

Assessing the overprovision of Alcohol Licenses in Edinburgh: Report to City of Edinburgh Licensing Board

Jim Sherval BSc MSc FFPH
Specialist in Public Health
NHS Lothian

Acknowledgements:

NHS Lothian: Eilidh Fletcher, Mette Tranter, Hannah Waite
Lothian and Borders Police: Alison Mitchell
Lothian and Borders Fire and Rescue Service: David Lockhart
Edinburgh Licensing Standards Team
Depute Clerks to the Licensing Board

Literature review by Michelle Irvine, Public Health MSc Student at Queen
Margaret University

Contents

1. Introduction	2
2. How many licensed premises are there in Edinburgh?	4
3. What locality to use?	5
4. What statistics are of interest?	5
a. Alcohol consumption and dependence.....	5
b. Alcohol related deaths and Alcohol related hospital admissions	5
c. Alcohol related admissions	7
d. Police data.....	8
e. Fire data	9
4. What does the academic literature say?	11
5. How have other Boards tackled overprovision?	13
6. Conclusion	14

1. Introduction

While there is no nutritional need for human beings to consume alcohol it has become a culturally and economically important substance while at the same time accounting for a great deal of harm.

The Scottish Government's strategyⁱ is a population approach to lower the per capita consumption of alcohol.

“Scotland is drinking too much. We believe excessive consumption directly causes harm and that legislative action is needed urgently to reduce overall consumption in the Scottish population, by making alcohol less easily accessible and, given its potential to be a harmful product, through controlling its promotion by retailers.”ⁱⁱ

This strategy is based on evidence that points to a close connection between average or median alcohol consumption and heavy or problem drinkingⁱⁱⁱ. In short, if we all drink less the burden of alcohol related harm in the population will reduce.

By pursuing the five principles enshrined in the Licensing (Scotland), Licensing Boards can contribute to the achievement of this overall strategy. One of the ways it can address public health and community safety concerns is through consideration of overprovision.

An assessment of overprovision has already been made in Edinburgh and an area exists. In the Licensing Board Statement of Licensing Policy adopted 22 Nov 2010 it states that there is a

“Presumption against the grant of any further licenses” in Grassmarket, Cowgate and streets leading into”

It goes on to say that,

“Other areas exhibiting factors associated with an overprovision of licenses” listed:

- Lothian Road/ Princes St, George St
- Greenside Place/ Picardy Place
- Market St
- Central Leith

In the statement the Board expresses concern expressed at the high number of off sales premises and intends to examine any application to assure itself that the application will not undermine the licensing objectives

The City of Edinburgh Licensing Board Policy Statement 2010 sets out the Boards intention to do further work on overprovision.^{iv} It asks two questions.

- Are there too many licensed premises in Edinburgh or localities within Edinburgh?

- Are there too many licensed premises of a particular type in Edinburgh or localities within Edinburgh?

This is a direct reflection of the Licensing (Scotland) Act 2005 section 7.^v

Duty to assess overprovision

(1) Each licensing policy statement published by a Licensing Board must, in particular, include a statement as to the extent to which the Board considers there to be overprovision of—

- (a) licensed premises, or
- (b) licensed premises of a particular description,

in any locality within the Board's area.

(2) It is for the Licensing Board to determine the "localities" within the Board's area for the purposes of this Act.

(3) In considering whether there is overprovision for the purposes of subsection (1) in any locality, the Board must—

- (a) have regard to the number and capacity of licensed premises in the locality, and
- (b) consult the persons specified in subsection (4).

(4) Those persons are—

- (a) the appropriate chief constable,
- (b) such persons as appear to the Board to be representative of the interests of—
 - (i) holders of premises licences in respect of premises within the locality,
 - (ii) persons resident in the locality, and
- (c) such other persons as the Board thinks fit.

(5) In this section, references to "licensed premises" do not include references to any premises in respect of which an occasional licence has effect.

2. How many licensed premises are there in Edinburgh?

Edinburgh has 1,830 licenses which translates to a rate of 42.8 licenses per 10,000 population aged over 18. The last publicly available figures for Scotland are for 31st December 2007.^{vi} This states the Scottish rate as 42.0 licenses per 10,000 population aged over 18. However, this is a crude headline figure and does not convey the variety of licenses.

The majority of drinking takes place at home using off-sales. Analysis of industry sales data shows that 50.9 million litres of pure alcohol were sold in Scotland in 2009^{vii}. Within that figure approximately two thirds (**68%**, 34.4 million litres) of the total volume of pure alcohol sold in Scotland in 2009 was sold through the **off-trade** compared with approximately one third (32%, 16.5 million litres) through the on-trade^{viii}. The majority of spirits (76%), light wine (85%) and cider (69%) was sold off-trade. Beer was the only category of drink for which the majority of alcohol was sold through the on-trade (55%).

