What are the public health and safety benefits of the Swedish government alcohol monopoly?

Tim Stockwell / Thor Norström
Colin Angus / Adam Sherk
Mats Ramstedt / Sven Andréasson
Tanya Chikritzhs / Johanna Gripenberg
Harold Holder / John Holmes & Pia Mäkelä

April 2017

What are the public health and safety benefits of the Swedish government alcohol monopoly?

Tim Stockwell[1]
Thor Norström[2]
Colin Angus[3]
Adam Sherk[4]
Mats Ramstedt[5]
Sven Andréasson[6]
Tanya Chikritzhs[7]
Johanna Gripenberg[8]
Harold Holder[9]
John Holmes[10]
Pia Mäkelä[11]

[1] Director, Centre for Addictions Research of British Columbia (CARBC) and Professor, Department of Psychology, University of Victoria, PO Box 1700 STN CSC, Victoria, British Columbia, V8W 2Y2, Canada

[2] Professor, Swedish Institute for Social Research, Stockholm University, Stockholm, Sweden

[3] Research Fellow, University of Sheffield, Sheffield, UK

[4] Research Associate, Centre for Addictions Research of British Columbia (CARBC) and Doctoral Student, Social Dimensions of Health Research Program, University of Victoria, Victoria, British Columbia, Canada

[5] Head of Research, The Swedish Council for Information on Alcohol and Other Drugs (CAN), Stockholm, Sweden

[6] Professor, MD, Karolinska Institutet, Department of Public Health Sciences, Stockholm, Sweden

[7] Professor, National Drug Research Institute, Curtin University, Perth, Australia

[8] Director, Stockholm Prevents Alcohol and Drug Problems (STAD), Karolinska Institutet, Department of Clinical Neuroscience, Stockholm, Sweden

[9] Senior Scientist Emeritus and former Director of Prevention Research Center, Pacific Institute for Research and Evaluation, Berkeley, CA, USA

[10] Senior Research Fellow, University of Sheffield, Sheffield, UK

[11] Senior Scientist, National Institute for Health and Welfare, Helsinki, Finland

Acknowledgments

Executive Summary

Background

Sweden's government alcohol retail monopoly, Systembolaget, has a long history of organising the sale of alcoholic beverages while operating within a public health and safety mandate. Reporting to the Ministry of Health and Social Affairs, its mandate is to carefully regulate the distribution and sale of alcohol to the Swedish population so as to minimise possible harms from its consumption. It is able to achieve this by operating without a profit incentive. At the time of writing, it operates 436 Systembolaget liquor stores and also has about 500 licensed agency stores in rural areas, though these latter account for less than 1% of total sales. Stores normally operate 49 to 50 hours per week, between Monday and Saturday. Their trained staff are effective at restricting sales to under-age (<20 years) and intoxicated customers. Promotions and advertising of alcohol are strictly controlled. Sweden and other alcohol monopoly countries like Iceland and Norway stand out from the majority of other European countries by having relatively low per capita alcohol consumption. Swedish grocery stores are also currently permitted to sell beer with a strength up to 3.5% alcohol/volume.

The estimated average alcohol consumption among Swedish persons aged 15 years or older has declined from approximately 10 to 9 litres of pure alcohol per year during the last decade. About 20% comes from unofficial sources, mainly travellers imports and via smuggling. Using latest WHO methods, we estimate that in 2014 there were 1 919 net alcohol attributable deaths and 59 469 net alcohol attributable hospital stays, the latter costing 2.12 billion Kronor. If the disputed health benefits of moderate alcohol use are discounted, then there were 3 188 deaths and 64 297 hospital stays attributable to alcohol for Sweden in 2014, the latter at a cost of 2.48 billion Kronor. Over the past decade, several indicators of alcohol-related harm have declining trends, including alcohol-related deaths and number of patients treated with an alcohol-related diagnosis.

Aims

This report provides updated estimates of the public health and safety benefits to Sweden of retaining the government alcohol monopoly, Systembolaget. An international team of scientists estimated impacts on alcohol policy, consumption and related harms if the monopoly was privatised. We drew on new data up to 2014 and applied new analytic methods to update estimates last made by Norström et al in 2010 (1). We estimated increases in alcohol-related deaths, hospital admissions and crimes under two privatisation scenarios involving the sale of alcohol in (i) specialty liquor stores or (ii) grocery stores. Implications of the results for alcohol policy and future research are then discussed.

