

The extent to which storefront alcohol advertising differs by community profile in Michigan

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SUMMARY

Alcohol-linked morbidities are the third leading cause of preventable deaths in the United States. Previous studies have shown that alcohol manufacturers may target ethnic minorities and youth with specific forms of advertisements in certain cities. Less is known about alcoholic storefront advertising disparities among the suburban communities of Metro-Detroit, Michigan, or about the features of storefront alcoholic advertisements in the Metro-Detroit suburbia, such as how content, size, and location are applied to target various demographics. We conducted a cross-sectional field survey of storefront alcohol advertisements in two Metro-Detroit suburban communities in close proximity: the high-income, nonminority community of Birmingham and the low-income, minority community of Pontiac. We recorded the characteristics and occurrence of storefront alcohol advertising for all licensed alcohol retailers, excluding chain grocers and pharmacies, within six defined census tracts. We determined the differences between the communities in advertisement characteristics and number using independent t-tests. We utilized Google Earth to map the position of alcohol retailers and schools. Ultimately, we found that Pontiac had more alcohol advertisements per retailer and malt liquor advertisements, with advertisements more likely to be larger and within 1,000 ft of a school ($p < 0.05$). These findings emphasize the need for more effective regulation of storefront alcohol advertising in Metro-Detroit communities to prevent exploitation of vulnerable residents.

INTRODUCTION

The impact of neighborhood characteristics, distinguishing traits such as amount of urban blight or ecological setting, on residents' health has become a more prevalent topic of discussion since the early 2000s (1, 2). These factors, which include ecological setting, population, amount of urban blight, and also store density and advertisement density for various products, have begun to receive recognition alongside the already well-publicized impacts of poor air and water quality, substandard housing, proximity to hazardous substances, and lack of access to nutritious foods (3, 4). In particular, the influence of alcohol outlet density and alcohol storefront advertisement density negatively impacts resident health and can be stronger predictors of homicide, arrest rate, and violence than race or ethnicity (4–6). The crime rate of Pontiac, Michigan is higher than 93% of all US cities (7). Our

study could provide insight into methods for lowering crime in Pontiac neighborhoods if there is a causal relationship between prevalence of alcohol advertisements and crime.

Alcohol is the most widely used drug amongst American teenagers, with over 4,000 teenage deaths from alcohol-connected morbidities and an additional 200,000 teenagers treated in emergency departments for alcohol-related issues (8–10). According to the Center on Alcohol Marketing and Youth at the Johns Hopkins Bloomberg School of Public Health, the frequency and rate at which populations consume alcohol is impacted by the amount of exposure residents have to alcohol advertisements (4, 11). Alcohol consumption is influenced by factors such as occurrence, size, and density of storefront alcohol advertisements in neighborhoods (10, 12). One strategy by which companies propagate alcohol use in a manner designed to selectively reach specific populations may be through their use of storefront alcohol advertising (4). Numerous public health officials have criticized the alcohol industry for allegedly targeting racial and ethnic minority groups through advertising (13, 14). For instance, McKee *et al.* found that malt liquor advertisements were more common in minority-majority neighborhoods (15). This critique is further substantiated by the numerous field studies measuring storefront alcohol advertisement quantity in large cities such as Boston and New York. One study found that in certain regions, alcohol advertisement mediums, including those for malt liquor which has a higher alcohol percentage than typical beer, are most pervasive in low-income, African American neighborhoods compared to their high-income, nonminority counterparts (6). Despite the growing concerns of public health officials, no previous studies to date comparing alcohol storefront advertisement occurrence (frequency) and characteristics have been conducted in the suburban surrounding areas of Detroit, Michigan, known as Metro-Detroit. This area includes numerous communities such as Pontiac and Birmingham, which, despite sharing close proximity, have deeply contrasting socioeconomic and ethnic profiles.

