Published in final edited form as:

Drug Alcohol Rev. 2016 May ; 35(3): 334–337. doi:10.1111/dar.12325.

Examining the Locations of Medical Marijuana Dispensaries in Los Angeles

Crystal Thomas, MSW and

UCLA Luskin School of Public Affairs, Department of Social Welfare, Los Angeles, California, USA

Bridget Freisthler, Ph.D.

UCLA Luskin School of Public Affairs, Department of Social Welfare, Los Angeles, California, USA

Abstract

Introduction and Aims—Little is known about the spatial distribution of medical marijuana dispensaries, particularly whether or not sites are disproportionately located in minority or communities with younger populations. This paper will assess if there is a relationship between medical marijuana dispensaries and neighborhood characteristics.

Design and Methods—This study used an ecological, cross-sectional design of 1000 Census tracts from Los Angeles city in 2012 to explore the relationship between neighbourhood sociodemographics, structural features of neighbourhoods and density of medical marijuana dispensaries. Locations of dispensaries were obtained through a premise survey of all listed dispensaries. Data on neighbourhood characteristics were obtained from Geolytics. The study used Bayesian conditionally autoregressive models that include controls for spatial heterogeneity to analyse the data.

Results—Findings show that dispensaries are located in areas that allow for commercial establishments. Results indicate a positive relationship between dispensaries and percent commercially zoned, areas with highway ramp access, density of on- and off-premise alcohol outlets and percent Hispanic residents.

Discussion and Conclusions—In sum, the findings suggest that, likely due to zoning regulations, dispensaries were located in primarily commercially zoned areas with greater road access (as measured by the presence of highway ramps). Given that areas with higher densities of dispensaries also have higher densities of alcohol outlets, future work should examine how this co-location affects neighbourhood problems such as crime and violence.

Keywords

dispensaries; medical marijuana; Los Angeles

In 1996, California passed Proposition 215, also known as the *Compassionate Care Act*, allowing for the production, distribution and cultivation of marijuana for medical purposes. Local municipalities were tasked with determining how medical marijuana could be distributed within their boundaries. In spite of measures designed to regulate distribution, many have concerns regarding where dispensaries operate in communities. Jurisdictions have struggled to standardise the spread of dispensaries, particularly within the city of Los Angeles where hundreds of dispensaries are located. Los Angeles has attempted to regulate the number of dispensaries through ordinances that include zoning restrictions limiting the locations of dispensaries around schools and similar sites. However, little is known about the spatial distribution of dispensaries resulting in widespread concern about whether or not some communities, such as minority communities, are being disproportionately affected by their presence.

An analysis of the location of dispensaries throughout 39 California cities indicate that dispensaries are located in block groups with higher rates of poverty, co-located next to alcohol outlets, and in areas just outside city boundaries [1]. Dispensaries in Denver, Colorado open in neighbourhoods that have higher crime rates, but are not disproportionately located in Black, Hispanic or poor neighbourhoods [2]. Zoning restrictions in Los Angeles permit the operation of dispensaries in commercial areas, often with highway ramp access and in close proximity to alcohol outlets, while also establishing buffer requirements for schools, parks, libraries and other dispensaries but these restrictions may not be uniformly followed [1,3].

The density of these dispensaries is a concern as having more of them means marijuana is more widely available for use. At the city level, density of dispensaries and delivery services are positively related to marijuana use and frequency of use [4]. At the state level, while there is no association between dispensaries and use, there is a positive and significant association between heavy use for youth and states that permit home cultivation of the plant [5]. Thus, certain groups may be at risk for increased use if dispensaries are disproportionately located in their neighbourhoods [1].

Method

This study used an ecological, cross-sectional design to explore the relationship between neighbourhood demographics and density of dispensaries in Los Angeles. The sample included all Census tracts within Los Angeles City boundaries ($n = 1000$).

The dependent variable is density of medical marijuana dispensaries per area ($\bar{x} = 3.380$). Locations of dispensaries were determined by a survey of dispensary locations which drew from three sources: (i) a list of registered dispensaries with the City Department of Finance; (ii) registries of dispensaries from websites, and (iii) trade publications with advertisements for dispensaries. Data collection procedures included comprehensive protocols to identify if a site was operating as a dispensary. In total, 476 dispensaries were identified within city boundaries. Dispensaries were geocoded and aggregated to Census tract.