Methods

We proceeded through several analytic steps to estimate (i) likely changes to alcohol policies in Sweden under each privatisation scenario (ii) impacts of these policies on per capita alcohol consumption and, in turn, (iii) the impacts of this change in consumption on alcohol-related crime and health outcomes.

Step 1: The extent to which policy levers would change under privatisation scenarios. We employed comparisons with privatisation experiences in Scandinavia and North America to estimate the extent to which outlet density, days and hours of trading, average and minimum available prices of alcohol and promotions of all kinds would change under each of the two scenarios (see Table A1 below for summary).

Table A1: The estimated changes in key policy levers in two privatisation scenarios

Lever	Scenario 1 – Alcohol sold in Private Liquor Stores	Scenario 2 – Alcohol sold in Grocery Stores
Density of stores	200% increase	1500% increase
Sunday trading	An extra 12 hour day added	An extra 14 hour day added
Extended hours	44% increase	68% increase
Mean prices	Beer +4.9% Wine +6.0% Spirits +1.4%	Beer +2.4% Wine +3.0% Spirits +0.7%
Minimum prices	Beer -19.9% Wine -12.5% Spirits -20.6%	Beer -24.9% Wine -15.6% Spirits -25.7%
Promotions	Half the inverse of full ban effect	Inverse of the effect of a ban

Step 2: The independent effect of each policy lever on recorded per capita alcohol consumption. Based on systematic reviews, we developed best estimates of the effect (and the uncertainty of this effect) of changes in each of the policy levers on per capita alcohol consumption (see Table A2 below).

Step 3: The collective impact of all policy levers on total per capita alcohol consumption. The independent effects of each lever from Step 2 were combined into a single estimate of the impact on overall recorded per capita consumption (see Table A2 below). We estimated that per capita alcohol consumption in Sweden would increase 20.0% in Scenario 1 (specialty private liquor stores) and by 31.2% in Scenario 2 (grocery stores).

Step 4: Estimating the uncertainty around modelled changes in per capita consumption. We used a Probabilistic Sensitivity Analysis (PSA) framework to estimate 95% confidence intervals around the effects of each policy lever on consumption and the overall effects of privatisation under each scenario (also provided in Table A2 below).

Table A2: The estimated independent effect of changes in policy levers on recorded per capita consumption in Sweden (95% Confidence Intervals in brackets)

Lever	Scenario 1 – Private Liquor Stores	Scenario 2 – Grocery Stores
Density of stores	9.5% (7.0% to 12.0%)	16.4% (14.3% to 18.5%)
Sunday trading	1.0% (-5.1% to 7.1%)	1.2% (-5.9% to 8.3%)
Extended hours	3.8% (2.9% to 4.8%)	4.8% (3.6% to 6.0%)
Mean prices	-2.8% (-4.4% to -1.2%)	-1.4% (-2.2% to -0.6%)
Minimum prices	13.3% (7.3% to 19.4%)	16.7% (9.1% to 24.3%)
Promotions	2.5% (-0.2% to 5.2%)	5.0% (-0.4% to 10.4%)
All policies	**20.0% (15.3% to 24.7%)**	**31.2% (25.1% to 37.3%)**

Step 5: Impacts on alcohol-related harms under each scenario. Two main methods were utilised, namely, A) utilising ARIMA time series analyses of historical Swedish data on relationships between per capita alcohol consumption and alcohol-related harms B) application of the WHO Global Burden of Disease (GBD) methodology to estimate alcohol attributable mortality and morbidity for Sweden in 2014 and, further, how this would change under each scenario. Outcomes examined under Method A were deaths from alcoholic liver cirrhosis, suicide and other injuries plus assault and drink driving offences recorded by police.