National Public Radio (NPR), once termed the community of Pontiac as the “forgotten city.” Pontiac was once a booming hub for factories and the manufacturing industry (14). It began to decline in the late 1970s, forming part of Southeastern Michigan's rustbelt (7). Today, Pontiac is 75% minority with an increasing influx of Hispanic immigrants (7). It is Michigan's 14th poorest city out of over 1,000 cities with 34% of residents living in poverty (7). A mere 2.9 miles away lies the community of Birmingham, which in contrast is 97% nonminority with low immigration, has a low crime rate in the bottom 20% of all US cities and is Michigan's 4th richest city (7). The well-being of local residents in each community is very different despite their close proximity. It may be easier for proponents of the

alcohol industry to advertise to minority groups based on targeting specific neighborhoods in Southeastern Michigan industry given the lingering effects of redlining (refusing to offer credit or insurance based on race, ethnicity, or location) and segregationist policies in Metro-Detroit (16). Since many minority families in the inner city were unable to secure a loan, they were unable to move to the suburbs like their white counterparts. These policies have contributed to the segmentation of some communities based on race and ethnicity, including Birmingham and Pontiac (16, 17).

Because the built environment - including the physical structure and appearance of buildings and how people interact with those structures - acutely affects resident health, we believe analyzing the alcohol advertisements' characteristics in Pontiac and Birmingham is useful to determining whether action should be taken to improve community wellbeing. Such actions may include determining if legislative measures, such as banning alcohol advertisements within 1,000 ft of a school or offering media literacy classes, ought to be implemented in Pontiac. Currently, there are no legislative measures in Michigan banning alcohol advertisements around schools unless it involves actual school property. The results of our study provides data into crime rate disparities between the two communities, giving public officials wider insight into the areas they serve. Liquor outlets with alcohol advertisements visible from the street have been correlated with higher rates of crime within 1,000 ft of their properties (18). Additionally, alcohol outlet density is positively correlated with increased crime (19). Measuring potential disparities is important specifically in the previously unstudied communities of Metro-Detroit, since public health outcomes for youth and residents

greatly differ despite sharing close proximity (7). There has been substantial documentation of targeted advertising towards minority teenagers in magazines, on the radio, television, and on billboards, but fewer studies on alcohol storefront advertisements, of which generally only measure advertisement quantity and not characteristics (13, 18).

Seidenberg *et al.* conducted a study detailing the disparities in storefront tobacco advertising between two Massachusetts communities in close proximity but highly different demographics (4). This study characterized Dorchester as low income and predominantly minority; and Brookline as high income and predominately non minority. After Seidenburg *et al.* ran a field survey, it was found that more advertisements occurred within Dorchester than in Brookline, and more advertisements were closer to Dorchester schools and more likely to advertise menthol-based products, which, like malt liquors, tend to be concentrated in low-income regions (4). Storefront tobacco advertising bears numerous characteristics with storefront alcohol advertising; however, more research has been conducted on tobacco storefronts (19). Both advertisements have adverse effects on their communities and are marketed disproportionately towards minority groups.

The aim of our study is to ascertain the extent to which storefront alcohol advertising differs in the cities of Pontiac and Birmingham based on advertisement occurrence and characteristics. We hypothesized that Pontiac will have more frequent and larger alcohol advertisements, increased prevalence of malt liquor advertisements, and more advertisements in closer proximity to schools. We used the Seidenberg study as a model for our study design

Feature	Birmingham*	Pontiac#	p
Total Retailers	11	17	
<i>Retailer type</i>			0.412
Alcohol (wine/liquor)	7 (63%)	7 (41%)	
Convenience store	0 (0%)	6 (35%)	
Gas	4 (36%)	4 (23%)	
Total ads	27	193	
Retailers with ads	8 (72%)	16 (94%)	0.433
Mean ads/retailer	2.45	10.94	0.001
<i>Location</i>			
Ads within 1,000 ft radius of schools	0 (0%)	64 (67%)	0.041
<i>Size</i>			
Small ads	14 (52%)	28 (15%)	0.679
Medium ads	1 (4%)	39 (21%)	0.028
Large ads	12 (44%)	118 (64%)	0.005
<i>Content</i>			
Malt Liquor Ads	0 (0%)	42 (22%)	<0.001
Ads with price	0 (0%)	98 (51%)	0.001

Table 1: Number and characteristics of storefront alcohol advertisements. Table Model derived from Harvard 'Storefront Cigarette Advertising Differs by Community Demographic Profile' (3). *Limited to 2010 U.S Census Tracts 1529, 1532, and 1505, #Limited to 2010 U.S Census Tracts 1416, 1422, and 1415.

and comparative analysis of two neighboring communities with different demographic profiles, where we surveyed the alcohol storefront advertisements in Birmingham and Pontiac. Thus, the survey criterion from Seidenberg et al. was adapted to fit this study (4). By quantifying the elements which may contribute to poor quality of life for Pontiac residents, we believe our study will assist in establishing measures to improve overall public health.