Types of Licence

The Licensing Board has supplied a database of all licenses in Edinburgh with a one line description of the premises. An analyst at NHS Lothian has attempted to categorise this description and table below gives the breakdown of licenses for Edinburgh. This is a work in progress and there will be some further tidying up required.

Table : Alcohol Licenses in Edinburgh by Type, August 2011

<i>Venue type</i>	<i>Total</i>
Adult Entertainment	5
Cafe	34
Convenience Store	243
Hostel/Backpackers	5
Hotel	146
Multipurpose venue	21
Nightclub	33
Off sales	63
Other	56
Other retail	40
Pub/Bar	428
Restaurant	449
Social Club/Sports Club/Private Members Club	160
Supermarket	85
Takeaway	21
Grand Total	1816

3. What locality to use?

Locality is not defined in the Act and is up to Boards to define. One Board has defined their entire area as a locality and looked at sub localities within it. There are several options which could be used in combination depending on the statistic of interest.

Data Zone - There are 6505 data zones in Scotland created by combining 2001 Census output areas. Data Zones have populations of between 500 and 1,000 household residents and some effort has been made to respect physical boundaries. In addition, they have compact shape and contain households with similar social characteristics.

Intermediate Geography - There are 1,235 intermediate zones in Scotland created by aggregating up data zones within local authorities. Intermediate zones have populations of between 2,500 and 6,000 household residents. The intermediate geography has been introduced as it is clear that not all statistics are suitable for release at the data zone level because of the sensitive nature of the statistics or for reasons of reliability and it was apparent that a statistical geography between data zone and local authority was required.

Multi-member ward –The multi member electoral wards are for returning 3 or 4 council members by Single Transferable Vote Proportional Representation as required by the Local Governance (Scotland) Act 2004. There are 17 in the City.

Neighbourhood Partnership area – there are 12 in the City that form part of the community planning structure.

4. What statistics are of interest?

a. Alcohol consumption and dependence¹

It is estimated that there are **20,685** alcohol dependent people in Edinburgh using 2010 population estimates and the work of the Scottish Alcohol Needs Assessment project that estimated 5% (4.6-5.4) of those 16 years and older as alcohol dependent^{ix}. However, it is not possible to map these estimates at a level below the City.

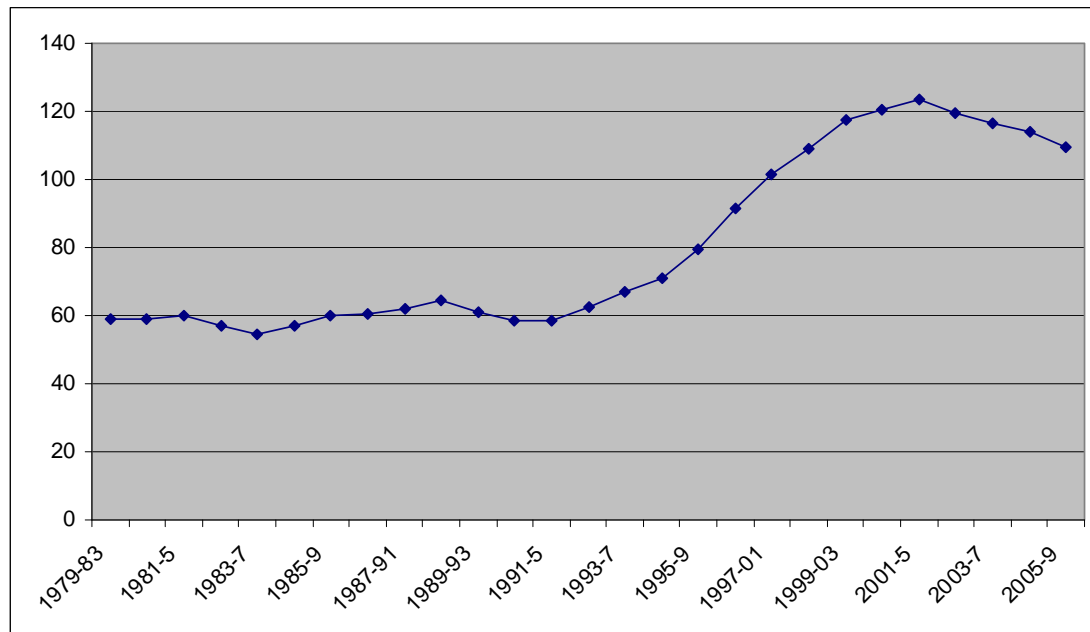
b. Alcohol related deaths and Alcohol related hospital admissions

These can be mapped at lower levels. Hospital admissions being frequent enough to map at Intermediate geography level.