Data for the independent variables were obtained from 2012 GeoLytics Inc. estimates, which uses the U.S. Census Bureau's state and county level estimates of population and income characteristics (including data from the American Community Survey), along with area-level birth and death records to calculate current year estimates for smaller geographies [6]. Variables include: (i) percent of Black residents ($\bar{x} = 8.081$), (ii) percent of Asian-American residents ($\bar{x} = 10.726$); (iii) percent of Hispanic residents ($\bar{x} = 49.326$); and (iv) percent of population under the age of 20 ($\bar{x} = 23.077$) for each Census tract.

A variable for concentrated disadvantage was created to measure the level of disadvantage within each Census tract ($\bar{x} = 0.000$) using data from GeoLytics. The variable is a factor score of: unemployment rate, percent of families below the poverty level, average household income, median home value, percent renter and percent single-female headed households with children. The factor score was extracted by Principal Component Analysis with a varimax rotation, explaining 61.6% of the variance. A categorical variable for the presence of highway on-ramps indicated easy commercial access ($\bar{x} = 0.330$). The Los Angeles City Department of Planning provided 2014 zoning information to compute commercial zoning ($\bar{x} = 8.642$).

Los Angeles County Office of Education provided public school addresses and the California Department of Education provided private school addresses for the 2011–2012 school year ($\bar{x} = 4.479$). Los Angeles County of Parks and Recreation provided addresses for parks and libraries ($\bar{x} = 1.304$). All addresses were geocoded to point location.

Data on alcohol outlets were obtained from the Department of Alcoholic Beverage Control for 2012. Two continuous variables detailing density of on-premise (establishments where alcohol is consumed on site) ($\bar{x} = 14.096$) and off-premise alcohol outlets (establishments that sell alcohol to be consumed at a different location) ($\bar{x} = 9.709$) per square mile were included in the analysis.

Data were analysed using Bayesian conditionally autoregressive (CAR) models that include controls for correlated heterogeneity due to spatial structure of the data [7]. The outcome variable (medical marijuana dispensaries) was treated as having a Poisson distribution. We used the Deviance Information Criterion [8] to choose the best model for the data. The model with both correlated and uncorrelated heterogeneity had a DIC of 2251.48, the model with only uncorrelated heterogeneity was 2331.16, and the model with only correlated heterogeneity was 2250.60. As a lower DIC is better to have the most parsimonious model, the final model only includes correlated heterogeneity.

Results

Table 1 presents the descriptive statistics for all variables included in the model. Table 2 shows the results of the full model. The percentages of Black residents, Asian American residents, youth under the age of 20, and concentrated disadvantage, were not related to density of dispensaries. Census tracts with higher percentage of Hispanic residents have more dispensaries.

Higher density of dispensaries was located in areas with higher percentage of commercially zoned land, greater densities of on-premise alcohol outlets, greater densities of off-premise alcohol outlets, and having at least one highway on or off ramp. Density of schools, and density of parks and libraries were not related to density of dispensaries.

Discussion

City zoning requirements appear to control locations of dispensaries such that they locate in commercial areas with specific place characteristics. Dispensaries are located in areas zoned primarily for commercial use with highway access allowing for easier access by populations using the dispensaries. Similar to previous analyses, Census tracts with higher densities of dispensaries also have greater densities of alcohol outlets [1].

Greater densities of dispensaries in Los Angeles are found in areas with higher percentages of Hispanic populations. Residents of these communities may, by default, be exposed to a larger number of dispensaries and the potential risks that they pose such as more frequent marijuana use [4].

Density of dispensaries was not related to percent Black, percent Asian, concentrated disadvantaged, and areas with a higher percentage of youth under 20 years of age. These results are similar to the examination of dispensary locations in Denver, Colorado which found that dispensaries are not located in Black or impoverished neighbourhoods [9].

Limitations

The findings from the report are based on an ecological, cross-sectional study. Consequently, no conclusions can be drawn about causation. All analyses were conducted at the neighbourhood level; therefore, these results should be interpreted with caution so as not to ascribe aggregate results with implications for the individual.

Neighbourhood selection bias may also limit interpretation of the results. External factors related to the neighbourhoods in which dispensaries locate may influence the current relationships. Moreover, while Census tracts are often used to approximate neighbourhoods, smaller units (e.g. Census block groups) or use of spatial clusters that may shed greater light on the characteristics of neighbourhoods in which dispensaries are located. Similarly, since populations and place characteristics (e.g. highway ramps) are not evenly spread across the areal unit, thus clusters may better highlight areas with greater densities of dispensaries.

