

# Extended opening hours at nightclubs in Visby: An evaluation of a trial in the summer of 2014

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## Abstract

**Background and aims:** During 10 weeks in the summer 2014 opening hours in nightclubs in Visby (Sweden) were extended by 1 hour, postponing the permitted closing time from 2 to 3 a.m. A number of preventive efforts such as Responsible Server Training, and an intensified cooperation between the police and the nightclubs were strengthened in connection with the trial. The aim of this study was to evaluate the impact of this trial on police-reported violence. **Data and methods:** To estimate the effect of the trial on violence, we compared the violence rate during the intervention period (week 24–week 33, 2014) with the violence rate in the corresponding period in Visby in 2010–2013. The intervention period thus comprised 10 weeks, and the pre-intervention period 40 weeks. As outcome measure we chose police-reported assaults that had occurred at night (midnight–6 a.m.). As control series we used assaults daytime (6 a.m.–midnight). The intervention effect was estimated with the method of “difference in differences” (DiD). Interviews with key informants provided the study with an explanatory context for the trial outcomes. **Results:** The intervention effect was strongly statistically significant with a reduction of

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3.336 reported assaults at night per week compared to the pre-intervention period. This represents a decrease of 71%. **Conclusion:** The trial with an extension of opening hours at nightclubs in Visby was followed by a reduction in police-reported violence. This unexpected outcome is likely to be the result of (i) the simultaneous strengthening of efficient preventive measures, and (ii) a decreased congestion in the streets resulting from increased spread in closing hours.

## Keywords

alcohol, difference in differences, extended opening hours, Sweden, violence

## Background

Visby is a city located on the island of Gotland, about 100 kilometres south-east of the mainland of Sweden. The city is a popular tourist destination during summer, both for those who enjoy its medieval history as for those who enjoy the nearby beaches and nightlife. During 10 weeks in the summer of 2014 opening hours in nightclubs in Visby were extended by 1 hour, postponing the latest closing hour from 2 to 3 a.m. The aim of the present study was to evaluate the impact of this trial on police-reported violence.

There are several potential mechanisms that link extended opening hours to increased violence. These differ depending on theoretical and analytical scope. There have been two major theoretical approaches underpinning efforts to reduce alcohol-related harm in licensed outlets: (i) a public health approach with focus on alcohol availability, and (ii) a situational crime approach emphasising changes in the environment (Humphreys & Eisner, 2014). From the availability perspective, the key mechanism is that extended opening hours may lead to increased drinking, per patron (Chikritzhs & Stockwell, 2002), which in turn is a risk factor of violent incidents (Graham, Schmidt, & Gillis, 1996). Longer opening hours may also increase drinking indirectly by producing a delay in the hour that people visit the nightclub, giving more time for “pre-drinking”, which in turn increases the risk that patrons are already intoxicated on arrival (Wells, Graham, & Purcell, 2009).

While the availability perspective clearly predicts more problems with extended opening hours, a focus on situation and environment yields a less clear prediction. On the one hand, longer opening hours may lead to more patrons, thereby increasing the risk of crowdedness and provocations. On the other hand, extended opening hours mean that the exits from pubs are spread over a longer period of time, which potentially may reduce the risk of conflict due to lower levels of congestion outside the pubs. An example of a well-designed study that found beneficial effects of extended opening hours is Green, Heywood, and Navarro (2014). The study focused on the liberalisation of opening hours that was carried out in England and Wales in 2005. The findings suggested a reduction in the number of traffic accidents at night compared with the control area (Scotland). This was interpreted as an effect of reduced traffic congestion due to the circumstance that not all guests were leaving the bars at the same time. However, the authors are anxious to point out that even though they can document one positive consequence of the reform, it may also have had negative effects in the form of increased alcohol consumption leading to an increase in social and health problems.