¹ Defined by WHO as an individual having three or more of a range of symptoms of alcohol dependence including: tolerance, alcohol withdrawal, craving, relief of withdrawal, neglect of alternative pleasures, and persistence of drinking despite negative consequences.

Edinburgh experienced a rapid increase in deaths in its residents directly due to alcohol during the late 90s and early 2000s. Figure 1 below shows that through the 1980s direct alcohol related deaths averaged about 60 residents per year. This had doubled to 120 by the millennium. The actual peak was in 2005 with 139 deaths. There has now been a slight tailing off from this peak. There were 94 alcohol related deaths in 2009.

Figure 1. Alcohol related deaths in City of Edinburgh Residents, 1979 to 2009, five year rolling averages



Source: GROS

The figures reported here are based on a narrow range of causes of death where alcohol is 100% contributory. It has been calculated that at a Scottish level this figure can be doubled to include the total number of deaths where alcohol was a contributory factor (e.g. certain cancers, CHD, stroke, hypertension etc)^x. Nevertheless, this definition is useful for monitoring trends.

In Edinburgh approximately 4000 people die each year so while alcohol related deaths are a small proportion of this total they occur disproportionately in premature deaths (deaths below age 65 years of age). Table 1 below gives the top ten most frequently occurring individual causes of death in this age group as a percentage of the total.

Table 1 Premature mortality: 10 most frequently occurring individual causes of death under 65 years, Edinburgh city, 2007-2009

<i>Primary Cause of Death</i>	<i>Percent</i>
Malignant neoplasm of bronchus and lung	8.1
Chronic ischaemic heart disease	6.7
Acute myocardial infarction	5.7
Alcoholic liver disease	5.5
Other ill-defined and unspecified causes of mortality	4.5
Malignant neoplasm of breast	3.1
Intentional self-harm by hanging, strangulation and suffocation	2.7
Other chronic obstructive pulmonary disease	2.6
Mental and behavioural disorders due to use of alcohol	2.0
Mental/behav disorders due to mult drug & other psychoactive subst use	1.9

Source: GRO Scotland.

Data extracted August 2011.

c. Alcohol related admissions

The Forum has already seen data on alcohol related admissions. Table 2 below shows the 20 intermediate zones in Edinburgh with the highest rates of alcohol hospital admissions.

Table 2: Alcohol hospital admissions 2007-2009, highest quintile of intermediate zones by rate per 10,000 population and indexed against Edinburgh

<i>IZ Name</i>	<i>rate per 10,000 pop</i>
Greendykes and Niddrie Mains	215.32
Niddrie	201.28
Restalrig and Lochend	195.96
Clovenstone and Drumbryden	187.80
Bingham, Magdalene and the Christians	185.78
Muirhouse	183.35
Gracemount, Southouse and Burdiehouse	180.46
Calders	174.25
Waterfront and Granton	172.02
Southside and Canongate	169.90
Old Town and Leith Street	168.71
Broomhouse and Sighthill	168.21
North Leith and Newhaven	163.94
South Leith	155.35
Great Junction Street	153.73
Moredun	152.93
Bonnington and Pilrig	151.91
Lorne	148.47
West Pilton	142.33
The Inch	140.85

d. Police data

Lothian and Borders Police have supplied three sources of information. All crime and incident data has been extracted from Lothian and Borders Police Crime and Incident recording systems for the fiscal year 2010/11.

Three different data sets have been used:

- alcohol offences,
- offences with an alcohol aggravator and
- STORM incidents relating to alcohol.

STORM is Lothian & Borders Police command and control system.

There were 357 alcohol offences in the City of Edinburgh. 85% of alcohol offences relate to drunk and incapable and urinating.

Offences with an alcohol aggravator are where an alcohol marker is added to crime reports where the reporting officer is of the opinion that alcohol is a contributory factor in the crime. Consideration therefore has to be given to the subjective nature of recording such incidents and the potential for inconsistencies.

There were 4523 such offences in Edinburgh. 55% of offences with alcohol aggravators are minor assaults and breach of the peace.

There is no specific incident code related to alcohol therefore the incident description field in STORM was searched for references to alcohol. There were 347 STORM incidents.

Consideration was given to the potential for duplicate crimes and incidents for example, where an alcohol offence was also recorded with an aggravator. Such records were only included in the offences category and removed from the aggravator dataset.

