

A Geographic Analysis of Tobacco Advertising in Oneida, Madison and Herkimer Counties, NY

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Report produced by Alaina Mallette, Jonnell Robinson and Lucas Barros-Correia
Syracuse Community Geography



In partnership with
BRiDGES Madison County Council on Alcoholism and Substance Abuse, Inc.
BRiDGES to Prevent Tobacco of Madison, Oneida, and Herkimer County
Reality Check of Madison, Oneida, and Herkimer County

Project Overview

The BRiDGES Tobacco Prevention Team approached Syracuse Community Geography and requested maps that would show the locations of licensed tobacco retailers in Herkimer, Oneida and Madison Counties. Thus, maps that overlay the locations of licensed tobacco retailers with various demographic, socioeconomic, and health data were created.

This report summarizes relevant literature on the influence of tobacco marketing and advertising and tobacco use among youth and summarizes the results of our geographic analysis of licensed tobacco retailer (LTR) locations. The maps produced for this report investigate the geographic proximity of LTRs to public schools, as well as the spatial relationship between LTRs and the demographic and social makeup of the three counties, including age, educational attainment and poverty. The locations of LTRs in relation to health outcomes associated with tobacco use were also mapped.

Research Questions

The research questions addressed by this project include: (1) how prevalent is licensed tobacco retailing in each county, (2) how many licensed tobacco retailers are located within one-half and one mile of public schools, (3) what are the age demographics and socioeconomic characteristics of each county, and (4) to what level are the three counties affected by asthma, lung and bronchial cancer?

Community Partners

BRiDGES (the Madison County Council on Alcoholism and Substance Abuse, Inc) is incorporated as a private, not-for-profit organization whose mission is to improve the quality of life by providing advocacy and services in the community, the workplace, and to families and individuals affected by addiction and the abuse of alcohol, tobacco and other substances. BRiDGES offers prevention and intervention programs that promote, change, and build healthy communities. BRiDGES programming includes training for alcohol service providers, under-age drinking prevention programs, smoking cessation support, substance abuse counseling and referral, employee assistance programs for local employers, and gambling addiction programs. BRiDGES operates with a staff of about 15 people in Madison County and assists communities in four counties.

Reality Check of Central New York is an organization created in 2000 that focuses on informing youth, parents, legislators, community members, and key decision makers on the harmful effects of tobacco use and of tobacco advertising. Focusing on youth leadership and activism, Reality Check has participated in anti-tobacco initiatives in New York State such as the “We’ve Seen Enough” campaign.

Syracuse Community Geography is a university-community collaboration that uses Geographic Information Systems (GIS) to map and analyze topics of concern to community members in the Greater Syracuse Area. GIS mapping and geographic analysis can help the community to visualize challenges in new ways by raising spatial awareness about community problems and resources, informing planning processes, supporting community organizing, and advocating community concerns. All projects address community-identified needs and priorities. Syracuse Community Geography partners with community-based organizations working in the areas of: community and urban development, public health, transportation, and social and environmental justice. Utilizing a participatory process, students and faculty at Syracuse University partner with community-based organizations to undertake rigorous research. Project results, reports, maps and datasets are made publicly available in an effort to improve access to new information.

Literature Review

Tobacco use is one of the four most common behaviors causally linked with non-communicable diseases (WHO, 2010). Each year, cigarette smoking causes 443,000 deaths in the US alone. Of these deaths, 49,400 are connected to secondhand smoke (CDC, 2008). Both smoked and smokeless tobacco contribute to annual tobacco-related costs faced by the US, consisting of \$96 billion in medical expenses and \$97 billion in lost productivity (Office of the Surgeon General, 2012). Tobacco use has been reported to increase the risk of long-term chronic diseases, such as multiple types of cancers and lung diseases (Office of the Surgeon General, 2012).

These health problems arise as a result of long-term use of tobacco products. Thus, smoking that begins at an early age may have adverse long-term health risks. According to the Office of the Surgeon General (2012), each year more adolescents choose to use tobacco. A study conducted in 2009 found that one in four high school seniors is a regular cigarette smoker (Youth Risk Behavior Survey, 2009 as cited in Office of the Surgeon General, 2012). In *Preventing Tobacco Use Among Youth and Young Adults*, the U.S. Department of Health and Human Services reported that on average most current adult smokers smoked their first cigarette by the time they turned 16 years old [Office of the Surgeon General, 2012 (Ch. 3)]. In 2011, the Centers for Disease Control and Prevention estimated that 18.1% of high school and 4.3% of middle school students in the U.S. were active cigarette smokers (CDC, n.d.). As tobacco is the largest cause of preventable death in the world (CDC, n.d.), public health organizations and scholars have researched factors influencing tobacco use in an effort to understand user populations. One branch of the research, outlined below, has focused on the marketing of tobacco products and their accessibility, particularly to youth.

