per capita alcohol consumption	▪ Unrecorded for people aged 15+ (1993-1996, 1998, 2000-2005) for Sweden ▪ Total for people aged 15+ (1976, 1989-1990, 1993, 1995-1996, 1998, 2000-2005) for Sweden	SoRAD – Centrum för socialvetenskaplig alkohol-och drogforskning
Per capita alcohol consumption	▪ Total, recorded and unrecorded for peoaple aged 15+ (1960-2019) for Finland	Finnish Institute for Health and Welfare
Drinking patters	▪ Survey assesing moderate, hazardous and heavy episodic drinkers in 2009	Special Eurobarometer (2010) EU citizens' attitudes towards alcohol. 331 / Wave 72.3
GDP per capita	▪ In constant & current local currency (1960-2019)	World Bank
Inflation – consumer prices (annual %)	▪ 1960-2019	World Bank
HICP – Harmonised Index for Consumer Prices (alcoholic beverages)	▪ Alcoholic beverages split by category (1996-2019)	Eurostat
Excise Duty Rates	▪ For alcoholic beverage types (1995-2020)	DG TAXUD
Excise Revenues	▪ For different alcoholic beverage types (1995-2019)	DG TAXUD
Heavy Episodic Drinking	▪ Population 15+, in the last 30 days (2010 & 2016)	WHO
Heavy Episodic Drinking	▪ Population 15+ in the last 30 days (2014 & 2019)	Eurostat
Life expectancy at birth	▪ Total – males & females together (1960-2018)	World Bank
Drink-driving deaths	▪ 2001-2018	ETSC – European Transport and Safety Council
Underage drinking patterns	▪ For 11, 13 and 15 year olds (2002, 2006, 2010 & 2014)	HBSC – Health Behaviour in School-Aged Children surveys
Underage drinking patterns	▪ For 15-16 year olds (1995, 1999, 2003, 2007, 2011, 2015 & 2019)	ESPAD – European School Survey Project on Alcohol and Other Drugs surveys
Chronic alcohol-related diseases	▪ Total – males & females together (1990-2017)	Global Burden of Disease Database

Further details for selected data directly cited from the source

Total per capita alcohol consumption (WHO)

Definition

Total alcohol per capita consumption (APC) is defined as the total (sum of recorded and unrecorded alcohol) amount of alcohol consumed per person (15 years of age or older) over a calendar year, in litres of pure alcohol, adjusted for tourist consumption. The estimates for total alcohol consumption are produced by summing up the 3-year average per capita (15+) recorded alcohol consumption and an estimate of per capita (15+) unrecorded alcohol consumption for a calendar year. Tourist consumption takes into account tourists visiting the country and inhabitants visiting other countries.

Method of measurement

Recorded alcohol consumption refers to alcohol consumed according to the official statistics at country level based on production, import, export, and sales or taxation data. When government national statistics are not available, country-specific alcohol industry statistics in the public domain based on interviews or fieldwork are used; otherwise, data from the Food and Agriculture Organization of the United Nations' statistical database (FAOSTAT) are used, or data from alcohol industry statistics in the public domain based on desk review. Unrecorded alcohol consumption refers to alcohol which is not taxed and is outside the usual system of governmental control, such as home or informally produced alcohol (legal or illegal), smuggled alcohol, surrogate alcohol (which is alcohol not intended for human consumption), or alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction). When nationally representative empirical data (which are often general population surveys in countries where alcohol is legal) are not available, specific other empirical investigations, or expert opinion supported by periodic surveys of experts at country level using modified Delphi-technique, are used. The litres of alcohol consumed by tourists (15 years of age or older) in a country are based on the number of tourists who visited a country, the average amount of time they spent in the country, and how much these people drink on average in their countries of origin (estimated based on per capita consumption of recorded and unrecorded alcohol). Furthermore, tourist alcohol consumption also accounts for the inhabitants of a country consuming alcohol while visiting other countries (based on the average time spent outside of their country (for all people 15 years or older) and the amount of alcohol consumed in their country of origin). These estimations assume the following: (1) that people drink the same amounts of alcohol when they are tourists as they do in their home countries, and (2) that global tourist consumption is equal to 0 (and thus tourist consumption can be either net negative or positive).Tourist consumption is based on UN statistics, and data are provided by IHME.

Method of estimation

The total APC in 2016 was calculated from a three-year average of recorded (for 2015, 2016, and 2017) per capita consumption and applying unrecorded proportion (for 2016) and tourist consumption (for 2016). For recorded alcohol consumption, if data did not already exist for 2015, 2016 and/or 2017, the relevant years were projected using a linear regression model employing recorded alcohol per capita consumption data since 2012. Unrecorded alcohol consumption was estimated as a percentage of total alcohol consumption. Country-level proportions of unrecorded alcohol consumption were estimated using a regression analysis. Fractional response random intercepts regression models which accounted for clustering of data points within countries were used to estimate what percentage of total alcohol consumption was due to unrecorded alcohol consumption. Univariate models were fitted for alcohol consumption statistics (the prevalence of drinking, recorded litres of alcohol consumed per capita per year, patterns of drinking scores, value added and excise taxation of alcoholic beverages, presence of

a written national alcohol policy, presence of national legislation to prevent illegal production and/or the sale of home or informally produced alcoholic beverages, and alcohol prohibition measures) and other predictors (urbanization, migration rates, malnutrition, sanitation, education levels, and per capita gross domestic product adjusted for purchasing power parity). Backward and forward selection (using a significance cut-off level of 0.2) was used in combination with out-of-sample predictions (multiple random 10% sub-samples) and plausibility checks to assess model fit. Covariate data for 2016 were obtained from the Institute for Health Metrics and Evaluation and the World Bank. Tourist consumption of alcohol are the litres of pure alcohol which are purchased and consumed by tourists in a country. This figure is adjusted for the alcohol purchased and consumed when people are visiting countries other than their home country. Positive figures denote total alcohol consumption of outbound tourists being greater than total alcohol consumption by inbound tourists, negative numbers the opposite.