Comparisons between Health and Crime Data

Areas of Edinburgh (intermediate zones) have been compared in terms of their rankings by health data (alcohol related hospital admissions) and crime data (offences with an alcohol aggravator). There are 101 intermediate zones in Edinburgh. Thus the top 20 zones will also be the highest quintile.

The following areas appear in the top 20 (or quintile) for **both** health and crime data sets.

- Bonnington and Pilrig
- Broomhouse and Sighthill

- Calders
- Clovenstone and Drumbryden
- Great Junction Street
- Greendykes and Niddrie Mains
- Longstone and Saughton Mains
- Lorne
- Muirhouse
- Old Town and Leith Street
- Southside and Canongate
- Waterfront and Granton

Areas in the highest quintile on the crime data set but **not** the health data are as follows.

- Hyvots and Gilmerton Dykes
- Jewel, Brunstane and Newcraighall
- Leith Docks
- Meadows
- Portobello
- South Queensferry (East) and Dalmeny
- South Queensferry West
- Tollcross

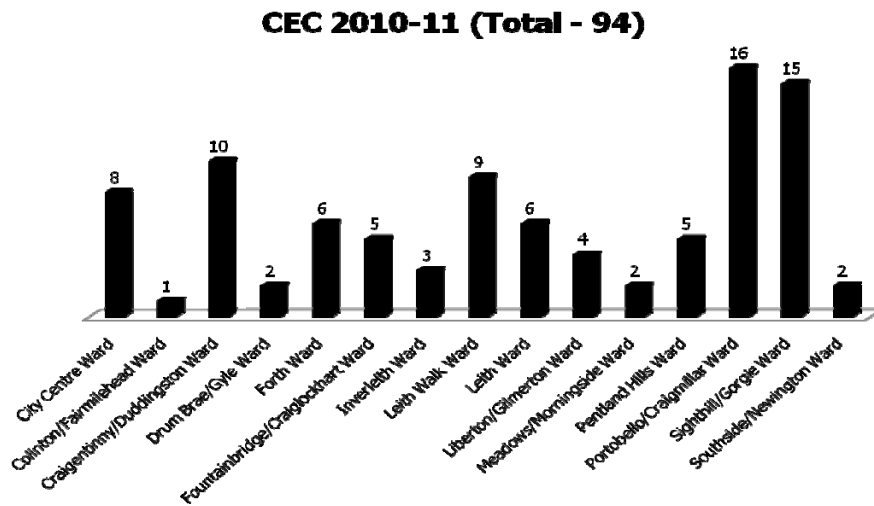
Areas in the highest quintile on the health data set but **not** the crime data are as follows.

- Bingham, Magdalene and the Christians
- Gracemount, Southouse and Burdiehouse
- Moredun
- Niddrie
- North Leith and Newhaven
- Restalrig and Lochend
- South Leith
- The Inch
- West Pilton

e. Fire data

Lothian and Borders Fire and Rescue Service collect incidents where the officer completing the IRS has selected that the person(s) involved were suspected under the influence of alcohol or drugs. Approximately 90% of the incidents are alcohol related. In Edinburgh, from:01/04/2010 to 31/03/2011 there were 94 alcohol and drug related incidents with 73 Fatalities, Casualties or Rescues (1 fatality, 32 hospital treatment, 23 treated at scene, 17 rescue only).

Figure 2 Alcohol and Drug related Fire Incidents in Edinburgh, by ward 2010-11

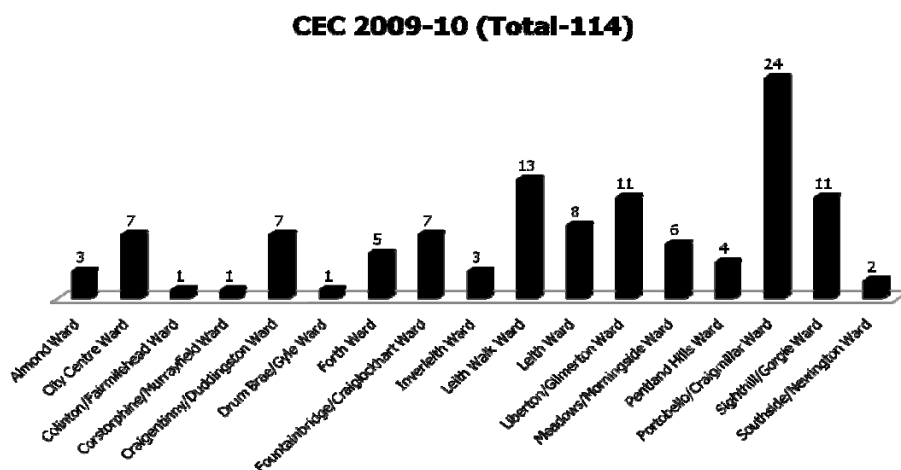


Source: Lothian and Borders Fire Rescue Service

Figure 3 below gives the same data for the year 2009-10 and shows a total of 114 fires related to alcohol and drugs.