RESULTS

There was no overall difference in the proportion of store types (convenience store, gas station, liquor store) found in each community ($p = 0.412$) of the 28 registered alcohol retailers in Pontiac and Birmingham. 220 individual alcohol advertisements were identified within the two communities ranging from 0 to 40 storefront alcohol advertisements per retailer. These included posters, illuminated and non-illuminated signs, placards, price listings, flags, flyers, and stickers (Table 1). Although alcohol retailers in Pontiac represented 60% of all retailers visited, they displayed 87% of the storefront alcohol advertisements within the two communities. We ran a binomial distribution test and found that there was a 0% chance that we would see this number of ads by chance. Of the retailers that displayed advertisements, the mean number of storefront alcohol advertisements per retailer was significantly higher in Pontiac than in Birmingham (10.94 and 2.45, respectively, $p < 0.001$). However, the percent of retailers displaying any storefront alcohol advertisements was not higher in Pontiac ($p = 0.433$).

Differences in size and other storefront alcohol advertising features were also discovered between the two communities. Compared with Birmingham, Pontiac had a greater proportion of large advertisements ($p < 0.005$), as

well an increased proportion of malt liquor brand advertising ($p < 0.001$) (Figure 1b, 1c, 1e). A greater proportion of alcohol advertisements in Pontiac displayed price ($p < 0.001$). However, as no advertisements in Birmingham displayed price, the average difference between the two advertised prices were not measured. Measuring the number of advertisements displaying price is significant because a high number of advertisements displaying price may indicate a low-income community is being catered to, while in high-income areas like Birmingham, price is less of a deciding factor. Additionally, there was a larger portion of advertisements within 1,000 ft of a school in Pontiac ($p < 0.05$).

DISCUSSION

The dissimilarities in storefront alcohol advertising between the two Metro-Detroit communities raise concerns for promoting public health betterment and safety, congruent to the findings of a study by the Harvard Medical School which originally influenced our hypothesis and research approach (4). African Americans and Hispanic individuals in Birmingham and Pontiac face disproportionate alcohol-related social and personal health issues compared with Caucasians, and increased exposure to alcohol storefront advertisements may exacerbate these issues (20). Additionally, census data reveal that Pontiac has a larger proportion of residents under 18 years of age than Birmingham, potentially causing a disproportionate influence of alcohol advertising on youth in Pontiac. The findings of more alcohol advertising and malt liquor advertising in Pontiac compared to Birmingham are consistent with the results of previous research in other states (13, 2). My work agrees with the results of previous studies (21, 22).

Importantly, as the first study on Metro-Detroit



Figure 1: Representative images of storefront advertising in Birmingham and Pontiac, Michigan in June 21, 2021. A) Kakos Liquor Store in Birmingham. B) Huron Liquor Store in Pontiac. C) King's Liquor Store In Pontiac. D) Ellie's Liquor Store in Birmingham. E) Huron Liquor Shoppe in Birmingham Michigan.

communities, our study recapitulates the findings of similar studies comparing high- and low-income communities (2, 4, 13). Brenner *et al.* found that low-income, minority neighborhoods had a higher alcohol outlet density than other neighborhoods (23). In contrast, we identified no difference between the proportion of alcoholic outlets in Pontiac compared to Birmingham. Therefore, in Michigan, increased alcohol advertisement occurrence in certain poor, minority communities is not necessarily a byproduct of increased outlet density. Additionally, it shows that advertisement and outlet differences vary by community and sample size. Therefore, our results demonstrate that some of the characteristics that were not considered statistically significant may not be insignificant in all communities.

In Pontiac, a greater proportion of alcohol advertising was found and possessed a higher mean of advertisements per retailer, compared with Birmingham; however, based on a binomial distribution test there appears to be external factor(s) influencing the number of ads. Higher percentages of advertisements in Pontiac were larger in size, promoted malt liquor brands, included a price, and were within 1,000 ft of a school. Advertisement size is important because large advertisements are more noticeable and have a larger impact on the viewer (4). This measurement of advertisement frequency was important because there is a positive correlation with the number of advertisements youth are exposed to and the amount they drink (8). Our data suggest that alcohol companies, with the inexplicit compliance of retailers, may be using advertising features against government regulations and self-regulated alcohol industry policy to promote alcohol use among youth, ethnic minorities, and people of low socioeconomic status.

