

# Evaluation of alcohol outlet density and its relation with violence

## Avaliação da densidade de pontos de vendas de álcool e sua relação com a violência

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### Keywords

Alcoholic beverages. Violence.  
Commerce. Metropolitan zones.  
Poverty areas. Public health.

### Abstract

#### Objectives

The current study set out to investigate alcohol availability in a densely populated, residential area of suburban São Paulo associated with high levels of social deprivation and violence. Gun-related deaths and a heavy concentration of alcohol outlets are notable features of the area surveyed. Given the strong evidence for a link between alcohol availability and a number of alcohol-related problems, including violent crime, measures designed to reduce accessibility have become a favored choice for alcohol prevention programs in recent years.

#### Methods

The interviewers were 24 residents of the area who were trained for the study. It was selected an area of nineteen streets, covering a total distance of 3.7 km. A profile of each alcohol outlet available on the area was recorded.

#### Results

One hundred and seven alcohol outlets were recorded. The number of other properties in the same area was counted at 1,202. Two measures of outlet density may thus be calculated: the number of outlets per kilometer of roadway (29 outlets/km); and the proportion of all properties that sold alcohol (1 in 12).

#### Conclusions

The results of this study is compared with others which are mainly from developed countries and shown that the area studied have the highest density of alcohol outlet density ever recorded in the medical literature. The implication of this data related to the violence of the region is discussed. By generating a profile of alcohol sales and selling points, it was hoped to gain a better understanding of alcohol access issues within the sample area. Future alcohol prevention policy would be well served by such knowledge.

### Descritores

*Bebidas alcoólicas. Violência.  
Comércio. Zonas metropolitanas.  
Áreas de pobreza. Saúde pública.*

### Resumo

#### Objetivos

*Devido às fortes evidências de ligação entre disponibilidade de álcool e números de problemas a ele relacionados, inclusive crimes violentos, medidas para reduzir o acesso ao álcool têm sido escolhidas em programas de prevenção. Ao obter informações sobre as vendas de álcool e os locais de venda, buscou-se investigar a disponibilidade de bebidas alcoólicas em uma região densamente povoada e melhorar*

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*o entendimento sobre o acesso a essa substância, para que ações preventivas futuras possam beneficiar-se dessas informações.*

#### **Métodos**

*O estudo foi realizado em uma região do Município de São Paulo, SP, Brazil. Foram treinados 24 entrevistadores, moradores da região, para fazerem a coleta de dados. Foi selecionada uma área de 19 ruas, cobrindo uma distância de 3.7 km. Foi feito um perfil de cada ponto de venda de bebidas alcoólicas dessa região.*

#### **Resultados**

*Foram registrados 107 pontos de venda de álcool. O número de outras propriedades nessa região foi de 1.202. Duas medidas de densidade de pontos de venda podem ser calculadas: número de pontos de venda por quilômetro de rua (29 pontos/km) e proporção de todas as propriedades de venda de álcool (1 em 12).*

#### **Conclusões**

*Comparado a estudos internacionais principalmente de países desenvolvidos, a área estudada tem a mais alta densidade de pontos de vendas de álcool registrada na literatura médica. As informações sobre as vendas de álcool e os locais de venda contribuíram para melhorar o entendimento do acesso ao álcool na região estudada. Ações preventivas futuras poderão beneficiar-se dessas informações.*

## INTRODUCTION

The accessibility – or availability – of retail alcohol may be thought of as the ease or difficulty with which it can be obtained. Influencing factors include the number of outlets selling alcohol, licensing laws limiting business days and hours, minimum drinking age, clients' disposable income and beverage pricing. A wide range of restrictive policies designed to limit the availability of alcohol have been introduced over the years in the hope of decreasing both consumption and the incidence of alcohol-related problems.<sup>16</sup>

There is now a growing body of evidence that alcohol availability is related to rates of alcohol consumption,<sup>4</sup> and the emergence of alcohol-related problems.<sup>5</sup> For example, consumption has been shown to be influenced by price changes,<sup>2</sup> while increases to the minimum drinking age in many US states have been accompanied by decreases in drinking rates and drinking problems among 18-20 year olds.<sup>17</sup>

