Next Stop, SNAP

SNAP/EBT Retailers Within Walking Distance of Bus and Subway Stops in Massachusetts

USDA Supplemental Nutrition Assistance Program

Putting Healthy Food Within Reach

Introduction

The purpose of this project is to determine if areas with the highest rates of household SNAP participation are also areas that have SNAP/EBT (electronic benefits transfer) card-accepting retailers within walking distance of public transportation. Massachusetts does not have the highest rate of SNAP participation, only 11% of residents in 2017 compared to New Mexico's 22% (Nchako and Cai 2018), but I chose it as a study region due to the availability of public transportation across the state. The Massachusetts Bay Transportation Authority (MBTA) services the greater Boston area and the Regional Transit Authority (RTA) has service in regions across Central and Western MA as well as Martha's Vineyard, Nantucket, and Cape Cod. Since SNAP transactions bring over $1.2 billion to the state's poorest residents and grocers (Baker and Negus 2018) it would benefit the state to increase constituent's access to SNAP/EBT retailers to increase the amount of federal money given to the state.

Results

Figure 1 ranked the census tracts by percent of households receiving SNAP. While Boston, Worcester and Springfield are areas with the most concentrated tracts with higher participation rates, participation in the program spans across the whole state. Figure 2 shows that a majority of the state has 2+ SNAP/EBT accepting stores per tract, yet there are a significant number of tracts with 0-1 participating stores. Figure 3 shows that there are very few widespread areas with high numbers of SNAP/EBT retailers within walking distance of a bus or subway stop. Figures 4-6 show the same information as Figures 1-3 but at the smaller extent of the Boston area. Figure 4 demonstrates that there is a high concentration of SNAP participating households in the Boston area. Figures 5-6 demonstrate that there is minimal observable difference between the total number of SNAP/EBT retailers and accessible SNAP/EBT retailers in the Boston area.

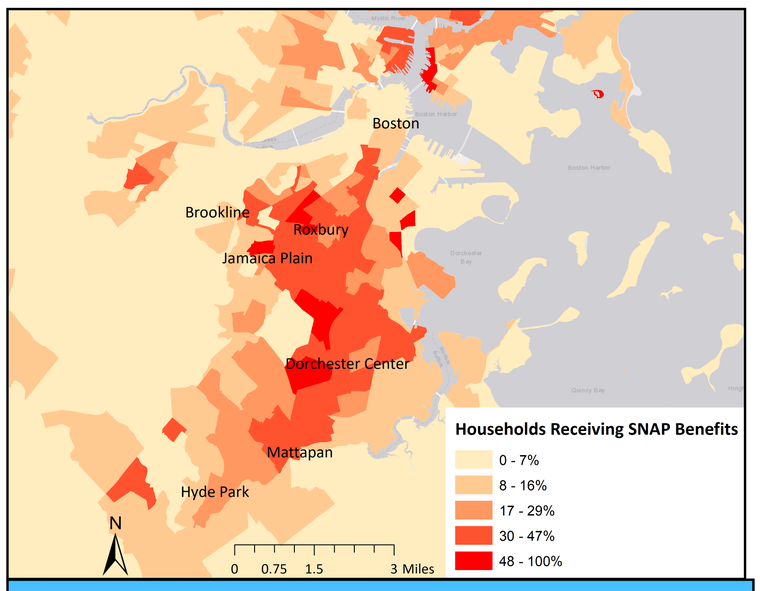

Figure 4: Boston Area's Census Tracts By SNAP Participant Population

Conclusion

There does not appear to be a direct correlation between tracts with the highest percentiles of household SNAP participation and tracts with the highest numbers of SNAP/EBT retailers. Lack of strong correlation was surprising, but a possible explanation is that the 2017 areas of high participation in SNAP have shifted from where they were in previous years, and retailers in areas with growing SNAP participant populations have not been responsive to the change so as to accept EBT. From Figure 2 to 3 there is a drastic decrease in the number of SNAP/EBT retailers when walking distance from a public transit stop is considered. This is cause for concern for those SNAP recipients who rely on public transit but reside far from blue-shaded areas shown in Fig. 3. As predicted, due to the MBTA's extensive coverage over Boston, examining Figures 5 and 6 showed insignificant change between total number of SNAP retailers in a tract and the number of retailers accessible by public transit. Despite the relative accessibility of participating stores across the Boston area, this trend is not mimicked across the rest of the state. Areas shaded blue in Fig. 3 do not necessarily signify the presence of a sufficient amount of participating stores. My overall takeaway from this analysis is that it appears that there is a state-wide need for an increased number of SNAP/EBT retailers and that there is a lack of transit-accessible SNAP/EBT retailers in some parts of the state which demonstrate need for them.