Rationale

The total alcohol per capita consumption (APC) comprises both the recorded and the unrecorded APC, which together provides a more accurate estimate of the level of alcohol consumption in a country, and as a result, portrays trends of alcohol consumption in the adult population (15 years of age and older) in a more precise way. Drinking alcohol can be associated with developing alcohol use disorder or dependence and higher risk of mental and behavioural disorders. It is a major risk for liver cirrhosis, some cancers and cardiovascular diseases as well as injuries resulting from violence and accidents. Beyond health consequences, the harmful use of alcohol brings significant social and economic losses to individuals, their families and society at large.

Recorded per capita alcohol consumption (WHO)

Definition

Recorded APC is defined as the recorded amount of alcohol consumed per capita (15+ years) over a calendar year in a country, in litres of pure alcohol. The indicator only takes into account the consumption which is recorded from production, import, export, and sales data often via taxation. Numerator: The amount of recorded alcohol consumed per capita (15+ years) during a calendar year, in litres of pure alcohol. Denominator: Midyear resident population (15+ years) for the same calendar year, UN World Population Prospects, medium variant.

Method of measurement

Recorded alcohol per capita (15+) consumption of pure alcohol is calculated as the sum of beverage-specific alcohol consumption of pure alcohol (beer, wine, spirits, other) from different sources: the first priority in the decision tree is given to government statistics; second are country-specific alcohol industry statistics in the public domain based on interviews or field work (Global Data (formerly Canadean), IWSR-International Wine and Spirit Research, Wine Institute, historically World Drink Trends), or data from the International Organisation of Vine and Wine (OIV); third is the Food and Agriculture Organization of the United Nations' statistical database (FAOSTAT); and fourth is data from alcohol industry statistics in the public domain based on desk review. For countries, where the data source is FAOSTAT the unrecorded consumption may be included in the recorded consumption. As from the introduction of the "Other" beverage-specific category, beer includes malt beers, wine includes wine made from grapes, spirits include all distilled beverages, and other includes one or several other alcoholic beverages, such as fermented beverages made from sorghum, maize, millet, rice, or cider, fruit wine, fortified wine.

Method of estimation

Recorded alcohol per capita (15+) consumption of pure alcohol is calculated as the sum of beverage-specific alcohol consumption of pure alcohol (beer, wine, spirits, other). In order to make the conversion into litres of pure alcohol, if beverage volumes are not available in litres of pure alcohol, the alcohol content (% alcohol by volume) is considered to be as follows: Beer (barley beer 5%), Wine (grape wine 12%; must of grape 9%, vermouth 16%), Spirits (distilled spirits 40%; spirit-like 30%), and Other (sorghum, millet, maize beers 5%; cider 5%; fortified wine 17% and 18%; fermented wheat and fermented rice 9%; other fermented beverages 9%).

Heavy Episodic Drinking (WHO)

Rationale

Heavy episodic drinking is part of the key indicators which provide information regarding the patterns of alcohol consumption in a given country. More specifically, it identifies the proportion of the population which consumes high levels of alcohol at single occasions, and consequently highlights the population which particularly has a higher risk of experiencing alcohol-related acute harm but also developing chronic health complications.

Definition

Heavy episodic drinking is defined as the proportion of adults (15+ years) who have had at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days. A consumption of 60 grams of pure alcohol corresponds approximately to 6 standard alcoholic drinks. Numerator: The (appropriately weighted) number of respondents (15+ years) who reported drinking 60 grams or more of pure alcohol on at least one occasion in the past 30 days. Denominator: The total number of participants (15+ years) responding to the corresponding question(s) in the survey plus abstainers.

Unrecorded per capita alcohol consumption (WHO)

Rationale

Alcohol consumption can be recorded through production, export, import, and sales/taxation data. However, alcohol can also be produced and consumed outside of governmental control and remain unrecorded. In some cases, unrecorded APC represents an important proportion of a country's alcohol consumption, so it is vital to take this factor into account, in addition to recorded APC, when investigating a country's level of alcohol consumption.

Definition

Unrecorded APC is defined as the unrecorded amount of alcohol consumed per adult (15+ years) in litres of pure alcohol. Unrecorded consumption refers to alcohol which is not taxed and is outside the usual system of governmental control, such as home or informally produced alcohol (legal or illegal), smuggled alcohol, surrogate alcohol (which is alcohol not intended for human consumption), or alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction). Numerator: The amount of unrecorded alcohol consumed per adult (15+ years) during a calendar year, in litres of pure alcohol. Denominator: Midyear resident population (15+ years) for the same calendar year, UN World Population Prospects, medium variant. The three-year average of unrecorded APC is presented.

Method of measurement

The first priority in the decision tree is given to nationally representative empirical data; these are often general population surveys (e.g. STEPS survey). Second are specific empirical investigations, and third is expert opinion supported by periodic survey of experts at country level using modified Delphi-technique (nominal group technique).