When smoking rates began to steadily decrease in the late 1990s (Office of the Surgeon General, 2012), tobacco companies responded by increasing their tobacco marketing budgets in an attempt to attract new smokers. In 2008, the top five tobacco companies in the U.S. spent about 9.94 billion dollars to market cigarettes. Of this money, \$7.2 billion was spent on reducing the prices of cigarettes via promotions and retailer discounts; the rest was dedicated to print and point of sale advertisements (FTC, 2011). These marketing efforts have been connected to a rise in youth smoking rates. Studies have shown that children who start to smoke have a preferred brand relative to the cigarette advertising they see in tobacco retailers (Wakefield *et. al.*, 2002) (See



Figure 1: A comparison of common tobacco products and the packaging they mimic.

Figure 1)]. In 2006, a Supreme Court case against tobacco companies resulted in the ruling that tobacco companies had violated the Racketeer Influenced and Corrupt Organizations Act by advertising to minors (*United States v. Philip Morris*, 2006). As most marketing is done at stores that sell tobacco products, research has aimed to find connections between tobacco retailer density and youth smoking rates.

Licensed tobacco retailers (LTRs), such as convenience stores, are common locations for tobacco advertising.

According to the Center for Tobacco Policy and Organizing, cigarette sales in 2010 accounted for \$576,354 in revenues per convenience store, accounting for a little over one-third

of their total sales (Center for Tobacco Policy and Organizing, 2011). LTRs are given incentives to heavily

advertise tobacco by the tobacco companies themselves. The term for this profuse marketing is “powerwall” (See Figure 2). Convenience store owners can be compensated up to \$20,000 yearly for complying with the marketing programs of tobacco companies (Bloom, 2001). A 2012 study of LTRs in New York State found that 95% of all retailers had interior tobacco advertising (Girlando *et al.*, 2007). In recent years, the Dollar General and the Family Dollar companies have begun selling

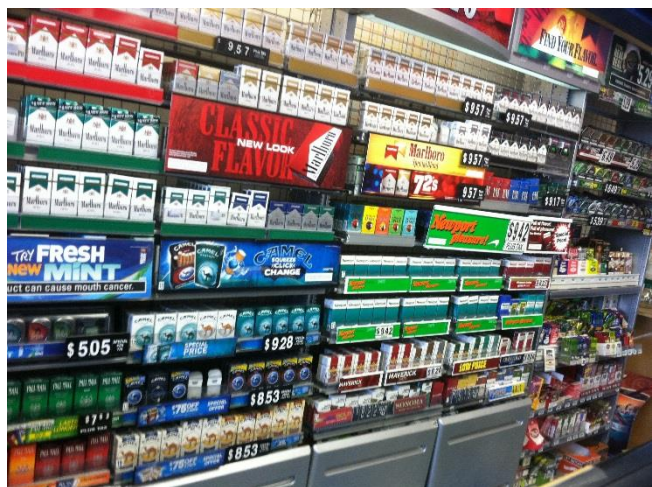


Figure 2: A typical "powerwall in a convenient market

tobacco products in their stores. From a business perspective, tobacco sales drive up sales of other products as cigarette-buying customers account for more foot traffic and more purchases of other consumables, like snacks and candy (Touryalai, 2013). Recently, a major convenience-pharmacy hybrid company has decided to close the door on tobacco and accept a loss of about two billion dollars in annual revenue. CVS Caremark pharmacies have publicly announced that selling cigarettes and medicine “undermines the mission of promoting good health” and in turn the company will lose about \$2 billion in annual revenue (Benen, 2014; Aleccia, 2014).

Several studies have examined the relationship between the density of these highly advertised and frequently-visited-by-youth stores and youth smoking rates. One particular 2005-2006 study (Henriksen *et al.*, 2008) of almost 25,000 high school students identified the boundaries of high school neighborhoods (a one-half mile radius is commonly used in health studies to characterize environmental contributions to health behaviors) and the number of LTRs in the vicinity. The study found that smoking prevalence was 3.2% higher in schools with the highest tobacco outlet density.