Systematic reviews of the literature (Hahn et al., 2010; Sanchez-Ramirez & Voaklander, 2017; Stockwell & Chikritzhs, 2009; Wilkinson, Livingston, & Room, 2016) suggest that increases in opening hours of at least 2 hours generally increase alcohol-related harm rates, while the evidence for determining effects of

smaller changes in opening hours (less than 2 hours) was insufficient according to one review (Hahn et al., 2010). In a review of the international literature specifically addressing the effect of changes in opening hours on violence, Rossow and Norström (2012) identified nine studies. In five of these studies associations emerged in the expected manner of extended opening hours leading to increased violence. In two studies the results did not follow these expectations, while in the two remaining ones no significant effects were found. It was also noted that most of these studies used a weak design, for example, control series were seldom included.

Subsequent to the reviews cited above, some well-designed studies that address the impact of small changes in opening hours (which is the focus of the current study) have been published. The study by Rossow and Norström (2012) focused on 18 Norwegian cities during the 2000–2010 period that had changed the opening hours by maximum 2 hours. Most of the cities had restricted opening hours by 1 hour, but some cities had imposed extensions. According to the results an extension of opening hours by 1 hour led to a statistically significant increase in violence at night of about 16%, net of the development of violence in the control areas. Similar results were found in Newcastle (Australia) when opening hours were restricted from 5 a.m. to 3.30 a.m. which was followed by a significant decrease in police-reported assaults (Kypri, Jones, McElduff, & Barker, 2011). It is noteworthy is that the effect appeared to be sustained during a five-year follow-up (Kypri, McElduff, & Miller, 2014). Another study, focusing on alcohol-related injuries, found that a 1-hour extension of opening hours in some Amsterdam (the Netherlands) night time areas was associated with 34% more alcohol-related injuries (Goeij, Veldhuizen, Buster, & Kunst, 2015).

### **The Visby trial**

The trial with extended opening hours in Visby ran over the period June 9, 2014–August 17,

2014 (week 24–week 33). The City Council, which had taken the decision to run the trial, stated that the overall objective of the trial was a general lowering of the level of intoxication and thereby a reduction of public disorder and insecurity in the public space. Only nightclubs were eligible for the extended opening hours, that is, venues that have dancing permits, and where bouncers are required. This means that a fairly large number of restaurants (approximately 60 in the summer) were not affected by the trial. All of the six nightclubs in Visby applied for and received permission to extend their opening hours from 2 to 3 a.m. A number of preventive efforts were strengthened in various ways in connection with the trial.

To achieve this, there was also increase in supervision of venues with a focus on controlling the level of intoxication among visitors. This intervention was communicated beforehand during a visit by the alcohol inspector and was directed towards all venues with later opening hours, i.e., not only venues with extended opening hours to 3 a.m. but also those open until 2 a.m. After the visit, the observations of the alcohol inspector were communicated to both the venue owner and the bouncers. If regarded necessary, a follow-up visit was conducted to see how the situation developed.

Another approach to reach a lower level of intoxication in the venues was to require that all staff in venues with opening hours to at least to 2 a.m. were trained in the programme Responsible Server Training (RST). The RST programme has been proved to be efficient for reducing violence linked to the serving of alcohol at bars in several studies (Norström & Trolldal, 2013; Trolldal, Brännström, Paschall, & Leifman, 2012; Wallin, Norström, & Andreasson, 2003).

The RST activities were thus intensified during the summer of 2014 with focus on staff working in venues with later opening hours. The training included the following parts: how to manage conflicts in the venue, information on Swedish alcohol law, alcohol-related violence in entertainment venues, and the medical

effects of alcohol. To pass the training it was also necessary to pass a final written exam about the content of the course.

Another part of the preventive work was a strengthening of the cooperation between the police and the bouncers at the nightclubs with extended opening hours. This included meetings before the summer season, where the police informed bouncers about the Swedish Alcohol Act. In addition, the bouncers informed the police about what they regarded as their concern and gave their view on how the police could assist them. A further strengthening of the preventive work in relation to extended opening hours was that permission to extend opening hours to 3 a.m. was granted on the condition that the beneficiary had a written alcohol and drug policy for the premises. To sum up, a significant amount of preventive work was put into practice in connection with the Visby trial of extended opening hours. Although most of these activities were directed towards the venues taking part in the trial there were most likely some spillover effects for other venues, in particular those open until 2 a.m.