To evaluate our results, we must consider some limitations. First, data was sampled once in each of the three census

tracts from Pontiac and three from Birmingham. Secondly, the survey results only reflect the urban environment of six census tracts from one composite day. As storefront advertisements are cycled out every few months, the number of advertisements could have varied in a different month. If this survey was conducted multiple times in a longitudinal study with the same stores, then we may have uncovered more compelling evidence to prove or disprove the hypothesis that alcohol advertisements are more frequent in poor, minority dominated communities and located near schools.

Additionally, this survey was only conducted in six specific census tracts: 1505, 1532, and 1529 of Birmingham, along with 1415, 1422, and 1416 of Pontiac. If the survey had been conducted in more or all the census tracts within Birmingham and Pontiac, our results may have more accurately reflected the features of storefront advertising in the two communities. Moreover, this study did not examine the gender or sexual orientation demographics, although LGBT+ community members are often targeted by alcohol corporations (24).

This study can serve as a foundation for future research to inspect more particular facets of the influence of alcohol advertising. Since our study was limited to only six tracts of these Birmingham and Pontiac cities, it could be conducted in all of Birmingham and Pontiac multiple times to determine if the results change depending on the month or when larger sample size is employed. Finally, additional studies are needed to determine if the higher density of alcohol advertising in the poor, minority community of Pontiac is a function of deliberate racism and exploitation or pragmatic business measures.

The aim of our study was to evaluate the extent to which alcohol storefront advertisements are more prevalent in the low-income, minority community of Pontiac compared with the high-income, nonminority community of Birmingham. Initially, we hypothesized that Pontiac would have more alcoholic

Pontiac		Birmingham	
	Distance (feet)		Distance (feet)
Trademark Liquor	109	Mobil	1086
Rick's Gas Station	188	Old Woodward Cellar	2332
Star Party	242	ML Spirits	3023
Five Brothers Market	406	Shell	3040
Perry Inc. Gas Station	570	Kakos Fine Wine and Spirits	3460
Huron Liquor Shop	990	Griffin Claw Brewing Co	3654
Justin's Gas Station	1096	Elie Wine Co	3835
University Drug and Liquor	1360	Speedway	3901
King's Liquor	3200	Birmingham Wine	5687
Supermercado La Paloma	3200	Barrels and Vines	6844
Marco Food Market	3200	Coolige Mart Inc	7720
Pontiac Foodland	4027		
Marathon Gas Station 2	4200		
Latino American Market	4357		
Perry's Palace Liquor Store	4670		
In N Out Liquor	4797		
Del Pueblo Tortillas & Grocery	4871		

Table 2: Distance in feet between storefront alcohol advertisements and public schools in Pontiac and Birmingham.

storefront advertisements of a larger size, higher average alcoholic content, detachment, and within 1,000 ft of schools. Our results suggest this hypothesis is true. These findings fit into the existing body of research on this subject by identifying another population that alcoholic storefront advertising disproportionately impacts low-income and minority communities (4, 23). Additionally, our research in Metro-Detroit is essential for passing future public health legislation in Oakland County, MI, such as banning advertisements within 1,000 ft of a school, which rely on studies providing evidence of the presence of disproportionate, influential alcohol advertising near schools (Table 2) (11). Our study also offers insight into Pontiac's high crime rate. It raises awareness of the disproportionate marketing Pontiac faces and the potential exploitation of its residents. Thus, these results may have implications for the future of public health legislation in the Metro-Detroit area and toward the implementation of media literacy classes for local youth.

