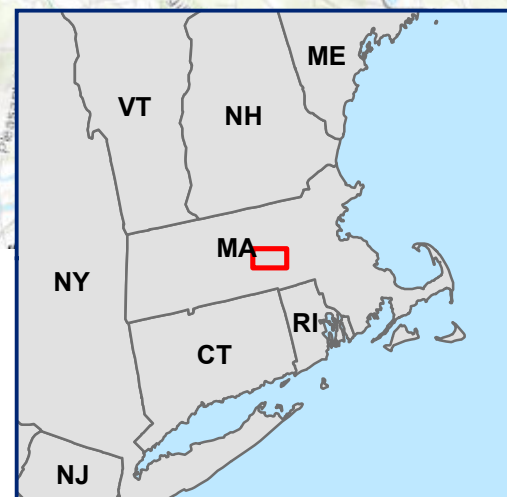
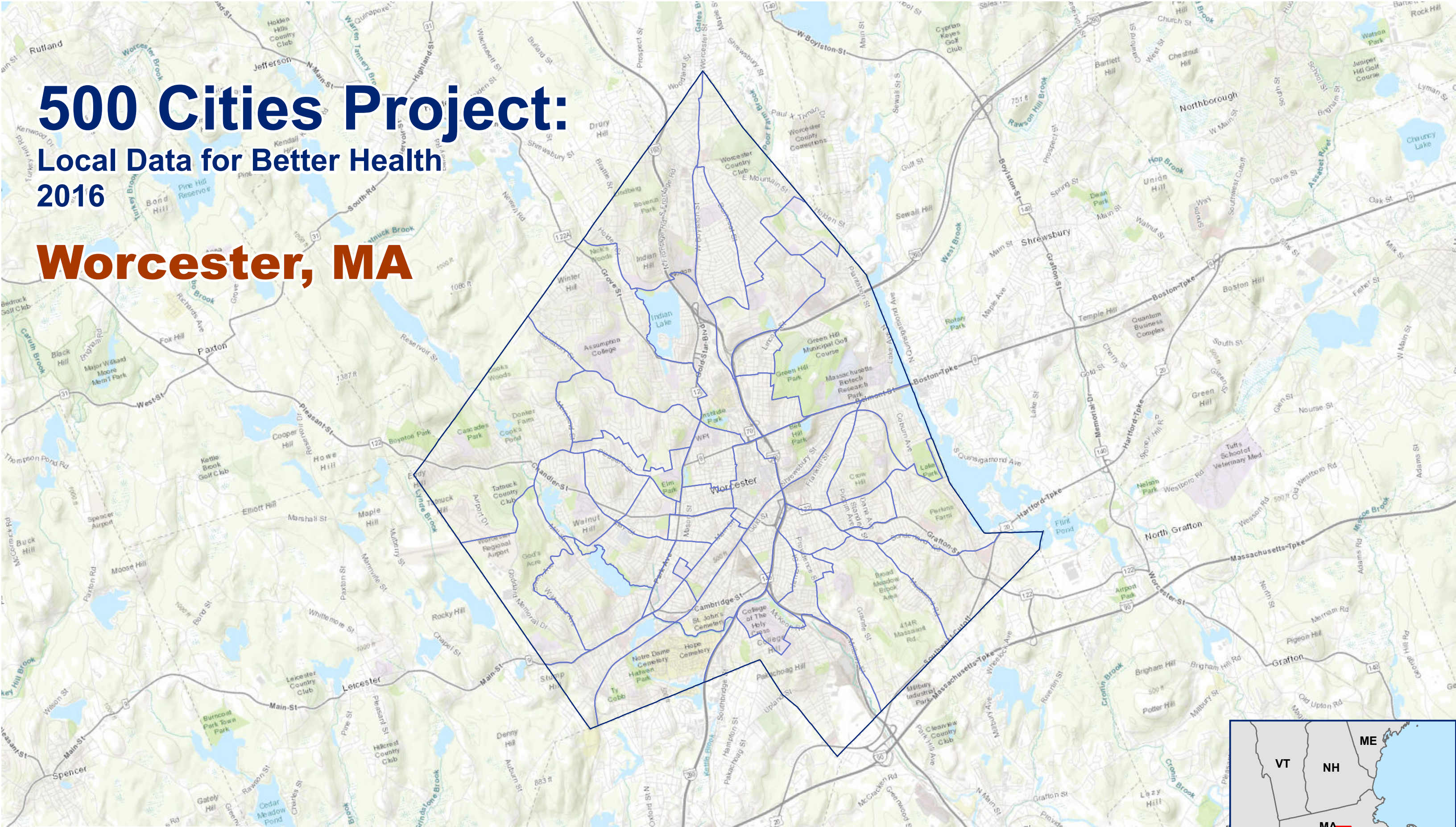