## Data and methods

### *Estimating the experiment effect*

To estimate the experiment effect on violence, we compared the violence rate during the intervention period (week 24–week 33, 2014) with the violence rate in the corresponding period in 2010–2013 in Visby (defined as Visby inside the city walls, “Inre hamnen” and “Östercentrum”). The intervention period thus comprised 10 weeks, and the pre-intervention period 40 weeks.

As outcome measure we chose police-reported assaults that had occurred at night (midnight–6 a.m.). In this type of analysis, it is important to control for the general trend in assaults. It is further important that the control variable is as similar as possible to the outcome variable during the pre-interventions period. A fruitful approach applied in some studies is to

**Table 1.** Regression analysis of assaults nighttime as output and two indicators of assaults daytime as input. Based on the pre-intervention period ( $n = 40$ ).  $R^2 = 0.375$ .

Indicator	Estimate	SE	$p$
Assaults daytime, indoor	0.641	0.336	0.065
Assaults daytime, outdoor	1.275	0.361	0.001

**Table 2.** Correlations between outcome (assaults nighttime) and three potential control indicators of assaults daytime. Based on the pre-intervention period ( $n = 40$ ).

Indicator	Correlation
Assaults daytime, indoor	0.456
Assaults daytime, outdoor	0.591
Synthetic control series	0.638

use a so-called synthetic control series instead of selecting a single control series (Abadie, Diamond, & Hainmueller, 2010). The synthetic control series is a weighted sum of several potential control series in which the weights are fixed in a manner that maximises the similarity between the outcome and the synthetic control series. In our case the number of potential control series is limited to two other violence indicators pertaining to Visby: indoor daytime assaults (6 a.m.–midnight) and outdoor daytime assaults. A common praxis is to use control series pertaining to an adjacent area that is not affected by the intervention. However, lacking any adjacent area that is reasonable similar to Visby, we did not find this option feasible in the present case.

The weights for constructing the synthetic control series were based on the estimates from a regression analysis between the outcome measure and these two indicators during the pre-intervention period (Table 1). As we see in Table 2 the correlation between the outcome measure and the synthetic control series is slightly stronger than the correlations between the outcome measure and the two series included in the synthetic series.

The intervention effect was estimated with the method of “difference in differences”

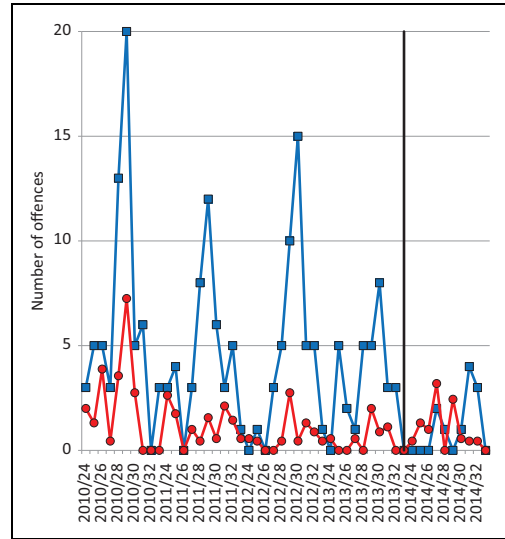
(DiD). This approach is often used in econometrics to evaluate policy changes that have been implemented in a quasi-experimental form (Angrist & Krueger, 1999). Examples of other alcohol epidemiological studies that use DiD include Ramstedt, Leifman, Müller, Sundin, and Norström, (2013) and Han, Branas, and MacDonald (2016). The DiD model had the following specification:

$$A = b_1 E + b_2 T + b_3 E * T + e$$

where A is the assault indicator with the observations for nighttime and daytime (the synthetic control series) pooled into one single series. E is a dummy variable that captures possible differences between the outcome (nighttime) and the control series (daytime) before the intervention. It takes the value 1 for the outcome and 0 for the control series. T is a time period dummy that captures factors that would affect violence also in the absence of the intervention. It takes the value 1 in the intervention period and 0 in the pre-intervention period. E\*T is the intervention variable. The parameter of interest is thus  $b_3$ , which captures the intervention effect. Time dummies were included to control for other factors that influence violence (time fixed effects). Robust standard errors were used, which gives a more conservative estimate of the statistical significance.