Increasingly, researchers have concentrated on outlet density as a general measure of physical availability of alcohol. Several studies support a geographic link between outlet density and a number of alcohol-related problems, including alcoholism rates,<sup>6</sup> cirrhosis mortality,<sup>7</sup> violent crime (namely homicide, rape, assault, and robbery),<sup>12</sup> drunk driving arrests,<sup>7</sup> traffic injuries and crashes,<sup>5</sup> and high-risk sexual behavior.<sup>12</sup>

Few researchers would argue that availability alone accounts for variation in rates of alcohol-related problems. The studies mentioned above generated statistically significant results after controlling for a variety of sociodemographic variables

and confounding effects of characteristics such as poverty, unemployment, population size, age, and gender structure are widely acknowledged. For example, Scribner et al<sup>12</sup> (1995) found in an analysis of 74 cities within Los Angeles County, sociodemographic factors alone accounted for 70% of variance in the rate of assaultive violence, although 7% of this variability could be explained by outlet density. The policy implications of the studies cited in this introduction are that any regulation of the density of alcohol outlets could beneficially reduce alcohol-related problems. Even if sociodemographic measures are more powerful predictors of alcohol problems, setting up limits on outlet density is a more achievable goal for community policy makers than, say, reductions in unemployment or poverty.

With respect to violence the evidence is particularly compelling. Roncek & Maier<sup>11</sup> (1991) studied the effects of bars and taverns on crime on residential city blocks in Cleveland. They found the risk of having a violent crime on a block rose by 17.6% with every additional bar or tavern. Speer et al<sup>14</sup> (1998) highlight the importance for policy making to recognize the magnitude of alcohol outlet densities' influence on violent crime. Their results showed that a reduction in violence which could be achieved by a 1% decrease in alcohol outlet density would require a 5% increase in median household income or an 8% increase in employment. They also point out that outlet density was more strongly predictive of violent crime at the immediate, neighborhood level than at municipal levels. This would suggest that efforts to reduce violence through restrictions on alcohol availability may be most effective at the local community level.

There is scarcity of data about the impact of alcohol in developing countries. A recent review sponsored by Riley<sup>10</sup> (1999) highlighted the lack of good scientific data about drinking that can be drawn on for policy purposes. In Brazil there are few scientific data discussing violence and alcohol. Minguardi et al<sup>8</sup> (1996) showed that alcohol may play a significant role in homicides in some areas of the city of São Paulo. After analyzing 1,549 police crime reports on homicide attempts or homicides during 1995 they showed that 90.6% of the victims were males aged between 16 and 30 years. The incident leading to the crime occurred between 20 and 24 hours mainly on weekends. Bar fights and alcohol were one of the main causes of the incidents.

The current study set out to investigate alcohol availability and a profile of alcohol sales and selling points in a densely populated, residential area of suburban São Paulo associated with high levels of social deprivation and violence. Gun-related deaths and a heavy concentration of alcohol outlets are notable features of the area surveyed. At the time the present study was carried out, a community drug and alcohol service was being developed for the region. By generating a profile of alcohol sales and selling points, it was expected to gain a better understanding of alcohol access issues within the sample area. Future alcohol prevention policy would be well served by such knowledge.

## METHODS

### Interviewers

The interviewers were 24 residents of *Jardim Ângela* and surrounding districts in city of São Paulo, Brazil, of whom 23 were training to be volunteer support staff for the a local community drug and alcohol service. Thirteen women and 11 men participated, ranging from 15 to 59 years of age (median age 30). Of the 20 who provided information on their educational history and present occupation, 7 were either university graduates, current university students or had at some point attended university. Three had completed secondary education, 6 had not completed secondary education and 4 were current secondary school students. Interviewers were divided into 12 pairs and trained in data gathering at the pilot stage.