Methods

ArcMap program version 10.6.1 was used. To create Figure 1 I first performed an attribute join with the "CENSUS2010TRACTS_POLY" shapefile and the "ACS_17_5YR_S2201" table using the 11 digit geo-ID codes found in columns GEOID10 and geo.id2 respectively. To create Figure 2, the USDA table "snapretailers.csv" was geocoded to display as point data. Next, the geocoded points were spatially joined to the CENSUS2010TRACTS_POLY layer to create a count of SNAP retailers in each tract. To create Figure 3, I generated a .25 mile dissolved buffer around each of the bus stops in the MassDOT layers. One quarter mile was designated a reasonable walking distance from transit stop to destination. Multiple selections by location were performed to select for only the retailers that intersected a buffer. The selected points were then spatially joined to the original CENSUS2010TRACTS_POLY layer to create a count of stores within walking distance of a public transit stop in each census tract.

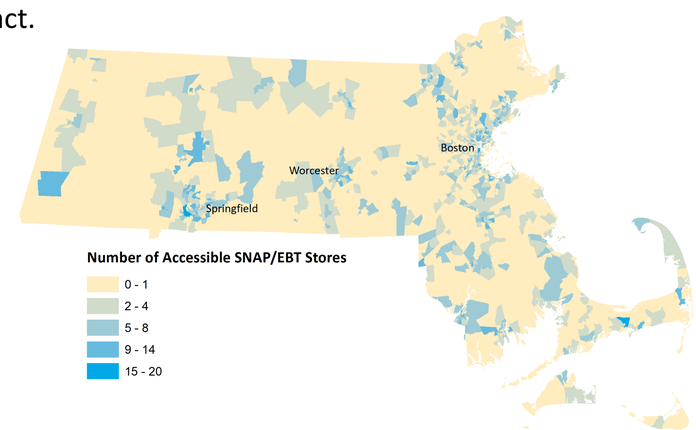

Figure 3: Number of SNAP/EBT Stores Accessible by Transit.

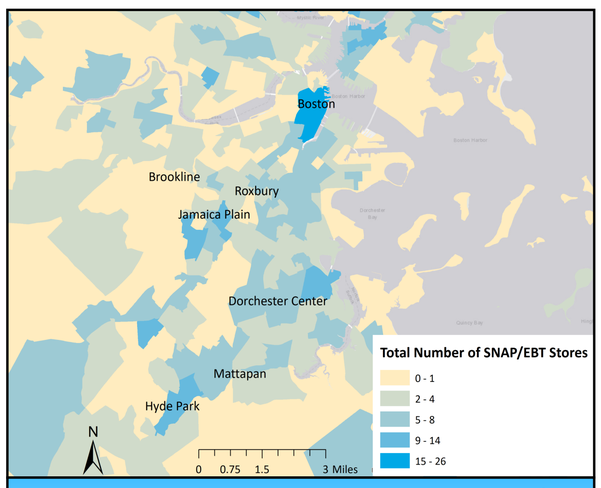

Figure 5: Number of Stores that Accept SNAP/EBT in Boston.