### Background interviews

We also conducted 11 background interviews with key informants. The purpose of this was to highlight experiences of the trial, which are not captured with available statistics. The interviews were performed with representatives from the police, the social services, a taxi company, residents of Visby, restaurateurs, a representative from Visby Residents' Association (Visby innerstadförening), an alcohol prevention coordinator, a bounce manager at a nightclub that participated in the experiment and a representative from Visby harbour. All informants had held the same position the previous summer (2013), in most cases, they had many



**Figure 1.** Police-reported assaults nighttime (midnight–6 a.m.) = squares, and daytime (synthetic control series) = circles.

years of experience of Visby during summer, either as professionals or as residents. The list of informants was suggested by the Public Health Strategist at the region of Gotland on the basis of the issues that the study aimed at capturing.

The interviews were conducted in Visby face to face as semi-structured interviews during August 2014, with the exception of the alcohol prevention coordinator who was interviewed by telephone in September 2014. The questions in the interviews were adapted to the role of the informant; e.g., the police officer was mainly asked about whether the trial had spurred changes with regard to work routines and preventive measures, while residents were asked about changes in the level of noise and disturbances. The interviews took 20–60 minutes to complete and were recorded on tape.

## Results

### DiD estimation

As Figure 1 shows there was a decreasing trend in assaults during the summer months since

**Table 3.** Difference-in-differences estimates of the intervention effect on assaults.

	Estimate	SE	p
E	3.484	0.576	<0.001
Time	-0.817	1.333	0.542
Intervention	-3.366	0.807	<0.001

2010; this applies to both daytime and night-time assaults. The lowest levels were recorded for 2014. The model estimates (Table 3) confirm the graphic image; the intervention effect is strongly statistically significant with a reduction of 3.336 reported assaults at night per week compared to the pre-intervention period. This represents a decrease of 71%.

Table 4 gives an overview of the experiences of the trial reported by the 11 informants who were interviewed. Generally, increased extent and quality of preventive measures are reported

from representatives for the police, the alcohol inspection office, nightclubs and restaurants. There were also unanimous reports of less congestion in the streets late at night. Reports with regard to the level of noise and disturbances late at night were mixed; that is, no change, or a worsening of the situation in the sense that the hours of noise and disturbances were prolonged. On the whole the interviewees reported positive experiences of the trial.

### Discussion

According to our results the level of violence was at a significantly lower level during the trial period with extended opening hours in Visby in the summer of 2014 compared with the corresponding period during the previous four years. The study that seems most feasible to compare with is the one by Rossow and Norström (2012), since they, too, examined the

**Table 4.** Overview of experiences of the trial reported by various informants.

Informant	Experiences
Police officer	<ul style="list-style-type: none"> <li>● adjusted work schedules to match extended opening hours</li> <li>● changed work routines to improve cooperation with restaurants and bounces</li> </ul>
Social service worker	<ul style="list-style-type: none"> <li>● no changes</li> </ul>
Alcohol inspection officer	<ul style="list-style-type: none"> <li>● more inspections during the trial period</li> </ul>
Taxi driver	<ul style="list-style-type: none"> <li>● less congestion of people in streets at closing hours</li> <li>● less stressful work situation at peak hours</li> </ul>
Bounce manager (at a nightclub that took part in the trial)	<ul style="list-style-type: none"> <li>● intensified RST</li> <li>● smoother exiting late at night</li> <li>● better cooperation with the police</li> <li>● less congestion of people in streets at closing hours</li> <li>● less congestion of people in streets at closing hours</li> </ul>
Restaurateur (did not take part in the trial)	<ul style="list-style-type: none"> <li>● less congestion of people in streets at closing hours</li> </ul>
Nightclub owner (took part in the trial)	<ul style="list-style-type: none"> <li>● intensified RST</li> <li>● clarification of RST when employing summer staff</li> <li>● less congestion of people in streets at closing hours</li> <li>● better cooperation with the police</li> </ul>
Resident 1	<ul style="list-style-type: none"> <li>● prolonged time period with noise</li> </ul>
Resident 2	<ul style="list-style-type: none"> <li>● no change in noise level</li> </ul>
Representative of Visby Residents' Association	<ul style="list-style-type: none"> <li>● mixed reports from members of the association with regard to worsening of noise and prolonged disturbances</li> </ul>
Representative of Visby harbour	<ul style="list-style-type: none"> <li>● fewer large groups of people gathering in the harbour late at night</li> </ul>