The GBD method uses mathematical modelling techniques to combine evidence on alcohol consumption, the risks of harm from drinking at different levels and the extent of alcohol-related mortality and hospitalisation for some 60 injury and illness conditions. The method was adapted to provide estimates of how *changes* in alcohol consumption contribute to changes in deaths and hospital stays. The GBD method also enables these changes in alcohol-related harm to be broken down into age and sex groups to allow estimation of how effects differ across the population. Some methodological innovations were required to estimate the change in alcohol attributable morbidity and mortality, such as how the proportions of 'binge' drinkers in each population sub-group would change as per capita alcohol consumption increased. We received data on typical economic costs of hospital stays for different diagnoses for 2014 from the Association of Local Authorities and Regions.

Results
Results of the two methods for estimating changes in alcohol-related harm under the two privatisation scenarios are summarised in Tables A3 and A4. These two quite different methodologies arrived at similar overall estimates regarding impacts on alcohol-related deaths in Sweden resulting from the project increases in consumption. In Scenario 1 (private liquor stores), the ARIMA time series method estimated an additional 850 deaths per year (2014 data) whereas the WHO GBD method generated an estimate of 795 deaths. In Scenario 2 (grocery stores), the ARIMA time series method estimated an additional 1 418 deaths per year whereas the WHO GBD method estimated an extra 1 271. It should be noted, however, that the ARIMA time series method was applied to a smaller group of potentially alcohol-related deaths than was the WHO method so they are not strictly comparable. The WHO method mostly has a more conservative set of estimates of the risk relationships between alcohol consumption and mortality. However, for one cause of death (alcoholic liver cirrhosis), remarkably, we obtained exactly the same estimates from the two methods in Scenario 1 and nearly identical results in Scenario 2.

The ARIMA time series method also resulted in large estimated increases in alcohol-related crimes, specifically 21% more assaults and 34% more drink driving offences under Scenario 1. In Scenario 2, 34% more assaults and 58% more drink driving offences were estimated.

The baseline estimate from the WHO GBD method with current alcohol policies in place was that alcohol contributed to a total of a net of 1 919 deaths in 2014, compared with 3 404 using time

series analyses of uniquely Swedish data. The WHO GBD method generated particularly low estimates for impacts on injuries in comparison with the ARIMA method.

Table A3: Estimated impacts of each privatisation scenario on alcohol-related harm based on ARIMA analyses of Swedish time series data

Harm measure	Total Sweden 2014	Scenario 1	Scenario 2
Alcoholic cirrhosis deaths	429	160 (+37.2%)	273 (+63.7%)
Injury deaths	1 833	399 (+21.8%)	660 (+36.0%)
Suicide deaths	1 142	291 (+25.5%)	485 (+42.4%)
Total deaths	**3 404**	**850 (+24.5%)**	**1 418 (+41.7%)**
Assault crimes	83 324	17 407 (+20.9%)	28 680 (+34.4%)
Drink-driving	13 769	4 669 (+33.9%)	7 940 (+57.7%)

The WHO GBD method was also used to derive estimates of the number of alcohol attributable hospital stays due to alcohol in Sweden and how this would change under each privatisation scenario. The baseline estimate with current alcohol policies in place is that alcohol contributed to a total of 59 469 hospital stays in 2014 which would increase by 13 206 (+22.2%) in Scenario 1 and by 19 860 (+33.4%) in Scenario 2. The direct cost to government of these additional hospital stays was estimated to be 549 million kronor in Scenario 1 and 852 million kronor in Scenario 2.

Table A4: The estimated impacts of each privatisation scenario on alcohol-related harm based on an adaptation of the WHO Global Burden of Disease methods

Harm measure	Total Sweden 2014	Scenario 1 extra*	Scenario 2 extra*
Alcohol attributable deaths			
Cancers	678	123 (+18.1%)	194 (+28.6%)
Mental health	247	50 (+20.2%)	70 (+28.3%)
Cardiovascular	-277	269 (n/a)	436 (n/a)
Digestive	412	168 (+40.8%)	285 (+69.2%)
Injuries	1 022	170 (+16.6%)	259 (+25.3%)
Infectious diseases	117	18 (+15.4%)	28 (+23.9%)
Type 2 diabetes	-279	-2 (n/a)	-1 (n/a)
Total deaths	**1 919**	**795 (+41.4%)**	**1 271 (+66.2%)**
Alcohol attributable hospital stays			
Cancers	3 074	588 (+19.1%)	928 (+30.2%)
Mental health	28 407	5 657 (+19.9%)	7 913 (+27.9%)
Cardiovascular	5 423	2 321 (+42.8%)	3 729 (+68.8%)
Digestive	2 560	1 200 (+46.9%)	2 017 (+78.8%)
Injuries	17 835	2 942 (+16.5%)	4 487 (+25.2%)
Infectious diseases	3 021	488 (+16.2%)	765 (+25.3%)
Type 2 diabetes	-853	10 (n/a)	21 (n/a)
Total hospital stays	**59 469**	**13 206 (+22.2%)**	**19 860 (+33.4%)**