These studies and statistics illustrate that youth are highly impressionable by tobacco advertising. However, it is important to note that there are many determining factors that contribute to an adolescent’s decision to become a smoker. The U.S. Department of Health and Human Services (2013) lists other risk factors such as low self-esteem, stress, and smoking by parents as additional influential factors.

Methods

Using ArcGIS, a geographic information systems software, we mapped the locations of licensed tobacco retailers and schools as well as health, demographic and other variables for three counties in New York State: Madison, Herkimer, and Oneida. We used the “geocoding” and the “add XY data” functions to pin drop the retailer and school locations based on street addresses and XY coordinates. We created choropleth maps to visualize population, educational attainment, poverty, and health data. To calculate the percentage of retailers within one-half mile and a one mile radius from schools, we used the “buffer” tool and “select by location” function to determine the number of retailers that are located within these radii.

Data Sources

BRiDGES Tobacco Prevention Team

The licensed tobacco retailers’ X and Y coordinates were collected by this collaborative team. In Herkimer County, 61 of the 69 retailers’ addresses (88%) were mapped. Some addresses were given as a P.O. Box, and therefore could not be mapped. Additionally, there were a few retailers that had closed between the start and

finish of the project. In Madison County, all 60 retailers were successfully plotted. In Oneida County, we were able to successfully plot all 230 retailers.

2010 U.S. Census and American Community Survey 5-Year Estimates (2007-2011)

Population data for the three counties was obtained from the U.S. Census Bureau. The U.S. decennial census is conducted every ten years and is a reliable source of demographic data. Population less than 18 years old was obtained from the 2010 census and mapped.

The American Community Survey (ACS) is an ongoing survey conducted by the U.S. Census Bureau. A random sample of about 250,000 addresses monthly (3 million per year) are selected to receive questionnaires that seek to understand how the U.S. population lives. An important limitation of ACS is that because the sample size is so small, estimates for small scale geographies (e.g. census tracts) are sometimes unreliable or unstable. For this study, educational attainment and poverty data were obtained from the 2007-2011 ACS. Percent of the population without a high school degree was calculated by summing the estimates of the categories: educational attainment “less than 9th grade” and “9th to 12th grade, no diploma.” The total was then divided by the total population 25 years and over (the population for which these variables apply) to obtain the percentage of population 25 years and over without a high school degree. The poverty data represent the “percentage of families and people whose income in the last 12 months is below the poverty level” for all people. “Past 12 months” refers to the 12 months prior to the particular survey being conducted. Therefore, some respondents’ past-12-month time frame is different from others for the 5-year estimate.

New York State Department of Education

School addresses were obtained from the New York State Education Department’s New York State Report Cards website (<https://reportcards.nysed.gov/>).

New York State Department of Health (NYSDOH)

The data for asthma hospital discharge rates between 2008 and 2010 includes rates of asthma per 10,000 people for the total population. These data were originally gathered by the Statewide Planning and Research Cooperative System (SPARCS) and were used to create publicly accessible ZIP code level data for asthma hospital discharge rates organized by counties within New York State. The data refer to the three-year period 2008 to 2010. Data for a ZIP code that crosses county boundaries are allocated to the county that contains the largest geographic portion of that ZIP code.

The data have several limitations. First, the data are aggregated to ZIP codes to protect confidentiality. ZIP codes are a problematic geographic unit because they do not align with city, town, census tract, county, or neighborhood boundaries, making geographical comparisons difficult. Second, these data only account for the people who seek treatment through the emergency room. There may be people who have asthma that simply go to a primary care provider, rather than seek care at a hospital. Similarly, cases may be so few in some ZIP codes that the rate is unstable and therefore suppressed and not reported.

Lung and bronchus cancer case data show lung and bronchus cancer cases by ZIP code between 2005 and 2009. The data are collected by physicians, dentists, laboratories, and other healthcare providers. Health care providers must notify the NYSDOH of every case of cancer or other malignant disease. Through this registry, the NYSDOH collects, processes and reports information about New Yorkers diagnosed with cancer. Cancer

case data are only publicly available at the ZIP code level because the NYSDOH must keep information about individuals with cancer confidential to protect their privacy.

Like asthma rates, there are some limitations with lung and bronchus cancer data. Cancer is more common in elderly people, so the age of the people who live in a ZIP Code can influence the cancer rate. The expected number of cases is the number of people in a given ZIP code that would be expected to develop cancer within a five-year period if the ZIP code had the same incidence rate of cancer as the entire state. Rates used to calculate the expected number of cases takes into account age and population size by using age adjustment. The NYSDOH recognizes that the data cannot conclusively show the causes of cancer, considering most cancers appear five to forty years after exposure to a cancer causing substance. Lastly, many people move throughout their lifetime making it difficult to link exposures to environmental exposures.