Conclusion and Implications

The purpose of this study was to examine the location of dispensaries as they relate to a selection of population and place characteristics. Zoning laws that regulate the location of dispensaries appear to be an effective mechanism to prevent the overpopulation of dispensaries in undesirable areas. For example, dispensaries are located in commercially zoned areas rather than residential areas. However, certain populations, such as Hispanic residents, may be disproportionately impacted by the density of dispensaries in communities. In order to prevent the overpopulation of dispensaries in any particular area, policymakers might consider local regulations to monitor the number of dispensaries in a

given jurisdiction. As legislation for recreational marijuana use across the country is considered, special attention should be placed on how marijuana is sold in retail stores. As one example, if marijuana (including products such as edibles) are allowed to be sold in more venues (e.g. convenience stores) the pattern of results might look very different.

Marijuana policy continues to evolve and the subsequent impact of policies on communities may also shift concurrent with policy changes. More nuanced studies that investigate residential activity spaces and the patterns by which residents come into contact with dispensary locations throughout communities may provide a better understanding of the relationship between residents and use.

Acknowledgments

Research for and preparation of this manuscript were supported by NIDA Grant R01-DA-032715. The content is solely the responsibility of the authors and does not necessarily represent their views.

References

1. Morrison C, Gruenewald PJ, Freisthler B, et al. The economic geography of medical cannabis dispensaries in California. *Int J Drug Policy*. 2013; 25:508–15. [PubMed: 24439710]
2. Boggess LN, Pérez DM, Cope K, et al. Do medical marijuana centers behave like locally undesirable land uses? Implications for the geography of health and environmental justice. *Urban Geogr*. 2014; 35:315–36.
3. Hoeffel, J. The Los Angeles Times: Los Angeles City Council passes medical marijuana dispensary ordinance. Jan. 2010 Available at: articles.latimes.com/2010/.../local/la-me-medical-marijuana20-2010jan20
4. Freisthler B, Gruenewald PJ. Examining the relationship between the physical availability of medical marijuana and marijuana use across fifty California cities. *Drug Alcohol Depend*. 2014; 143:244–50. [PubMed: 25156224]
5. Pacula RL, Powell D, Heaton P, et al. Assessing the effects of medical marijuana laws on marijuana and alcohol use: the devil is in the details. *National Bureau of Economic Research Working Paper*. 2013:19302.
6. GeoLytics Premium Population Estimates. East Brunswick, N.J: GeoLytics, Inc; 2012.
7. Spiegelhalter DJ, Dawid AP, Lauritzen SL, et al. Bayesian analysis in expert systems. *Stat Sci*. 1993; 8:219–47.
8. Zhu L, Carlin BP. Comparing hierarchical models for spatio-temporally misaligned data using the deviance information criterion. *Stat Med*. 2000; 19:2265–2278. [PubMed: 10960852]
9. Boggess LN, Pérez DM, Cope K, et al. Do medical marijuana centers behave like locally undesirable land uses? Implications for the geography of health and environmental justice. *Urban Geogr*. 2014; 35:315–36.
10. California Police Chief's Association. White paper on marijuana dispensaries. Apr. 2009 Available at: <https://www.procon.org/sourcefiles/CAPCAWhitePaperonMarijuanaDispensaries.pdf>

Table 1

Descriptive statistics for dependent and independent variables across census tracts in Los Angeles, CA (N=1000)

Variable	<i>M</i>	<i>SD</i>
MMD density		
Density of dispensaries per census tract	3.380	6.487
Population characteristics		
Percent Black	8.081	13.681
Percent Hispanic	49.326	31.351
Percent Asian	10.726	12.203
Percent under 20 years of age	23.077	7.914
Neighbourhood characteristics		
Concentrated disadvantage	0.000	0.995
Highway ramps	0.330	0.471
Percent commercially zoned	8.642	10.994
On premise outlet density	14.096	32.406
Off premise outlet density	9.709	11.041
School density	4.479	7.490
Parks and libraries density	1.034	2.639

Table 2

Model results for correlated heterogeneity model, reported as MCMC sample mean (97.5% CI).

Variable	Coefficient	95% Credible Interval
Constant	−1.433	(−2.158, −0.721)
Population characteristics		
Percent Black	0.161	(−7.662, 0.033)
Percent Hispanic	0.011**	(7.499, 0.021)
Percent Asian	0.003	(−0.011, 0.018)
Percent under 20 years of age	0.018	(−0.009, 0.044)
Neighbourhood characteristics		
Concentrated disadvantage	0.160	(−0.077, 0.397)
Highway ramps	0.267**	(0.016, 0.517)
Percent commercially zoned	0.024**	(0.011, 0.038)
On premise outlet density	0.005**	(0.002, 0.009)
Off premise outlet density	0.024**	(0.012, 0.035)
School density	−0.008	(−0.026, 0.008)
Parks and libraries density	0.021	(−0.015, 0.057)