RST = Responsible Server Training.

impact of small changes in opening hours in a country (Norway) in a similar drinking culture to that of Sweden. Their estimate, implying that a 1-hour extension of opening hours was associated with a 16% increase in nighttime violence, is thus in stark contrast to our estimate of a reduction with 71%. An interesting and important question is of course how this unexpected outcome should be interpreted.

However, it should be noted that the most recent review of studies of changing opening hours concluded that the evidence was less compelling for an impact on assaults compared with other outcomes such as injuries and alcohol-related hospitalisations (Sanchez-Ramirez & Voaklander, 2017). However, this conclusion was based on the fact that several studies found no effect rather than the counter-intuitive results revealed in the present study with a reduction in violence with longer opening hours.

There seem to be two main factors that are crucial for understanding the positive results of the Visby trial. First, the trial spurred the implementation or strengthening of a number of activities that are documented to be effective for curbing alcohol-related violence, including RST and cooperation between restaurants and the police. The implementation of these activities was probably facilitated by the fact that the restaurant owners knew that the trial would be evaluated, and that a favourable outcome (that is, no increase in violence during the trial) was essential for a prolongation of the extended opening hours. (Here we may note that the extended opening hours were indeed in force also during the summer of 2015.) To our knowledge, our study is the first to evaluate the impact on violence of extended opening hours in a trial including such massive preventive interventions, and further studies evaluating similar trials are warranted to replicate our findings.

Another likely important factor was that the extension of opening hours was not granted to all restaurants, implying that closing hours became more spread out. This should have led

to less congestion in the streets because of the decreased pressure of all patrons exiting various premises at the same time; this is indeed corroborated by the interviews. It is also worth noting a study of extended opening hours in England and Wales came to a similar conclusion as traffic accidents went down in relation to this change (Green et al., 2014).

Before concluding, some limitations of the study should be noted. It is well known that a substantial fraction of violence incidents is not reported to the police. This likely makes the assault indicators more erratic, increasing the confidence interval of the estimated intervention effect. However, as there is no reason to think that the fraction of unreported nighttime incidents would vary systematically across time, it should not bias the estimate of the intervention effect. Although violence is a relevant and often-used outcome in evaluations of the present kind, it should be recognised that there are certainly other potential negative consequences of extended opening hours (e.g., more disturbing noise in the streets). Another limitation is that we do not know whether the information obtained in the interviews is generalisable, i.e., to what extent this information would be different if other informants had been selected. In this case, however, it is hard to see an alternative strategy to ours, namely to rely on recommendations from local experts. However, the most serious study limitation is that we cannot disentangle the effects of the various factors that contributed to the observed decrease in violence.

To conclude, the outcome from our evaluation suggests that the 1-hour extension of opening hours in Visby did not lead to increased nighttime violence, but was instead followed by a marked decrease in violence rates. This unexpected outcome is probably due to (i) the simultaneous implementation of efficient preventive measures to manage and prevent harms associated with greater nighttime alcohol availability, and (ii) decreased congestion in the streets resulting from increased spread in when restaurants were closing. The results have

limited generalisability to other settings due to the special set-up of the trial. Rather, the outcome of the study suggests that an extension of opening hours need not aggravate harm if the extension is conditioned on a simultaneous strengthening of efficient preventive measures.


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