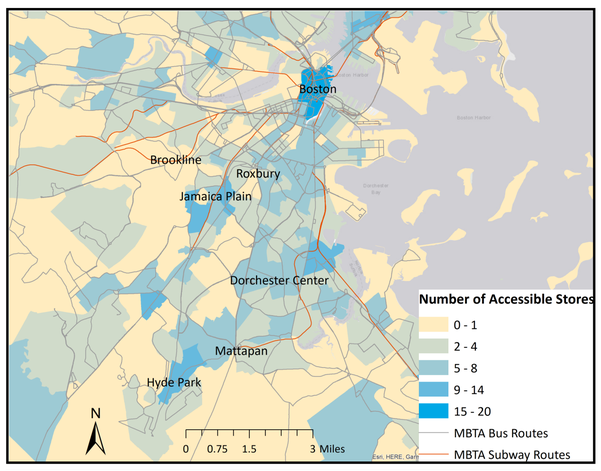

Figure 6: Boston's Census Tracts with Accessible SNAP/EBT Stores

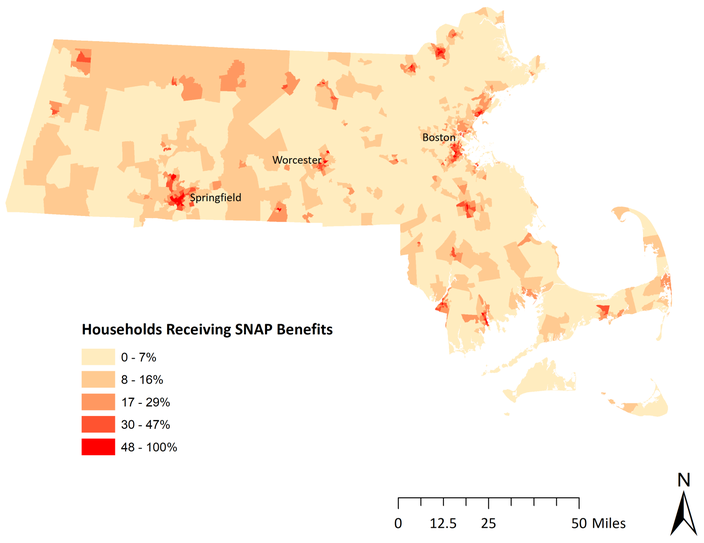

Figure 1: SNAP Participation Per Census Tract.

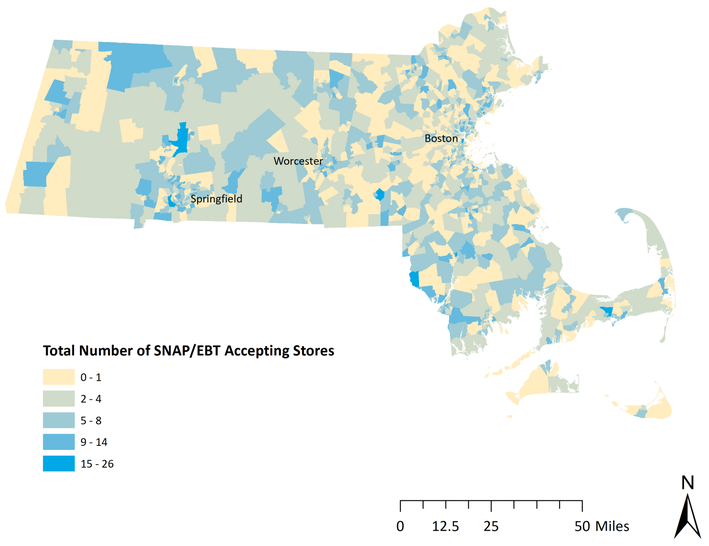

Figure 2: Number of Stores that accept SNAP/EBT.

Data

Polygon vector data from MassGIS provided boundaries of each census tract in Massachusetts. American Community Survey table ACS_17_5YR_S2201 held 2017 data on SNAP participation based on various demographics. Column HC04_EST_VC01 provided percent of total households per census tract receiving SNAP benefits.

The "snapretailers.csv" table from the USDA Food and Nutrition Service gave addresses for all SNAP/EBT accepting stores in Massachusetts as of April 2019. All MassDOT data were vector point shapefiles with locations of each bus and subway stop serviced by the MBTA and the RTA across Massachusetts.

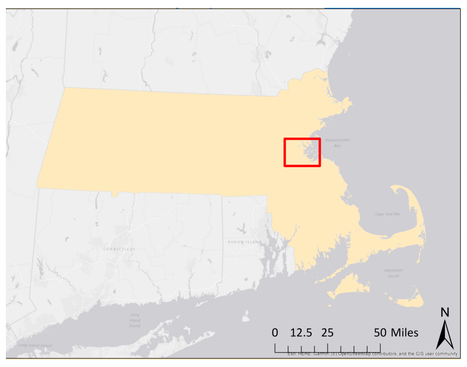

Figure 7: Location of Fig. 4-6

References

Baker, P., & Negus, V. (2018, January). About the Food Stamp/SNAP Program. Retrieved May 7, 2019, from https://www.masslegalhelp.org/income-benefits/food-stamps/advocacy-guide/introduction/about-snap-program

Massachusetts Association of Regional Transit Authorities. MARTA Logo. Retrieved May 7, 2019, from https://matransit.com/

Nchako, C., & Cai, L. (2018, December 03). A Closer Look at Who Benefits from SNAP: State-by-State Fact Sheets. Retrieved May 1, 2019, from https://www.cbpp.org/research/food-assistance/a-closer-look-at-who-benefits-from-snap-state-by-state-fact-sheets#Massachusetts

USDA Food and Nutrition Service (2013, May 07). SNAP Logo. Retrieved May 3, 2019 from https://fns-prod.azureedge.net/sites/default/files/snap/SNAP-Logo-Guidance.pdf

Cartographer: Serena Monteiro

GIS 101: Intro GIS

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Data Sources: US Census, MassGIS, MassDOT, and American Community Survey

Projection: Lambert Conformal Conic

NAD_1983_StatePlane_Massachusetts_Mainland_FIPS_2001 (Meters)