Method of estimation

Unrecorded alcohol consumption in litres of pure alcohol is estimated as a percentage of total alcohol per capita consumption in the population 15 years of age and older. Country–level proportions of unrecorded alcohol consumption are estimated using a regression analysis. Fractional response random intercepts regression models which account for clustering of data points within countries are used to estimate what percentage of total alcohol consumption is due to unrecorded alcohol consumption. Univariate models are fitted for alcohol consumption statistics and other predictors (urbanization, migration rates, malnutrition, sanitation, education levels, and per capita gross domestic product adjusted for purchasing power parity), (see Probst C, Fleischmann A, Gmel G, Poznyak V, Rekve D, Riley L, Rylett M, Shield KD, Rehm J. The global proportion and volume of unrecorded alcohol in 2015. Journal of global health. 2019;9(1)).

Life expectancy at birth (World Bank)

Population estimates are usually based on national population censuses. Estimates for the years before and after the census are interpolations or extrapolations. Derived from total population. Population source: (1) United Nations Population Division. World Population Prospects: 2019 Revision, (2) Census reports and other statistical publications from national statistical offices, (3) Eurostat: Demographic Statistics, (4) United Nations Statistical Division. Population and Vital Statistics Report (various years), (5) U.S. Census Bureau: International Database, and (6) Secretariat of the Pacific Community: Statistics and Demography Programme. based on demographic models. https://databank.worldbank.org/reports.aspx?source=2&series=SP.DYN.LE00.IN&country=LIC

GDP per capita in constant & current local currency (World Bank)

***Constant LCU:** GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency.*

***Current LCU:** GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current local currency.*

Inflation (annual %) (World Bank)

Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

Heavy Episodic Drinking (population 15+) in the last 30 days (Eurostat)

Rationale

Heavy episodic drinking is part of the key indicators which provide information regarding the patterns of alcohol consumption in a given country. More specifically, it identifies the proportion of the population which consumes high levels of alcohol at single occasions, and consequently highlights the population which particularly has a higher risk of experiencing alcohol-related acute harm but also developing chronic health complications.

Definition

Heavy episodic drinking is defined as the proportion of adults (15+ years) who have had at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days. A consumption of 60 grams of pure alcohol corresponds approximately to 6 standard alcoholic drinks. Numerator: The (appropriately weighted) number of respondents (15+ years) who reported drinking 60 grams or more of pure alcohol on at least one occasion in the past 30 days. Denominator: The total number of participants (15+ years) responding to the corresponding question(s) in the survey plus abstainers.

Method of measurement

A representative sample of the adult population (15+ years) of the country is asked to answer questions in a survey. The first priority in the decision tree is given to internationally comparative, nationally representative surveys (in this order of preference: WHS, STEPS, GENACIS, and ECAS); second is national surveys.

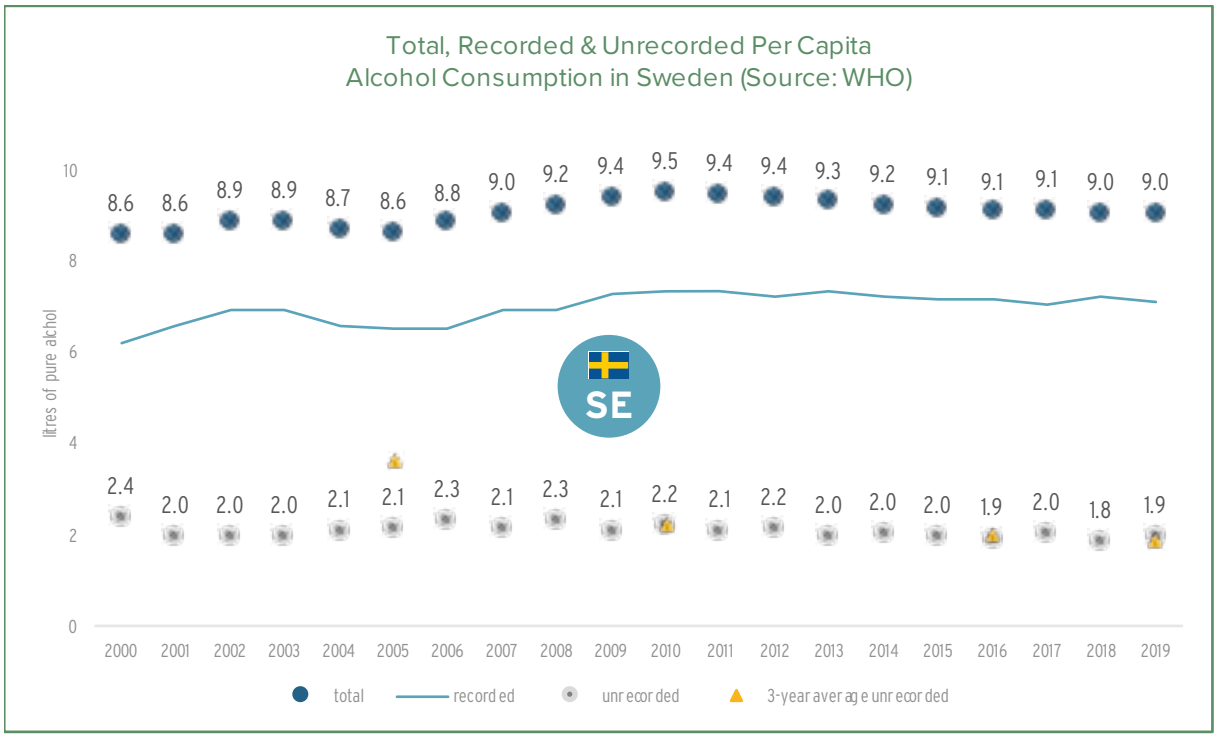
Some explanations as regards per capita alcohol consumption

Per capita alcohol consumption data can be obtained from various sources, such as WHO, OECD, national statistics offices, etc. Recorded per capita alcohol consumption by WHO was by far the most complete dataset and we opted to use this information for the analysis. However, while unrecoreded alcohol consumption may not be of major concern in Mediterianian countries (with the exception of Greece, at least after the economic crises and massive spirits tax/price increases), it represents a significant share of total per capita alcohol consumption in Nordic countries, especially after Finland and Sweden joined the EU in 1995 and cross-border shopping allowances changed.