Results

Herkimer County

Herkimer County Profile	
Population, 2010	64,519
Land area in square miles, 2010	1,411.47
Persons per square mile, 2010	45.7
Persons under 18 years, 2012	21.4%
High school graduate or higher, percent of persons age 25+, 2008-2012	88.4%
Persons below poverty level, percent, 2008-2012	14.6%

US Census Bureau's State and County QuickFacts, <http://quickfacts.census.gov/>

Herkimer County has 69 licensed tobacco retailers, however only 61 were mapped due to difficulties locating eight of the LTRs (See Map 1). Of the 61 mapped LTRs, 28 (46%) are located within one-half mile from a school and 46 (75%) are located within one mile from a school (this number includes the previously mentioned 28 retailers). Remington Elementary School has the highest number of licensed tobacco retailers (9) located within one-half mile from the school grounds. Herkimer High School has the greatest number of licensed tobacco retailers (12) within one mile from the school grounds (See Table 1). Many of LTRs are located in the Town of Herkimer, which has the largest population in the county (See Map 2). The Town of Herkimer also has the highest rate of people living below the poverty level, as reported by the 2007-2011 American Community Survey 5-year estimate (See Map 7).

Five of the 61 LTRs (8%) are Family Dollar and Dollar General stores and are located in the Ilion-Herkimer-Mohawk-Little Falls corridor where the population is highest (See Map 3).

During the period 2008-2010, the asthma discharge rate in Herkimer County for the population 0-17 years was less than half the NYS rate (excluding NYC) (7.6 and 15.9 per 10,000, respectively). ZIP code 13340 reported the highest rate of asthma hospital discharges, but all Herkimer County ZIP codes reported 10 or fewer hospital discharges during the 3-year time period 2008-2010 (See Map 10). Most LTRs in Herkimer County are clustered along the Frankfort-Ilion-Herkimer-Mohawk Corridor and correlate with the three ZIP codes reporting the highest asthma hospital discharge rates (13340, 13357 and 13350) (See Map 11). Similar to the asthma

trends, lung and bronchial cancer incidence in females and males is greatest in zip codes 13340, 13357, 13350, and 13365 (See Maps 12 and 13).

The New York State Department of Health lists tobacco as a risk factor of cardiovascular disease, such as heart disease and stroke. In the BRFSS Report (2009), an estimated 3,900 adults in Herkimer County (8% of the Herkimer County adult population) have been told by a health professional that he or she had a heart disease, angina, or a stroke (See Table 4).

Madison County

Madison County Profile	
Population, 2010	73,442
Land area in square miles, 2010	654.84
Persons per square mile, 2010	112.2
Persons under 18 years, 2012	20.8%
High school graduate or higher, percent of persons age 25+, 2008-2012	90.2%
Persons below poverty level, percent, 2008-2012	10.8%

US Census Bureau’s State and County QuickFacts, <http://quickfacts.census.gov/>

In Madison County there are 60 licensed tobacco retailers, of which 29 (48%) are located within one-half mile from a school and 43 (72%) are located within one mile from a school (this number includes the previously mentioned 29 retailers) (See Map 1). The greatest number of LTRs are located in the Towns of Oneida, Canastota, and Chittenango. Rural towns have relatively few retailers compared to the more densely populated towns (See Map 2). South Side Elementary School has the greatest number of licensed tobacco retailers (8) located within one-half mile from the school grounds. Canastota High School, Peterboro Street Elementary School, Roberts Street Middle School, Seneca Street Elementary School, South Side Elementary School, and Willard Prior Elementary School have the greatest number of licensed tobacco retailers (10) within one mile of school grounds (See Table 2).

Seven of the 60 LTRs (12%) in Madison County include Family Dollar and Dollar General Stores. Family Dollar and Dollar General retailers are located in Oneida, Canastota, Chittenango, Hamilton, and DeRuyter (See Map 3). Higher percentages of population living in poverty are not geographically correlated with LTR locations (See Map 7).

During the period 2008-2010, the asthma discharge rate in Madison County for the population 0-17 years was lower than the NYS rate (excluding NYC) (12.8 and 15.9, respectively). The northern portion of the county reported higher asthma hospital discharge rates than the southern portion of the county but only two ZIP codes (13032 and 13421) had more than 10 total hospital discharges. No data are available for nine ZIP codes because there were fewer than 3 discharges reported during the three-year period. ZIP code 13421, which primarily encompasses the Town of Oneida and the Oneida Indian Reservation, reported the highest asthma hospital discharge rate. ZIP code 13421 reported an asthma discharge rate of 29.2, more than double the Madison County rate (See Map 10). The higher asthma discharge rates correspond with towns that have a greater prevalence of licensed tobacco retailers (See Map 11).