Figure 3: Alcohol and Drug related Fire Incidents in Edinburgh, by ward 2009-10

Source: Lothian and Borders Fire Rescue Service



4. What does the academic literature say?

Recent trends have seen an increase in alcohol consumption influenced by declining costs, increased availability and changing cultural attitudes^{xi}. In particular, the number of licensed premises within a certain area (alcohol outlet density) is thought to increase overall consumption and alcohol related harm. There is a growing body of academic evidence to suggest that increasing the availability of alcohol within a community has significant effects on alcohol-related outcomes and behaviours.

Alcohol outlet density is related to increases in a range of alcohol-related harms. A greater number of alcohol outlets were significantly related to the number of alcohol-related hospital admissions in a California-based study^{xii}. In Sweden, a decrease in the density of establishments selling beer significantly decreased alcohol-related hospitalisation among youths aged 10-19, although there was no statistically significant effect on other age groups^{xiii}. In Los Angeles a dramatic decrease in the density of alcohol outlets following civil unrest led to a reduction in the number of cases of sexually transmitted infections^{xiv}. Also in California, a number of studies investigated the relationship between AOD and child abuse and neglect, demonstrating that the number of off-sales outlets had a positive effect on the rate of child abuse and the number of on-sales outlets had a positive effect on the rate of child neglect^{xv}. Areas with increased local bars and off-sales establishments were also correlated with higher levels of foster care placements^{xvi}.

Outlet density is also positively related to hospitalisation or mortality from road accidents. Higher AOD was found to be significantly related to higher levels of drinking and driving among youth, in particular among the youngest drivers and females, with no difference found between types of alcohol outlets^{xvii}. In San Francisco, the number of on-sales licences per kilometre of road was significantly and positively related to the number of alcohol-involved pedestrian collisions^{xviii}. In separate studies in California it was found that a 10% increase in AOD was associated with a 3% increase in incidents of driving under the influence of alcohol^{xix}, with on-sales alcohol establishments in particular associated with greater incidents of driving while intoxicated^{xx}.

The most established relationship in the academic literature is the relationship between alcohol outlet density (AOD) and violence, with the majority of the evidence suggesting an increase in violence is related to an increase in the number of alcohol outlets. Research in the United States and Australia has found that greater AOD is associated with increased rates of violent crime^{xxixxxiixxlixxiv}. This relationship is true when controlling for other social factors such as household income^{xxvxxvi}. There is also an evidence base to suggest a positive relationship between alcohol outlet density and increased consumption of alcohol. A Canadian examination of the relationship between alcohol cirrhosis mortality, alcohol consumption and the availability of alcohol concluded that alcohol consumption was significantly impacted by increased availability^{xxvii}. Similar results were found in New Zealand, with a positive

association found between AOD and increased individual alcohol consumption, independent of socioeconomic factors^{xxviii}. The Canadian and New Zealand results were similar to three older United States based studies, all of which indicated increased AOD was positively associated with increased consumption^{xxixxxxxxxxxxi}.

An emerging area of research is the relationship between alcohol outlet density and youth consumption. In youth aged 14-16 in California, an increase in youth access to alcohol measured by alcohol outlet density increased overall consumption^{xxxii}. A second study in 2010 also found higher levels of drinking among youths when measuring alcohol outlet density by zip codes in California^{xxxiii}. Similar findings have been found in New Zealand, investigating consumption of alcohol among youth aged 12-17. A greater density of alcohol outlets was again found to be a significant indicator of increased consumption among young drinkers, with larger quantities of alcohol consumed by youth living within a 10 minute drive of more alcohol outlets^{xxxiv}.

Similar results have been found in studies examining university aged students in the United States and New Zealand. A study of university aged students in the US showed a strong correlation between outlet density and problem drinking among all student drinkers, regardless of subgroup (male, female, began binge drinking in university)^{xxxv}. These results were also demonstrated in a New Zealand based study of six university campuses. However, this study was unique in that it found a difference between consumption and type of alcohol outlet, with off-sales licenses in particular found to be related to increased consumption and alcohol-related harm^{xxxvi}.