### Sample

A study area was demarcated within the district of *Jardim Ângela*. The 12 pairs of participant interviewers surveyed 19 streets, covering a total distance of 3.7 km. There is no clean fit between the area studied

and available census data. A reliable measure of population size within the sample area is therefore unavailable. The survey was carried out between the hours of 10am and 2pm on Saturday November 21, 1998. The presence of any alcohol outlet within the sample area was recorded and those open for business were asked to participate in the study. Although the time of the interviews meant that several bars would be shut, *Jardim Ângela* is such a notoriously violent district that by restricting the survey to the morning it was hoped to reduce the chances of encountering alcohol-related "troubles" in the bars.

### Instruments

Three instruments were used to collect data. The first was simply a sheet of paper upon which interviewers kept a tally of the number of alcohol selling outlets and the number of other properties on each street surveyed. Such data could then be used to calculate the proportion of all properties that sold alcohol as one measure of outlet density. Another measure – the number of outlets per kilometer of roadway – could also be generated. The second instrument was a 47-item questionnaire, administered to the establishment owners or, in their absence, to whoever appeared to be in charge at the time of interview. Questionnaires were filled in by the interviewers and took about 15 minutes to be completed. Information was gathered on the following: owners and their reasons for opening the establishment; employees; quantities and types of beverage sold; opening hours; client profiles, including their drinking habits; take-away sales; and whether the outlet was licensed to sell alcohol. The main purpose of the third instrument was to get information about general characteristics of the place. The outlet's address and whether it was formal (a bar operating within designated premises) or informal (a shop, street stall or someone selling alcohol from their home) was recorded.

## RESULTS

Preliminary analysis of the questionnaires suggested that some of the interviewers were not fully aware of the importance of completing every questionnaire item. As a result a greater volume of missing data was returned than the project organizers anticipated. The outcome has been data of varying reliability and, consequently, only those variables believed to be the most reliable have been included in the final analysis.

A total of 19 streets, covering a total distance of 3.7 km, 107 alcohol outlets were recorded. The number of other properties in the same area was counted at

1,202. Two measures of outlet density may thus be calculated: the number of outlets per kilometer of roadway; and the proportion of all properties that sold alcohol. The first of these calculations is straightforward and yields a figure of 29 outlets per kilometer of roadway. The latter measure is less reliable because some of the outlets were street stalls and cannot be regarded as permanent properties. Although their exact number is unknown, interviewers said they had encountered only a handful over the course of the survey. When they are included in the calculation, the proportion of all properties that sold alcohol works out at approximately 1 in 12.

Data from all returned questionnaires were analyzed using descriptive statistics. The total sample size of outlet owner interviewed was 86, the interviews having been conducted within the original sample area of 19 streets. The number of refusals is unknown, as is the number of outlets closed at the time of the survey, due to incomplete data gathering by the interviewers. A rough estimate, based on available data and verbal reports from the interviewers themselves, is that respondents from two-thirds of the alcohol outlets recorded were interviewed.

### Profile of respondents

Sixty-three respondents (73.3%) were men and 23 (26.7%) were women. Seventy (81.4%) identified themselves as outlet owners or proprietors, while 16 (18.6%) said they were employees. Seventy-eight respondents (90.7%) lived in the area. Respondents ranged in age from 16 to 80 years and the mean age was 44.9 years ( $SD = 15.07$ ). The ages of outlet owners ranged from 18 to 80 years, the mean age being 47.7 years ( $SD = 14.01$ ; *missing*  $n=4$ ). Fifty-nine proprietors (84.3%) said they neither worked nor studied outside the establishment, 4 (5.7%) had a second job and 2 (2.9%) were also students (*missing*  $n=4$ ). The median amount of time that proprietors had worked in the establishment was 36 months (*range*: 1 month - 240 months). For employees this figure was 24 months (*range*: 1 month - 300 months).

The respondents' were asked the reasons for choosing bar work. Forty-four percent said that was due to unemployment, 10% found working with bars more profitable than previous job, 16% made a clear choice to work in bars, 14% were retired and 10% did not answer. The category "made a clear choice to work in bars" has been used to distinguish between people who said they worked in a bar because they had no other option, and people who said they worked in a bar because they wanted to do. Of the 67 outlet owners who had previously worked elsewhere, 14 (20.9%) said

their present occupation was more profitable, 49 (73.1%) said it was not, and 1 (1.5%) refused to answer.