The New York State Department of Health lists tobacco as a risk factor of cardiovascular disease, such as heart disease and stroke. In the BRFSS Report (2009), an estimated 5,100 adults in Madison County (9.4% of the Madison County adult population) have been told by a health professional that he or she had a heart disease, angina, or a stroke (See Table 4).

Oneida County

Oneida County Profile	
Population, 2010	234,878
Land area in square miles, 2010	1,212.43
Persons per square mile, 2010	193.7
Persons under 18 years, 2012	21.4%
High school graduate or higher, percent of persons age 25+, 2008-2012	86.4%
Persons below poverty level, percent, 2008-2012	15.6%

US Census Bureau's State and County QuickFacts, <http://quickfacts.census.gov/>

Oneida County has 230 licensed tobacco retailers (See Map 1). The greatest densities of LTRs are in the cities of Rome and Utica (See Maps 2 and 3). Poverty in Oneida County is also concentrated in Rome and Utica (See Map 8). LTRs in Oneida County are heavily concentrated around schools - 51% (117) of the 230 LTRs are located within one-half mile of schools and 86% (197) are located within one mile from a school. Martin Luther King Jr. Elementary School has the greatest number of LTRs; 20 are within one-half mile from school grounds and 52 are located within one mile from the school. Roscoe Conklin Elementary School has 42 retailers within one mile from the school, 19 of which are within one-half mile from the school. Watson Williams Elementary school has the third highest number of LTRs within one mile (38); 12 of which are within one-half mile from the school (Table 3).

Of the 230 LTRs in Oneida County, 17 are Family Dollar and Dollar General stores (See Map 4). These retailers are found primarily in Utica and Rome, as well as Sherrill, Vernon, Kirkland, Trenton and Camden.

During the period 2008-2010, the asthma discharge rate in Oneida County for the population 0-17 years was higher than the NYS rate (excluding NYC) (17.4 and 15.9, respectively). Of the three counties analyzed, Oneida is the only one to have a higher asthma discharge rate than the NYS (excluding NYC average). ZIP codes 13486 and 13490 have the highest rates in the county (See Map 11). In spite of their high asthma discharge rates, ZIP codes 13486 and 13490 do not contain any licensed tobacco retailers. A significant number of LTRs can be found, however, in ZIP codes 13340 and 13501 where the asthma discharge rate ranges between 15.4 and 28.2. Only ZIP codes 13440, 13501 and 13502 have more than 10 hospital discharges (See Map 12). Similar to asthma hospital discharge rates, lung and bronchial cancer incidence for both men and women is highest in ZIP codes 13440, 13501 and 13502. These ZIP codes surround Rome and Utica and also have high numbers of LTRs (See Maps 13 and 14).

The New York State Department of Health lists tobacco as a risk factor of cardiovascular disease, such as heart disease and stroke. In the BRFSS Report (2009), an estimated 11,700 adults in Oneida County (6.5% of the Oneida County adult population) have been told by a health professional that he or she had a heart disease, angina, or a stroke (See Table 4).

Recommendations

We recommend that anti-tobacco programming target the communities that have high rates of asthma, lung and bronchial cancers as well as those communities where exposure to tobacco advertising among youth is likely to be high given the number of licensed tobacco retailers in close proximity to schools. Exposure to tobacco marketing is a primary cause of youth smoking, and therefore it is important for local governments to consider policy measures that would reduce youth exposure to the tobacco industry's marketing. Regulating the sale and marketing of tobacco products can reduce the exposure of young residents to in-store tobacco marketing by requiring tobacco retailers to limit certain tobacco displays, reducing the number of tobacco retailers in a community, or restricting the location and type of tobacco retailers. In the case of Herkimer County, the Herkimer Central School District and the Illion Central School District would be appropriate communities to target tobacco prevention efforts. In Madison County, the Canastota Central School District would also be a high priority for tobacco advertising prevention efforts. Lastly, in Oneida County, we recommend prioritizing the Utica School District.

In addition, we recommend that this report be shared with policy makers, community organizations, parents, schools, and youth to inform and educate the public about the potential consequences of tobacco use and the prevalence of licensed tobacco retailers in their communities.

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