The density of certain types of alcohol outlets has been shown to have some relationship with alcohol-related harm. In California, the density of on-sales and off-sales alcohol outlets were compared to hospital discharge data for violent crimes, with a significant relationship found between the two. A 10% increase in bars (on-sales) led to a 2.06% increase in violence while a 10% increase in off-sales establishments led to a 1.67% increase in violence^{xxxvii}. In New South Wales, Australia, a significant relationship was found between overall alcohol sales and the incidence of assault in both urban and rural locations^{xxxviii}. Although only overall alcohol sales were significantly related to assault in Sydney, the majority of assaults in rural New South Wales were associated with hotels and off-sales establishments. Similar findings were found in a later Australian study, suggesting a significant relationship between AOD and assault rates, with greater effects seen in those who had been drinking in hotels^{xxxix}.

Increased densities of off-sales establishments were found to be associated with greater rates of assault in California, while on-sales were not. However, greater densities of on-sales establishments were related to violence in poor minority areas and rural middle-class areas of California^{xl}. Despite the evidence suggesting type of outlet is associated with violence, the evidence examining type of establishment and consumption is limited. The majority of research investigating AOD and consumption does not distinguish between

the different types of outlets and licenses, thus additional research into this would be highly beneficial.

5. How have other Boards tackled overprovision?

West Dunbartonshire^{xli}

West Dunbartonshire have done an analysis, held a consultation and incorporated a comprehensive overprovision statement in their licensing policy. The following is an extract from West Dunbartonshire's Licensing Policy.

23. The Board, having examined data regarding rates of alcohol related death, alcohol related hospital admissions, police incidents, crime and fire statistics and information regarding the number, type and capacities of licensed premises in localities within West Dunbartonshire, having regard to evidence of a correlation between the density of outlets and alcohol related problems, having regard to its duty to promote the licensing objectives and having undertaken a consultation exercise is of the view that there is overprovision of certain types of licensed premises in a locality within West Dunbartonshire.

24. The Board considers there to be overprovision of the following types of licensed premises namely:-

- Vertical drinking establishments (i.e. where the majority of capacity is for patrons standing up to drink as opposed to premises which cater predominately for persons taking meals – this includes pubs but will also include hotels where the bar facilities are not ancillary to the accommodation or dining).
- Nightclubs
- Off-sales and local convenience stores
- Supermarkets

25. The Board considers there is an overprovision of these types of licensed premises in a locality within West Dunbartonshire comprising ...15 sub-localities

28. There are 3 sub-localities within West Dunbartonshire where the board considers that there is not presently overprovision of licensed premises.

The Board is aware that some of these sub localities are in close proximity to areas with significant alcohol related health, crime and disorder problems. The Board is also aware that there is local evidence to suggest that persons in West Dunbartonshire, wishing to obtain alcohol from off-licences **will travel up to two miles** across sub-localities to purchase alcohol. Similarly persons will travel across the whole of West Dunbartonshire to attend nightclubs. Accordingly any application outwith the overprovision locality for new premises or increased capacity of existing premises where there is a likelihood that customers will be drawn from the Board's overprovision locality will also be subject to an overprovision assessment. This assessment will

have regard to the alcohol related crime, disorder and health data relating to both the sub locality in which the application premises are located and the sub localities from where the customers are likely to be drawn.

The West Dunbartonshire Policy concludes with a “**rebuttable presumption**” against the grant of an application for the types of premises outlined. The policy goes on to say that each application requires to be determined on its own merits and there may be “exceptional cases” where an applicant can persuade the Board that there is case to grant. However, the Board seek robust and reliable evidence from the applicant.

6. Conclusion

The analysis of health and crime data highlights areas in Edinburgh that experience different types of alcohol related problems.

The ability to map different types of licence provides the opportunity to target certain types of license that may contribute disproportionately to increased levels of alcohol consumption and its associated problems and harms.

If the current area of overprovision is to be extended or other areas in the city declared overprovided for certain types of licence the extent of the area will need to be very well defined. In short, it will need the naming of individual streets.

The existing zone focuses on particular ‘problem’ streets where the licensed premises are. This has a number of downsides including focusing in the main on antisocial behaviour related to premises rather than more longer term health impacts for the surrounding population.

The maps presented along with this report suggest that extending an area of overprovision beyond the streets where the premises are located is important in preventing further alcohol related problems in the areas concerned.