### Profile of bars

Forty-six bars (53.5%) were identified as formal and 39 (45.3%) as informal. Thirty outlets surveyed (34.9%) were reported to have some form of license. Forty-three respondents (50%) said their establishment was unlicensed. Although referred to as "outlet owners" and "proprietors" in this paper, the results showed that 57 proprietors (66.3%) actually owned the premises and 26 (30.2%) rented. They had run the outlet for a median time of 36 months each (*range* 1-300). Seventy-six (88.4%) had no other alcohol outlets, while 5 proprietors (5.8%) ran establishments elsewhere. Forty-six respondents (53.5%) said the outlet was a good investment, 38 (44.2%) said it was not and 1 (1.2%) did not know. In 22 cases (25.6%) proprietors employed one or more staff (*median* =2; *range*: 1-7) and in 53 cases (61.6%) no additional members of staff were employed (*missing*  $n=9$ ). Data available on 75 of the outlets surveyed showed that proprietors employed a total of 48 staff between them. Two employees were friends of their boss's. The other 46 were all members of the outlet owners' families or extended families.

Answers from seventy-eight interviewees showed the mean number of days per week on which outlets traded to be 6.82, with  $SD$  0.75 (*range*: 2-7). Information on the number of hours outlets were open per week was obtained from 50 respondents. The mean number of hours per week that outlets were open for business was 85.76, with  $SD$  19.97 (*range*: 28-133). Seventy people interviewed (81.4%) said their outlet's busiest time fell between Friday and Sunday inclusive.

### Profile of clientele

Sixty-three people interviewed estimated the proportion of their clientele who lived in the immediate neighborhood. The mean percentage of clients said to live in the immediate neighborhood was 93.84%, with  $SD$  17.20 (*range*: 10-100). Sixty-one respondents gave an estimate of the percentage of their clientele in employment, the mean estimate being 78.23% employed, with  $SD$  29.02 (*range*: 5-100). When asked what percentage of their clients had families, 54 respondents were able to provide an estimate. A mean of 88.33% of clients were said to have families, with  $SD$  20.47 (*range*: 10-100). The median length of time that clients were said to spend in the bar on each visit was 30 minutes (*range*: 5-270; *missing*  $n=12$ ). When asked if there were clients who frequented the bar every day, 59 people

(68.6%) said there were daily customers, 16 (18.6%) said there were no daily customers, 1 person (1.2%) did not know and 1 person (1.2%) did not answer (*missing n* = 9). Sixty-seven respondents estimated the proportion of their clients who were “regulars.” A mean of 42.03% of clients were identified as “regulars,” with SD 31.50 (*range*: 2-100).

### Alcohol consumption

Seventy-one outlets (82.6%) sold alcohol to customers on credit, while 13 (15.1%) did not. A total of 78 people gave estimates of the percentage of alcohol they sold to their customers on credit. The mean estimate was 40.77% of all sales, with SD 33.59 (*range*: 0-100). When this calculation is restricted to those outlets which reported selling on credit, 65 respondents estimated the proportion of alcohol they sold in this way, the mean being 48.92% of all sales, with SD 30.86 (*range*: 1-100). The median proportion of all alcohol sold for consumption off the premises was 10% (*range*: 0-100). Respondents were asked which the most popular drinks were sold. The most popular beverage – pinga – was sold at an average (mean) price of R\$ 0.45 per 50 ml dose, about US\$ 0.25 (*SD* 6.75; *range*: 0.30-0.50). Lager was being sold for an average (mean) price of R\$ 1.46 per 750 ml bottle, approximately US\$ 0.82 (*SD* 0.09; *range*: 1.20-1.50). Seventy two percent of customers preferred pinga, 22% beer, 2.3% brandy, 1.2% contini (a kind of vermouth).