Sweden: Different sources & estimates for unrecorded per capita alcohol consumption

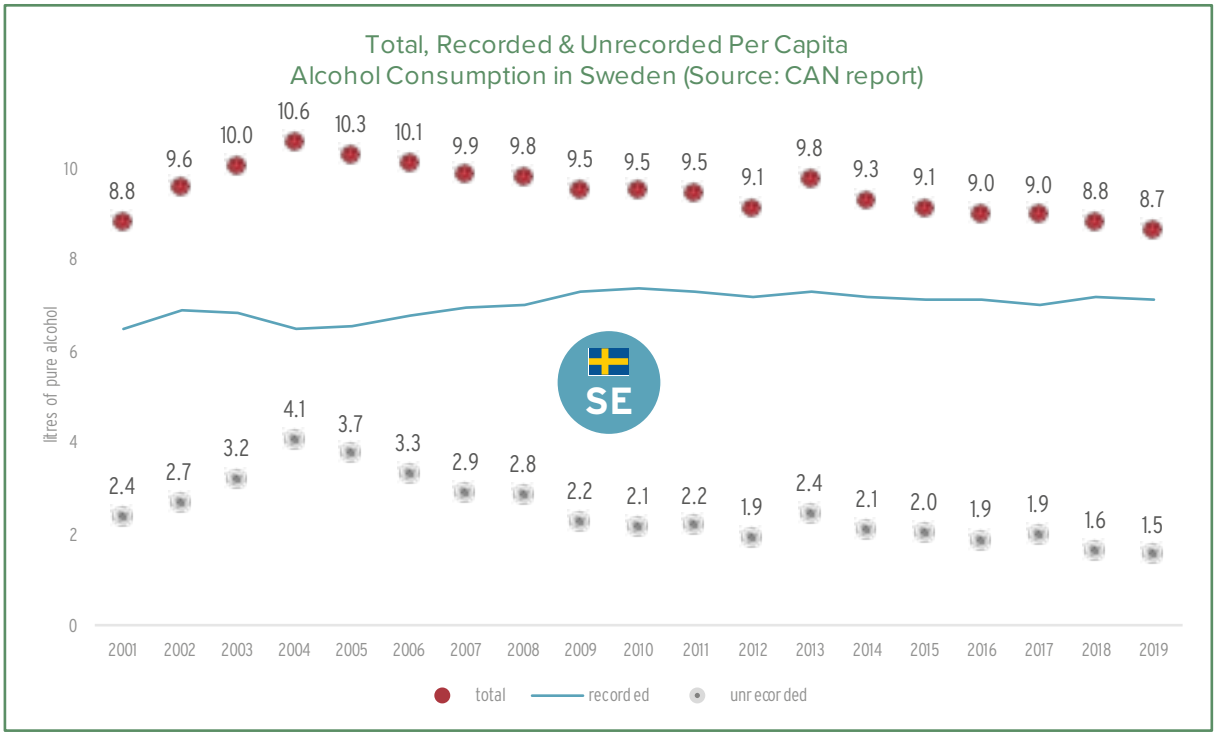
Data by WHO

While WHO provides unrecoreded per capita alcohol consumption for four years only, data for total per capita alcohol consumption is available from 2000 to 2019 (see https://www.who.int/data/gho/data/indicators/indicator-details/GHO/total-(recorded-unrecorded)-alcohol-per-capita-(15-)-consumption). Hence, if recorded per capita consumption is subtracted from total per capita consumption, we get to unrecoreded consumption data for each year. The derived unrecored per capita alcohol consumption figure is not consistent with the data provided for the four years mentioned above, especially for the year 2005. Nonetheless, this approximation is used for the chart below in order to show a trend, even if the period does not go back to the 1960s or at least to 1995, when Sweden joined the EU.

