Obesity and Food Environment in Illinois

-- Identify possible intervention options for food access

Background

High rates of obesity is a major public health problem in the United States. Obesity has important consequences on our nation’s health and economy. It is linked to a number of chronic diseases, including coronary heart disease, stroke, diabetes, and some cancers. Although the overall obesity rate among adults in Illinois only ranked 24th nationwide, rates of obesity have been increasing consistently since the mid-1970s[1]. While a roughly 4% increase a year may seem nominal, it represents thousands of people that may be adversely affected of their health status[1]. The continuously increasing rates of obesity indicating that there are some major factors in societal that have an influence on the foods people eat and the amount of physical activity[1].

The food environment is gaining recognition as a major determinant of food choices and diet-related outcomes such as obesity[1]. Thus, promising approaches to improving population-level dietary patterns and associated health outcomes as to modify the food environments are needed as possible obesity intervention[1].

This project focused on several aspects of the food environment with a potentially more direct and strong relationship with food access, and to see whether there is a geographic pattern, which is to see whether it is consistent with the obesity rate. The results of the project can serve as potential intervention options for improving the food environment to reduce the prevalence of obesity.

The food environment index is a is a scaled index which ranges from 0 (worst) to 10 (best). The food environment index consists of two indicators of the food environment with equal weight. The first one is the percentage of population that is low-income and not live around grocery stores limited access to healthy foods. The second indicator is the estimate of percentage of the population that did not have a reliable source of food during the past year.

The overall food environment index of Illinois is 8.0, which is relatively high nationwide. However, the index for different counties ranges from 4.7-9.5 indicating that there are disparities and inequity exists between counties. The general analysis showed that there is high consistency between the obesity rate and the food environment index. However, for some counties, the lower index corresponding with a lower obesity rate, indicating that a more specific aspect of the food environment needed to be assessed.

Grocery stores and Restaurants

Food Environment Index

The overall view of the obesity rate map and per 1000 population of grocery and SNAP authorized stores showed a clear reverse relationship generally, with more bright yellow colors indicating higher obesity rates turned into more dark green sections with lower per capital stores. Although the relationship is not consistent for all counties, for places with higher stores per capita have middle-high obesity rates, it can serve as a possible solution for increasing food access, especially for a population that lives far away from the grocery stores. Also, the SNAP program is an important approach for low-income to have affordable food. As for the two kinds of restaurants with different service per capital, the per capita rates was consistency for most of the counties, which cannot specifically indicate food access alone as well as for the relationship with obesity rate.

The general view of the data for other related food services showed that there are not as many similar services in Illinois. Assessing from the map, most of the services distributed on the northeast part, which is also the part have relatively lower obesity rate, and higher food environment index. There have been studies showing that the farmer’s market which sells fresh fruits and vegetables can increase the food accessibility and the intake of healthy fresh food. As for the mobile and community food service, which can provide additional access for people with low vehicle access. The success of these food services in obesity rate can be popularized to other counties, especially for those with high Social disparities and inequity.

Discussion

Methodology

- Data Source: The obesity rate and food environment index are from Illinois department of public health; the data of stores and different services restaurants per capital are from ArcGIS REST Services; the addresses of the market, food services, and healthy food grocery are from Reference USA.
- Method: Geocoding by convert the addresses of the market, stores, and food into geographic coordinates, using the method of Add XY data in order to get the most accurate display. Clip the dataset to Illinois and join with shapefiles to display the data with geographic features.
- Map output: Choropleth map showing the rate of obesity and food environment index by county, as well as for the per capital stores and restaurants. Dot distribution map showing the position of market, stores, and food services.

Results

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The use of inconsistent data of year, and the involvement of diverse food environment measures without consistency, which also have been regularly identified as key limitations in related field of research. The lacking of clear structure among all the related measures from different perspectives of food environment make it hard to identify a direct relationship and effective intervention. Also, some of the measures in the project didn’t consider for demographic data such as poverty and population, which can be confounders of the relationship.

Limitation

References