### DISCUSSION

As mentioned in the results, a measure of outlet density for the entire sample area is unavailable, due to difficulties some of the interviewers had collecting data. When the sample is reduced in size the density of alcohol selling points is 29 outlets per kilometer of roadway, or approximately 1 outlet per 12 properties. The first of these figures is more reliable, in part because it depends on interviewers' accuracy at counting outlets only, rather than outlets and other properties. Moreover, the latter figure includes street stalls in its definition of “properties” and, as such, may be an overestimate. Even when the analysis is restricted to the outlets/km of roadway calculation, a picture emerges of an area peppered with alcohol vendors. It should be noted that the study area are residential areas comprised solely of single- and two-story houses. There are thus far fewer inhabitants along a kilometer of roadway in *Jardim Ângela* than a similar length of road bordered by apartment blocks.

Consideration of other studies should serve to il-

lustrate the high outlet density found in *Jardim Ângela*. For example, Roncek & Maier (1991)<sup>10</sup> studied 4,396 city blocks in Cleveland with an average of 129 residents each. They chose Cleveland as their research site because it was regarded as having relatively serious crime problems and was known to have a large number of “recreational liquor establishments.” Like São Paulo, it is an industrial city. The largest number of bars per residential block encountered was 4, and this occurred on only one block. Most blocks had one bar. While this disallows any concrete comparison with the data obtained in the present study, it is nevertheless apparent that the *Jardim Ângela* neighborhoods have a remarkably high outlet density.

Given the evidence for a link between outlet density and numerous alcohol-related problems, a reduction in the number of outlets in the sample area should be made a priority by alcohol prevention efforts. Only 35% of the establishments interviewed reported having a license of any description, and half said they were unlicensed. For so many people to openly admit this fact to unknown interviewers is an indication that laws regarding license possession cannot be rigorously enforced at present. In addition, only 54% of establishments were bona fide bars. The rest were shops, bakeries, street stalls and private houses opened up to sell alcoholic drinks. Clearly, there are few legal obstacles to opening an alcohol trading post in *Jardim Ângela*.

Alcohol availability may be regulated by licensing laws designed to limit outlets' opening hours. The findings from this survey belie a strong need for a prevention policy comprising an enforced licensing strategy. Data obtained in *Jardim Ângela* showed that outlets traded for an average of over 85 hours per week. Only 7 bars reported opening on less than 7 days a week, the mean number of days being 6.82. The impression gained from talking to the interviewers is that many outlets did not adhere to a strict timetable and tended to close at night once the number of clients had dwindled to the point where it was no longer worth their while staying open. If this is the case – that some outlets' night-time opening hours are largely governed by the level of demand for alcoholic drinks – the implication is that this demand for alcohol is being met at virtually any hour of the day or night. There are certainly no licensing restrictions on opening hours; it is up to the proprietors the length of time they wish to stay open.

The low percentage of “take-away” sales suggests that easy accessibility to alcohol is affected very little by current opening hours. The results showed that,

on average, only 10% of alcohol was sold for consumption off the premises. If there were times of the day or night when alcohol was difficult to obtain, one might expect this to be reflected by a higher prevalence of take-away sales. For most establishments even this low figure gives an artificially high impression, as it includes outlets which only sold alcohol that way, such as bakeries, shops and street stalls.

Sales of *pinga* and lager were reported to surpass those of other drinks by a substantial margin. With violence in *Jardim Ângela* such a major concern, it is interesting to note that an analysis of the impact of different beverage types on assaults and homicide in Sweden found that beer and spirits (consumed on the premises) were more strongly associated with assaults than other drinks.<sup>9</sup> Furthermore, there are indications that spirits may be more likely to evoke aggression than other forms of alcohol.<sup>13</sup>

The popularity of *pinga* – a spirit distilled from sugar cane – is hardly surprising, as it sells at an average price of just US\$ 0.25 per 50 ml dose. The average cost of a 750 ml bottle of lager is US\$ 0.82. By way of comparison, a liter of milk in São Paulo costs US\$ 0.65. Beverage prices and clients' personal disposable income may be thought of as measures of the ability to purchase alcoholic drinks. Accessibility to retail alcohol is facilitated by low prices and high aggregate income. Although the latter is unlikely to be found in *Jardim Ângela*, respondents did estimate that, on average, 78% of their clients had jobs. The combination of cheap alcohol and a reasonable level of employment is a further indication of easy accessibility to alcohol within the sample area.