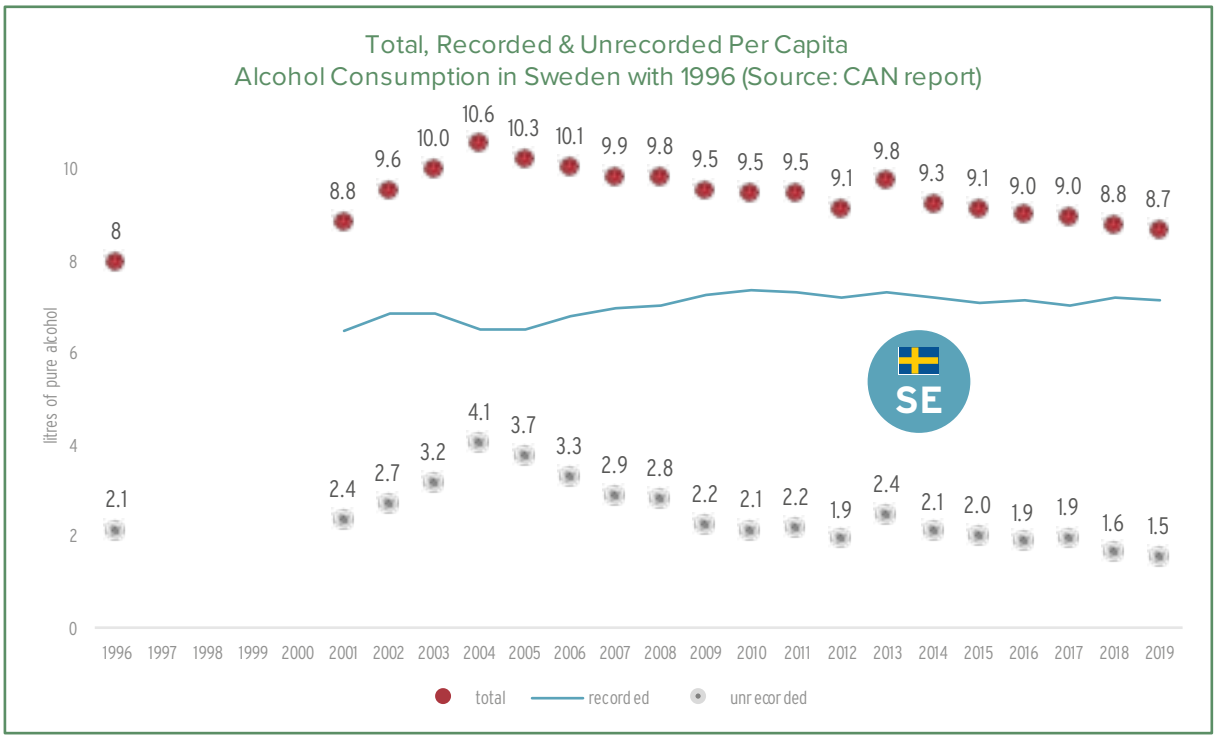


Data by CAN – Centralförbundet för alkohol- och narkotikaupplysning

The CAN report 202 (see https://www.can.se/app/uploads/2021/09/can-rapport-202-alkoholkonsumtionen-i-sverige-2001-2020.pdf) also provides data for total, recorded and unrecorded per capita alcohol consumption between 2001 and 2019. However, total per capita alcohol consumption differs significantly from the one provided by WHO, due to the different numbers reported for unrecorded per capita alcohol consumption. Especially, CAN data shows a sharper increase in total per capita alcohol consumption between 2001 and 2004 (+1.8 litres) and still +1.5 litres between 2001 and 2005. This stands in contrast to WHO data, according to which total per capita alcohol consumption remained relatively stable in the early 2000s. The biggest difference in total per capita alcohol consumption between WHO and CAN data can be observed in 2004: 1.9 litres. Moreover, while CAN reports a declining trend in total per capita alcohol consumption between 2005 and 2012 (-1.5 litres), the opposite is shown by WHO data (+0.8 litres). According to both datasets, total per capita alcohol consumption is slightly declining between 2012 and 2019, though the level reported by CAN is below the level reported by WHO.



Unfortunately, neither WHO nor CAN data cover the years after Sweden joined the EU in 1995 up to 2000. However, CAN could provide one additional data point for 1996, which can be seen in the chart below.



There are many data points missing, but an increase in total per capita alcohol consumption between 1996 and 2001 becomes apparent (+0.8 litres). Whether this increase occurred in 2001 or gradually between 1996 and 2001 cannot be determined from this chart.

Data by SoRAD – Centrum för socialvetenskaplig alkohol-och drogforskning

Desk research led to another report (see Forskningsrapport nr. 39, SoRAD, Stockholm 2006, http://www.diva-portal.org/smash/get/diva2:513943/FULLTEXT01.pdf) that shows data for the missing years and hence could fill the gap. I could find the following table showing unrecorded alcohol consumption in Sweden between 1993 and 2005:

Tabell 10. Resandeinförsel av alkohol 1993-2005, i liter ren (100 %) alkohol per invånare[3].

Resande-införsel	1993	1994	1995	1996[1]	1998	2000	2001[2]	2002[2]	2003	2004	2005
Sprit	0,5	0,4	0,5	0,5	0,7	0,6	0,7	0,7	1,0	1,2	1,0
Vin	0,2	0,2	0,2	0,3	0,4	0,6	0,6	0,7	0,8	0,8	0,7
Starköl	0,1	0,1	0,2	0,3	0,4	0,4	0,5	0,5	0,5	0,7	0,5
Totalt	0,7	0,7	0,8	1,1	1,6	1,6	1,8	1,9	2,3	2,7	2,3

[1] KALK:s huvudmaterial insamlat under perioden mars 1996 - februari 1997.
[2] Monitordata.
[3] Alla i tabellen redovisade undersökningar, förutom KALK (1996) och Monitormätningarna (2001, 2002 och 2003) genomfördes på våren respektive år, med en observationstid på 12 månader.
Källa: 1993-98: KALK-rapporten (Kühlhorn m fl., 2000). Källa: 2000: KAMEL-rapport (Leifman m fl., 2000).
Summan för varje alkoholsort och totalsumman har beräknats på basis av två decimaler. P.g.a. avrundning är summan av delmängderna inte alltid densamma som totalsumman.