The WHO GBD method estimated that about two thirds of alcohol attributable deaths and hospital stays involved men. The majority of alcohol-caused mortality occurred in the 65+ age

group, while the 45 to 64 age group had the highest number of hospital stays. However, deaths of younger people involve the loss of many years of life and are of particular concern. It was estimated that there would be an additional 33 deaths involving people aged under 30 years of age in Scenario 1 and 48 under Scenario 2. It was also estimated that there would be an additional 1 659 hospital stays for this age group in Scenario 1 and 2 443 in Scenario 2. More specifically, it was estimated there would be an additional 496 hospital stays involving under-age drinkers in Scenario 1 and 728 in Scenario 2. Given that WHO GBD methods appear to underestimate alcohol attributable injuries, these figures are likely too low.

Implications for Sweden

Our results indicate that abolishing Systembolaget would lead to significant increases in alcohol consumption and, as well, in the health and social problems caused by alcohol and in economic costs. This is because privatisation typically leads to a reduction in the minimum price of alcohol, an increase in the number of outlets selling alcohol, an increase in the trading hours of those outlets, and increased promotion and marketing of alcohol.

The health impacts include increased deaths and hospital stays due to alcohol attributable cancers, mental health, gastrointestinal, cardiovascular, injury, and infectious disease conditions. Broader impacts on society beyond the estimated increases in assaults and drink driving offences can also be expected under both privatisation scenarios including increased absenteeism, child abuse and family breakdown (2).

It is sometimes suggested that effective regulation of alcohol prices, availability and marketing could be achieved within a private market system. In practice, however, the increased number of commercial actors in a private system means more lobbying of policymakers towards allowing more competition and less regulation. International and Swedish research experience teaches us that increased competition in alcohol markets inevitably leads to increased population level consumption and serious related harms.

This report addresses potential consequences of privatising alcohol sales in Sweden in terms of changes in consumption and harms for the general population. In addition to these effects, an important argument for the monopoly in Sweden is its potential to reduce alcohol availability among under-aged persons. Along with government monopoly stores in other countries, Systembolaget stores stand out in comparison with privately owned grocery stores selling alcohol by consistently requiring age IDs and denying alcohol sales to over 95% of under-aged persons.

Recommendations for Sweden

Considering the significant public health and safety benefits associated with a government alcohol monopoly, we recommend the continuation of Systembolaget as the sole distribution network for the sale of alcohol for off-premise consumption.

We also recommend that consideration is given to areas in which Systembolaget could generate improved outcomes by strengthening its policies. In particular, alcohol pricing in a government monopoly tends to be, in general, lower than in a privatised system and the overall levels of prices need to be regularly reviewed to ensure they at least keep up with inflation. Of most potential importance, however, would be for the Swedish government to consider the introduction of an explicit minimum price per standard drink (12g ethanol) for all alcoholic beverages as is currently being considered in other European jurisdictions. In addition, any policy that increases competition in the alcohol market in Sweden is likely to have an adverse effect on public health and safety by driving down minimum prices even further and by increasing access, especially to under-aged drinkers. It is also important to protect the monopoly of the retail sale of alcohol by not eroding it through seemingly minor exceptions. A prime example is the advent of alcohol sales via the Internet or permitting the sale of alcohol at farms, something currently being proposed. Protecting the monopoly on the retail sale of alcohol will also protect the health and safety of Swedish people.

We also identify a number of areas where future research might be usefully focused to strengthen our understanding of the public health and safety impacts of alcohol policies that affect the price and availability of alcohol.