The popularity of *pinga* outstripped that of other drinks by some considerable margin, with 72% of outlets reporting *pinga* as their number one seller. No other spirit came close. This is interesting data because a number of studies have found that demand for spirits is more responsive to price changes than demand for other alcoholic beverages.<sup>1</sup> Thus, attempts to reduce consumption via price increases may be most effective for spirits. There is also evidence that drinking patterns may be affected more greatly by price changes at lower levels of income.<sup>15</sup> With regards to clients within the sample area, data on earnings are not available, yet it can be said with confidence that income levels are low. Specific targeting of *pinga* prices (perhaps via tax increases at the production stage) may thus be thought of as a potentially effective means of reducing spirit consumption. It is unlikely that clients would simply switch their allegiance to another type of spirit, as prices are notably higher. The availability of cheap is partly a

consequence of Brazil's massive sugar cane plantation program. It has been estimated that over two billion liters of *pinga* are produced each year, or approximately 13.2 liters per capita.<sup>3</sup>

The availability of retail alcohol is governed by factors which make it easier or harder to obtain. An impressive 83% of respondents said they sold alcohol on credit. When asked what proportion of their total sales were sold this way, the mean estimate was just under half of all sales. The sale and consumption of alcohol within the sample area is very much a community activity. Attempts at regulation must recognize this and carefully weigh up the potential costs to the community of proposals which, albeit well-intentioned, may have damaging consequences.

Firstly, around 90% of respondents said they lived in one of the three neighborhoods surveyed. In those establishments that employed staff, 46 out of 48 employees were members of the proprietor's own family. Clearly, it is community members who would have their economic interests challenged by regulations on alcohol outlets. In seeking to limit alcohol availability, it is one thing to organize a community coalition against "faceless" breweries or noisy nightclubs; it is something quite different when neighbors' livelihoods are at stake. Nearly 45% of outlet owners said they went into the business in the first place due to unemployment. When these data are considered, a picture emerges of an industry that has arisen out of necessity. Policy makers should be cautious not to punish members of a community they are seeking to help.

A way of balancing competing interests may be to prevent new establishments from opening up, rather than closing down existing vendors. The median length of time that proprietors had run their outlet was 3 years. One interpretation of this figure is that outlets are going in and out of business with relative frequency, and the fact that 44% of respondents said their outlet was not a good investment lends support to this idea. If limits were placed on the establishment of new points of sale, the potential for profit for those already in business would be enhanced, as competition decreased. It is unlikely that vendors would reject such measures.

Regulations on bars, in particular, may have repercussions related to the localized drinking habits. The results showed that the overwhelming majority of customers drink within their immediate neighborhood. If people were forced to travel some distance – to a different residential area, for example – it is conceivable they might encounter some hostility

from the “regulars” of other bars, possibly leading to violence. Restrictions should be enforced uniformly across several neighborhoods to reduce the chances of such problems occurring.

A reduction in the overall number of bars may lead to greater concentrations of patrons per bar which, in turn, could increase the potential for fights breaking out between clients. This has particular relevance to weekend drinking, as over 81% of respondents said their busiest time fell between Friday and Sunday inclusive. In addition, weekends are associated with elevated levels of assaultive violence in *Jardim Ângela*. The incidence of violence in or around bars should be closely monitored following the introduction of regulations on alcohol trading in the region,

to guard against unforeseen effects. It cannot be presumed that constraints on alcohol availability will necessarily lead to a reduction in violence, even if overall consumption is reduced.

The increased use of and trafficking in illegal drugs – in particular crack cocaine – in recent years is often cited as the underlying cause of these troubles. A clearer understanding of the respective involvement of drugs and alcohol in violent crimes committed in *Jardim Ângela* may reveal that alcohol plays a more significant role than is widely admitted. This evidence, in turn, would help attempts to increase support for alcohol prevention policies. Information gathering from sources such as police crime reports and hospital admissions should be considered as a means to this end.

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