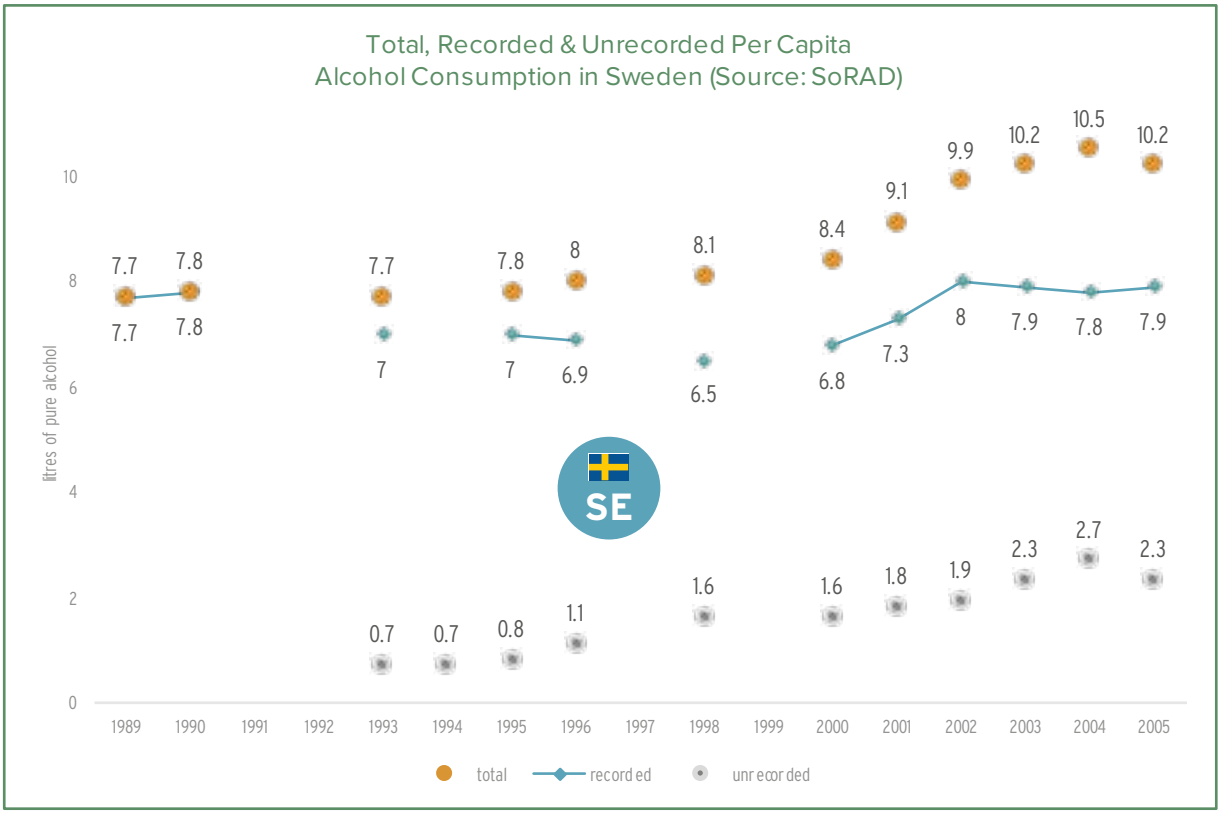
Unfortunately, table 10 above shows only values for unrecorded per capita alcohol consumption. However, the very same report contains a table showing total per capita alcohol consumption, though table 4 below does not cover all years:

Tabell 4. Alkoholkonsumtionen i Sverige under olika år: totalt och per dryckesslag (i antal liter ren [100 %] alkohol per invånare 15 år och äldre).

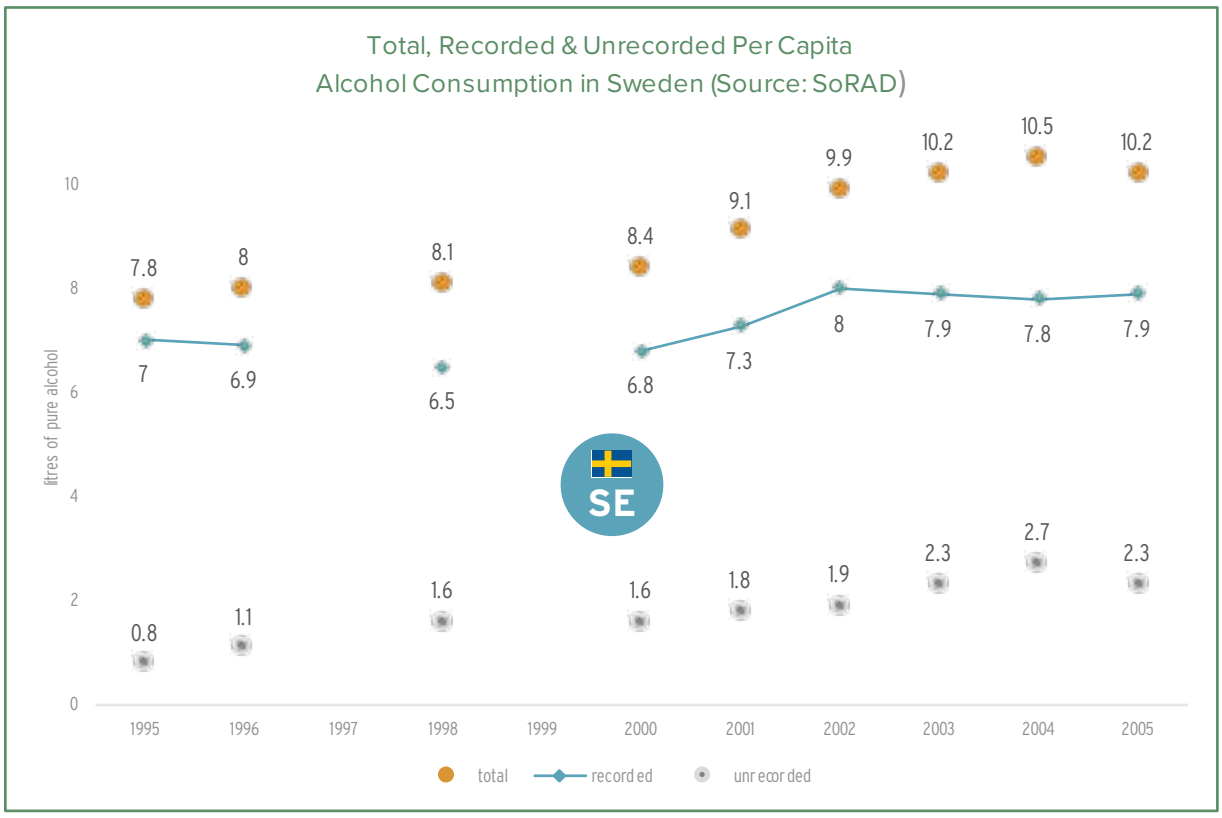
Typ av dryck	1976	1989	1990	1993	1995	1996	1998	2000	2001	2002	2003	2004	2005
Sprit	---	3,0	2,9	2,9	2,7	2,7	2,5	2,3	2,5	2,6	2,6	2,8	2,6
Vin	---	2,3	2,4	2,2	2,2	2,3	2,6	3,0	3,4	3,8	3,9	3,9	3,9
Starköl	---	1,3	1,3	1,3	1,6	1,7	1,8	2,1	2,4	2,7	2,9	3,1	3,0
Folköl	---	1,2	1,2	1,3	1,3	1,3	1,2	1,0	0,9	0,8	0,8	0,7	0,7
Totalt *	8,8	7,7	7,8	7,7	7,8	8,0	8,1	8,4	9,1	9,9	10,2	10,5	10,2