References

- ⁱ Scottish Government (2009), Changing Scotland's relationship with alcohol: a framework for action, Scottish Government: Edinburgh <http://www.scotland.gov.uk/Publications/2009/03/04144703/0>
- ⁱⁱ Scottish Government (2009) paragraph 31.
- ⁱⁱⁱ Academy of Medical Sciences (2004) Calling time: the Nation's drinking as a major health issue. London: The Academy of Medical Sciences <http://www.acmedsci.ac.uk/p99puid20.html>
- ^{iv} Edinburgh Licensing Board Statement 2010
http://www.edinburgh.gov.uk/downloads/download/1144/licensing_board_policy_statement_2010
- ^v Licensing (Scotland) Act 2005 <http://www.legislation.gov.uk/asp/2005/16/section/7>
- ^{vi} The Scottish Government (2008), Scottish liquor licensing statistics, 2007, Statistical Bulletin Crime and Justice Series, Edinburgh: Office National Statistics for Scotland.
2008 <http://www.scotland.gov.uk/Topics/Statistics/Browse/Crime-Justice/PubLiquor/Q/EditMode/on/ForceUpdate/on>
- ^{vii} Robinson M, Catto S, Beeston C. *Monitoring and Evaluating Scotland's Alcohol Strategy (MESAS): Analysis of alcohol sales data, 2005-2009*. Glasgow: NHS Health Scotland; July 2010. www.healthscotland.com/documents/3974.aspx
- ^{viii} Catto S, Robinson M, Beeston C, Gruer L. *A descriptive analysis of price band data for alcohol sold through the off-trade, Scotland 2009*. Glasgow: NHS Health Scotland; 2010. <http://www.healthscotland.com/uploads/documents/13139-descriptiveAnalysisPriceBandDataAlcoholSoldOff-tradeScotland09.pdf>
- ^{ix} Estimates for alcohol dependence are for Lothian, Borders and Fife combined - see Drummond et al (2009), Scottish Alcohol Needs Assessment, Institute of Psychiatry, King's College London: London http://www.alcoholinformation.isdscotland.org/alcohol_misuse/files/SANA.pdf
- ^x Grant I, Springbett, Graham L (2009), Alcohol attributable mortality and morbidity: alcohol population attributable fractions for Scotland. Edinburgh:ISD & ScotPHO.
<http://www.scotpho.org.uk/alcoholPAFreport/>
- ^{xi} Scottish Government. 2008. *Changing Scotland's relationship with alcohol: a discussion paper on our strategic approach*. [online] Edinburgh: Scottish Executive. Available from: <http://www.scotland.gov.uk/Resource/Doc/227785/0061677.pdf> [Accessed September 29 2011].
- ^{xii} Tatlow, J. R., Clapp, J. D., and Hohman, M. M. 2000. The relationship between the geographic density of alcohol outlets and alcohol-released hospital admissions in San Diego County. *Journal of Community Health*, 25 (1) pp. 79-88.
- ^{xiii} Ramstedt, M. 2002. The repeal of medium-strength beer in grocery stores in Sweden – the impact on alcohol-related hospitalisations in different age groups. Finland Nordic Council for Alcohol and Drug Research (NAD), No 42.
- ^{xiv} Cohen, D. A., Ghosh-Dastidar, B., Scribner, et al. 2006. Alcohol outlets, gonorrhoea and the Los Angeles civil unrest: a longitudinal analysis. *Social Science and Medicine*, 62 pp.3062-3071.
- ^{xv} Friesthler, B., Midanik, L. T., and Gruenewald, P. J. 2004. Alcohol outlets and child physical abuse and neglect: applying routine activities theory to the study of child maltreatment. *Journal of Studies on Alcohol*, 65 pp. 586-592.
- ^{xvi} Freisthler, B., Gruenewald, P. J., Remer, L. G., Lery, B., and Needell, B. 2007. Exploring the spatial dynamics of alcohol outlets and child protective services referrals, substantiations, and foster care entries. *Child Maltreatment*, 12 (2) pp. 14-124.
- ^{xvii} Treno, A. J., Grube, J. W., and Martin, S. E. 2003. Alcohol availability as a predictor of youth drinking and driving: a hierarchical analysis of survey and archival data. *Alcoholism: Clinical and Experimental Research*, 27(5) pp. 835-840.
- ^{xviii} LaScala, E. A., Gerber, D. and Gruenewald, P. J. 2000. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. *Accident Analysis and Prevention*, 32 pp. 651-658
- ^{xix} Gruenewald, P. J., Johnson, F. W., and Treno, A. J. 2002. Outlets, drinking and driving: a multi-level analysis of availability. *Journal of the Study of Alcohol*, 63(4) pp. 468-468.
- ^{xx} McCarthy, P. 2003. Alcohol-related crashes and alcohol availability in grass-roots communities. *Appl Econ*, 35 (11) pp. 1331-1338.
- ^{xxi} Gorman, D. M., Speer, P. W., Gruenewald, P. J et al. 2001. Spatial dynamics of alcohol availability, neighbourhood structure and violent crime. *Journal of the Study of Alcohol*, 62 pp.628-636.
- ^{xxii} Zhu, L., Gorman, D. M., and Horel, S. 2004. Alcohol outlet density and violence: a geospatial analysis. *Alcohol and Alcoholism*, 39 (4) pp. 369-375.