MATERIALS AND METHODS
Participant Selection

The current study was modeled after the Seidenburg et al. study (4). A cross-sectional field survey of storefront alcohol advertising occurrence and features was performed in two Michigan communities located within the greater Metro-Detroit, Michigan, suburban area, Pontiac and Birmingham. These two communities were selected since they are close in location despite their contrasting demographic compositions. According to the 2010 U.S Census, Pontiac has a large African American population (48.7%) and Hispanic population (18%), with 34.4% of its residents living below the federal poverty line (Table 3) (7). By contrast, Birmingham has a much smaller African American population (2.8%) and Hispanic population (2.8%), with only 4.4% of its residents living below the federal poverty line (Table 3). The characteristics and frequency of alcohol storefront advertising in the minority, low-income community of Pontiac (tracts 1529, 1532, and 1505) were compared with the predominately white, high income community of Birmingham (tracts 1416, 1415, and 1425).

According to the 2010 U.S. Census, the populations of Pontiac and Birmingham were 59,792 and 21,142, respectively. Due to this disparity in population of each community, three census tracts as defined by the 2010 U.S. Census were selected. Pontiac was limited to Census tracts 1416, 1422,

and 1415. Birmingham was limited to Census tracts 1529, 1532, and 1505.

Alcohol retailer listings for Pontiac and Birmingham were obtained from the Michigan Department of Public Health (MDPH) and Google Maps, which was used as a visual-spatial tool. Using the U.S 2010 Census data, maps of tracts, and the Project feature of Google Earth, a total of 11 registered alcohol retailers in Birmingham and 17 in Pontiac were identified. Chain grocery stores and pharmacies were excluded from the survey despite their status as alcohol retailers, thus only local convenience stores, gas stations, and liquor stores were included in the survey. This exclusion was necessary because chain stores typically must adhere to some degree of external aesthetic continuity (25), and we aimed to examine potential advertisement disparities across the two communities without the impact of outside regulation.

Materials and Measures

To discern if storefront alcohol advertising differed by community profile in Pontiac and Birmingham, the survey results for each community were analyzed using a standard independent *t*-test using Microsoft Excel. The sample means for the scores of each inquiry measure for the two communities were recorded, as well as numerical differences and percentages of advertisement frequency and features (advertisement size, content, and proximity) between the two cities (Table 3). In this study, *p* < 0.05 was considered statistically significant. An independent two-tailed *t*-test was used in this study because it is most often used to evaluate and analyze two populations in the context of a social science.

The location of the 28 alcohol retailers was mapped alongside K-12 school coordinates using the Project feature of Google Earth, with schools identified using data from the Michigan Department of Education. Boundaries of 1,000 ft were marked around each alcohol retailer and mapped school, with overlap identifying retailers within 1,000 ft of a school. The outdoor retail alcohol advertisements were then counted and qualified employing a standardized survey criterion (Table 1). Each outlet was visited by two members of the research team from January 2020 to March 2020. For all outwardly perceptible alcohol advertisements, excluding any advertisements inside the store, size (large: 2 × 3 ft [0.56 m²] area or larger; medium: sized between small and large, and small: not exceeding an 8.5 × 11 inch [0.06 m²]

Census Tract	Pontiac				Birmingham			
	1416	1415	1422	Total	1529	1505	1532	Total
Population	4,485	6,378	2,764	59,955	4,289	2,624	1,916	21,201
White	19%	16%	10%	23%	83%	87%	92%	88%
Black or African American	58%	58%	76%	50%	4%	5%	2%	3%
Hispanic or Latino	20%	20%	12%	19%	2%	1%	3%	3%
≥18 years	72%	70%	71%	75%	82%	81%	84%	76%
Median family income	\$37,823	\$36,481	\$17,461	\$33,568	\$95,833	\$156,136	\$131,818	\$122,804
Individuals below poverty level	34%	28%	39%	31%	6%	2%	3%	5%
Bachelor's degree or higher	9%	15%	6%	13%	66%	82%	77%	77%
Size (square miles)	1.3	1.9	0.6	19.9	0.9	2.1	0.3	4.8

Table 2: Demographic characteristics of Pontiac, Birmingham. Based on 2019 American Community Survey data. Table Model derived from Harvard 'Storefront Cigarette Advertising Differs by Community Demographic Profile' (3).

area); advertised price, and whether a malt liquor brand was recorded (**Table 1**). Detached advertisements were not included, unlike the parent study, because there were very few in either community. The same size classifications were used as Seidenburg *et al.* (4). Independent *t*-tests were employed to calculate the mean alcohol advertisements per retailer, and to examine for census tract-level disparities between remaining advertisement characteristics.

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