Källor: Kühlhorn, m.fl. 2000; Kühlhorn 2001; Leifman & Trolldal 2002; Leifman 2003; Norström 1997; Leifman & Gustafsson 2003; Gustafsson & Trolldal 2004.
Den totala konsumtionen beräknas utifrån den registrerade alkoholkonsumtionen samt utifrån skattningar av oregistrerad konsumtion.

If we combine these two tables, we get to the following chart.



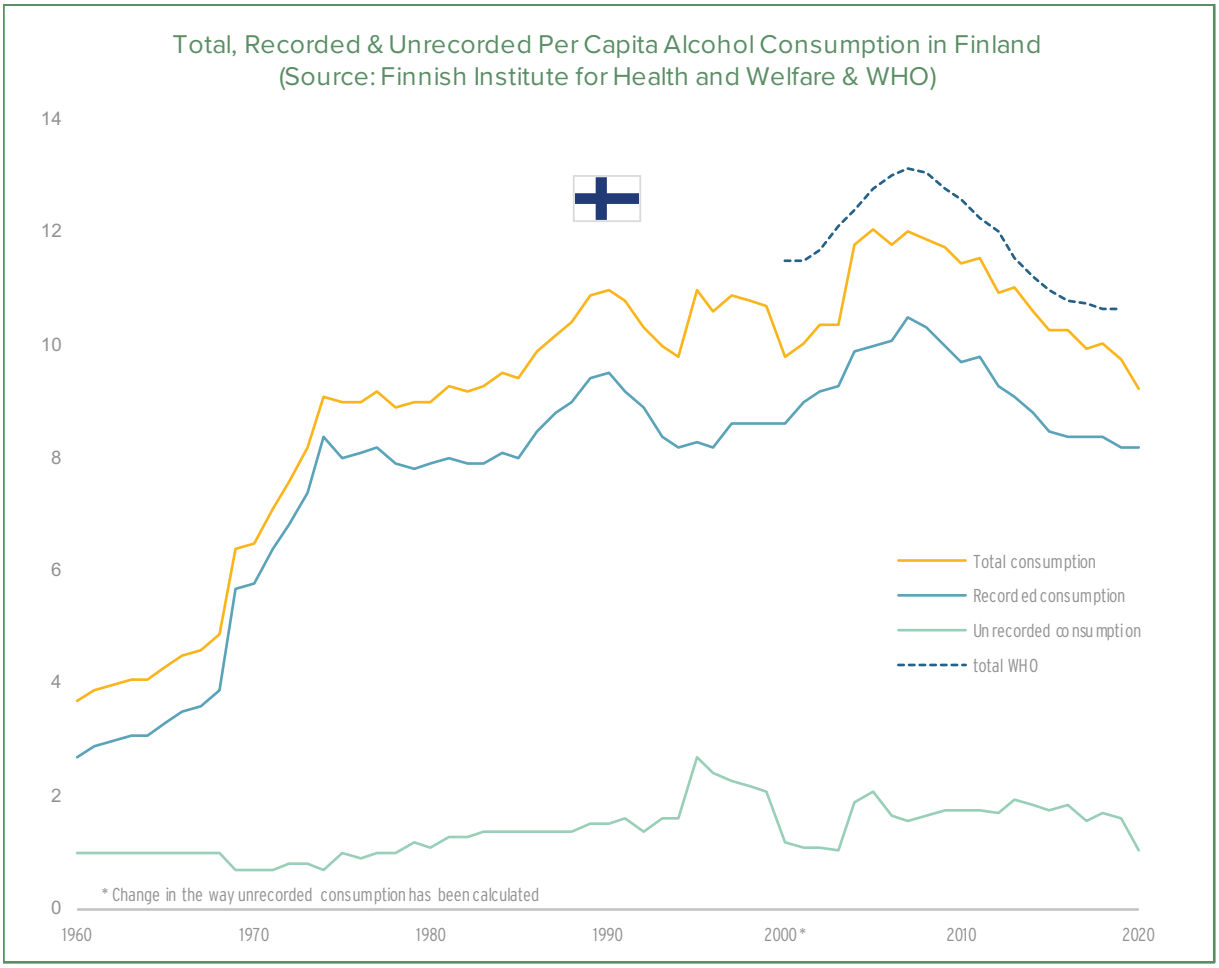
When we look at SoRAD data showing values only for the years after Sweden joined the EU, which is relevant here, the trend looks as follows:

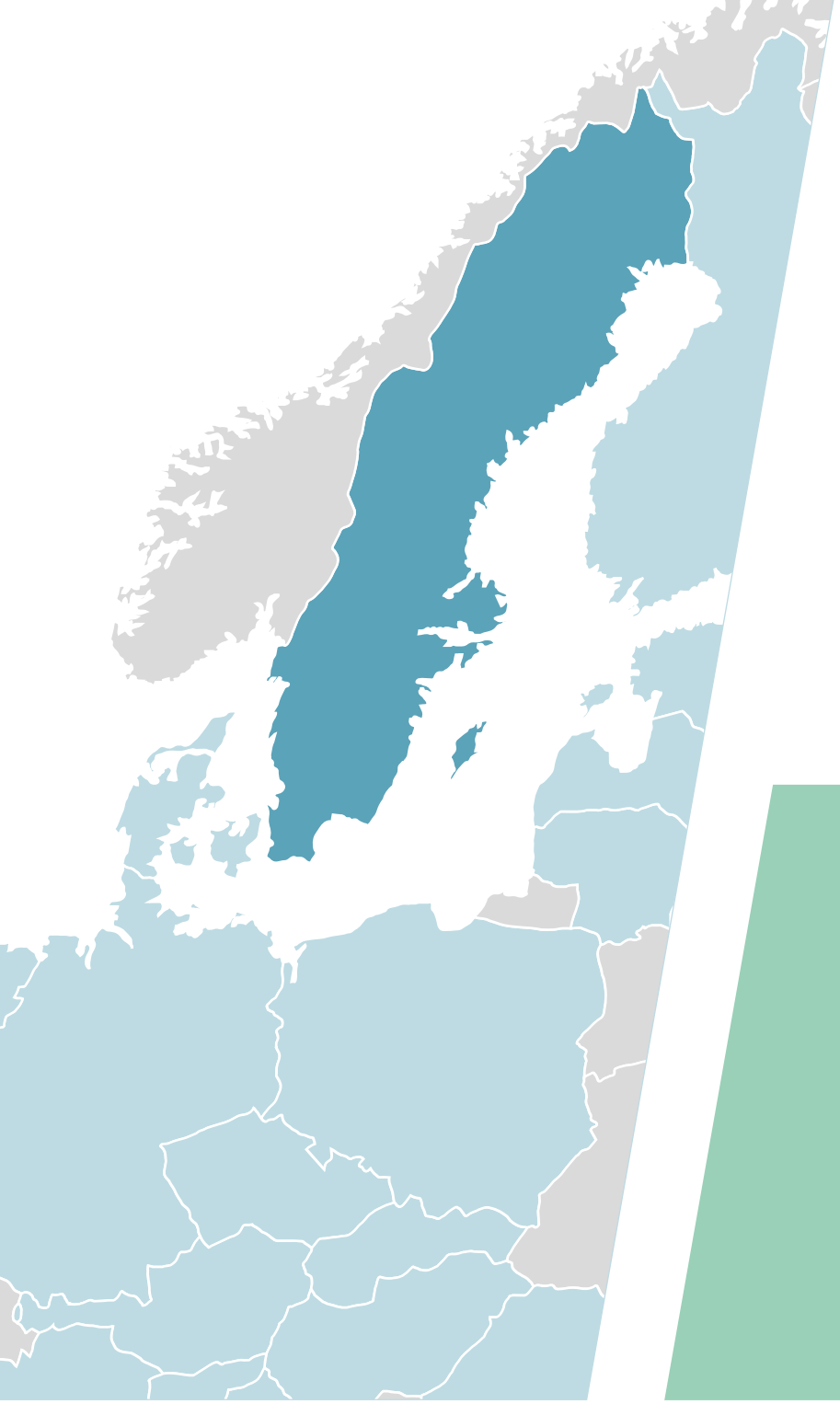


Interestingly, another report by SoRAD (see table 3, Forskningsrapport nr 67 SoRAD, Stockholm 2013, https://www.su.se/polopoly_fs/1.136450.1369721588!/menu/standard/file/Tal%20om%20alkohol%202012.pdf) shows slightly different levels for total per capita alcohol consumption in 1998 and 2005. In 1998, the total per capita consumption level was 0.1 litres above and in 2005 0.1 litres below the level provided in the source used for the chart above.

Finland: Per capita alcohol consumption data

The Finnish Institute for Health and Welfare provides long-term data not only for recorded, but also for unrecorded, and hence total per capita alcohol consumption. While recorded per capita alcohol consumption figures by the Finnish Institute for Health and Welfare (henceforth FIHW) match the data by WHO, total per capita alcohol consumption data (for the years available) by WHO differs and is always above the level reported by the FIHW.





rue Belliard 12, 1040 Brussels
info@spirits.eu www.spirits.eu
@spiritsEUROPE