-
- ^{xxiii} Gruenewald, P. J., Friesthler, B., Remer, L., LaScala, E. A., and Treno, A. 2006. Ecological models of alcohol outlets and violent assaults: crime potentials and geospatial analysis. *Addiction*, 101 pp. 666-677.
- ^{xxiv} Livingston, M. A longitudinal analysis of alcohol outlet density and assault. *Alcoholism: Clinical and Experimental Research*, 32 (6) pp. 1074-1079.
- ^{xxv} Gorman, D. M., Speer, P. W., Gruenewald, P. J et al. 2001. Spatial dynamics of alcohol availability, neighbourhood structure and violent crime. *Journal of the Study of Alcohol*, 62 pp.628-636.
- ^{xxvi} Gruenewald, P. J., Friesthler, B., Remer, L., LaScala, E. A., and Treno, A. 2006. Ecological models of alcohol outlets and violent assaults: crime potentials and geospatial analysis. *Addiction*, 101 pp. 666-677
- ^{xxvii} Xie, X., Mann, R. E., and Smart, R. G. 2000. The direct and indirect relationships between alcohol prevention measures and alcoholic liver cirrhosis mortality. *Journal of Studies on Alcohol*, 61 pp. 499-506.
- ^{xxviii} Connor, J. L., Kypri, K., Bell, M. L., and Cousins, K. 2011. Alcohol outlet density, levels of drinking and alcohol-related harm in New Zealand: a national study. *Journal of Epidemiology and Public Health*, 65 pp. 841-846.
- ^{xxix} Gruenewald, P.J., Millar, A. B., Treno, A. J., Yang, Z., Ponicki, W. R., and Roeper, P. 1996. The geography of availability and driving after drinking. *Addiction*, 91 (7) pp. 967-983.
- ^{xxx} Hoadley, J. F., Fuchs, B. C., and Holder, H. D. 1984. The effect of alcohol beverage restriction on consumption: a 25 year longitudinal analysis. *American Journal of Drug and Alcohol Abuse*, 10 (3) pp. 375-401.
- ^{xxxi} McCornac, D. C., and Filante, R. W. 1984. The demand for distilled spirits: an empirical investigation. *Journal of the Study of Alcohol*, 45 (2) pp.176-178.
- ^{xxxii} Chen, M., Gruenewald, P. J., and Remer, L. G. 2009. Does alcohol outlet density affect youth access to alcohol? *Journal of Adolescent Health*, 44 (6) pp. 582-589.
- ^{xxxiii} Chen, M., Grube, J. W. and Gruenewald, P. J. 2010. Community alcohol outlet density and underage drinking. *Addiction*, 105 (2) pp. 270-278.
- ^{xxxiv} Huckle, T., Huakau, J., Sweetsur, P., Huisman, O., and Casswell, S. Density of alcohol outlets and teenage drinking: living in an alcogenic environment is associated with higher consumption in a metropolitan setting. *Addiction*, 103 (10) pp. 1614-1621.
- ^{xxxv} Weitzman, E. R., Folkman, A., Folkman, K. L., and Weschler, H. 2003. The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health and Place*, 9 pp. 1-6.
- ^{xxxvi} Kypri, K., Bell, M. L., Hay, G. C., and Baxter, J. 2008. Alcohol outlet density and university student drinking: a national study. *Addiction*, 103 (7) pp. 1131-1138.
- ^{xxxvii} Gruenewald and Remer 2006
- ^{xxxviii} Stevenson, R., Lind, B., and Weatherburn, D. 1999. The relationship between alcohol sales and assaults in New South Wales Australia. *Addiction*, 94 (3) pp. 397-410.
- ^{xxxix} Livingston, M. A longitudinal analysis of alcohol outlet density and assault. *Alcoholism: Clinical and Experimental Research*, 32 (6) pp. 1074-1079.
- ^{xl} Gruenewald, P. J., Friesthler, B., Remer, L., LaScala, E. A., and Treno, A. 2006. Ecological models of alcohol outlets and violent assaults: crime potentials and geospatial analysis. *Addiction*, 101 pp. 666-677
- ^{xli} West Dunbartonshire's Licensing Board papers are here <http://www.west-dunbarton.gov.uk/law-and-licensing/licensing/licensing-board/>