500 Cities Project:

Local Data for Better Health
2016

Worcester, MA



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September, 2018

Introduction:

The 500 Cities Project – Better Health Through Local Data – is a collaboration between the Robert Wood Johnson Foundation, the CDC Foundation, and the Centers for Disease Control and Prevention (CDC). The purpose of the project is to provide high quality small area estimates for behavioral risk factors that influence health status; for health outcomes; and the use of clinical preventive services. These estimates can be used to identify emerging health problems and to inform development and implementation of effective, targeted public health prevention activities.

Data sources:

The CDC Behavioral Risk Factor Surveillance System 2015, 2016 data. The Census Bureau 2010 census population data, American Community Survey 2011-2015 and 2012-2016 estimates. Esri ArcGIS Online basemaps.

Methodology:

CDC used small area estimation (SAE) methodology called multi-level regression and poststratification (MRP) that links geocoded health surveys and high spatial resolution population demographic and socioeconomic data to produce local level health-related estimates. This approach also accounts for the associations between individual health outcomes, individual characteristics, and spatial contexts and factors at multiple levels (e.g. state, county); predicts individual disease risk and health behaviors in a multi-level modeling framework, and estimates the geographic distributions of population disease burden and health behaviors at city and census tract levels.

Further information on the small area estimation methodology can be obtained from:

- [Multilevel Regression and Poststratification for Small-Area Estimation of Population Health Outcomes: A Case Study of Chronic Obstructive Pulmonary Disease Prevalence Using the Behavioral Risk Factor Surveillance System.\[PDF-5.53MB\]](#)
- [Validation of Multilevel Regression and Poststratification Methodology for Small Area Estimation of Health Indicators from the Behavioral Risk Factor Surveillance System.](#)
- [Comparison of Methods for Estimating Prevalence of Chronic Diseases and Health Behaviors for Small Geographic Areas: Boston Validation Study, 2013](#)

Limitations:

All data presented in this map book are model-based estimates that reflect the statistically expected prevalence of each measure. These small area estimates tend to have narrow confidence ranges and may underestimate some areas with high prevalence or overestimate some areas with low prevalence. Because the small area model cannot detect effects due to local interventions, these model-based local estimates should not be used to evaluate the effect of local public health programs, policies, or interventions.

For more information please refer to <http://www.cdc.gov/500cities/>.

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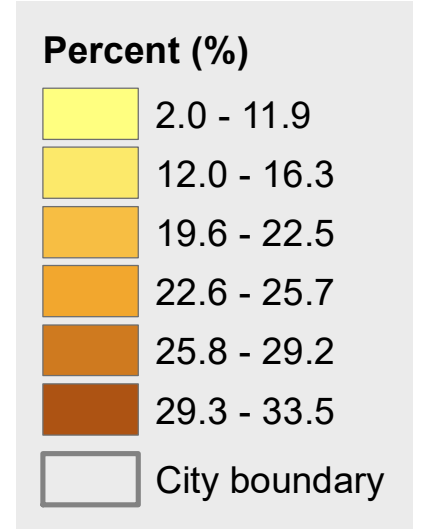
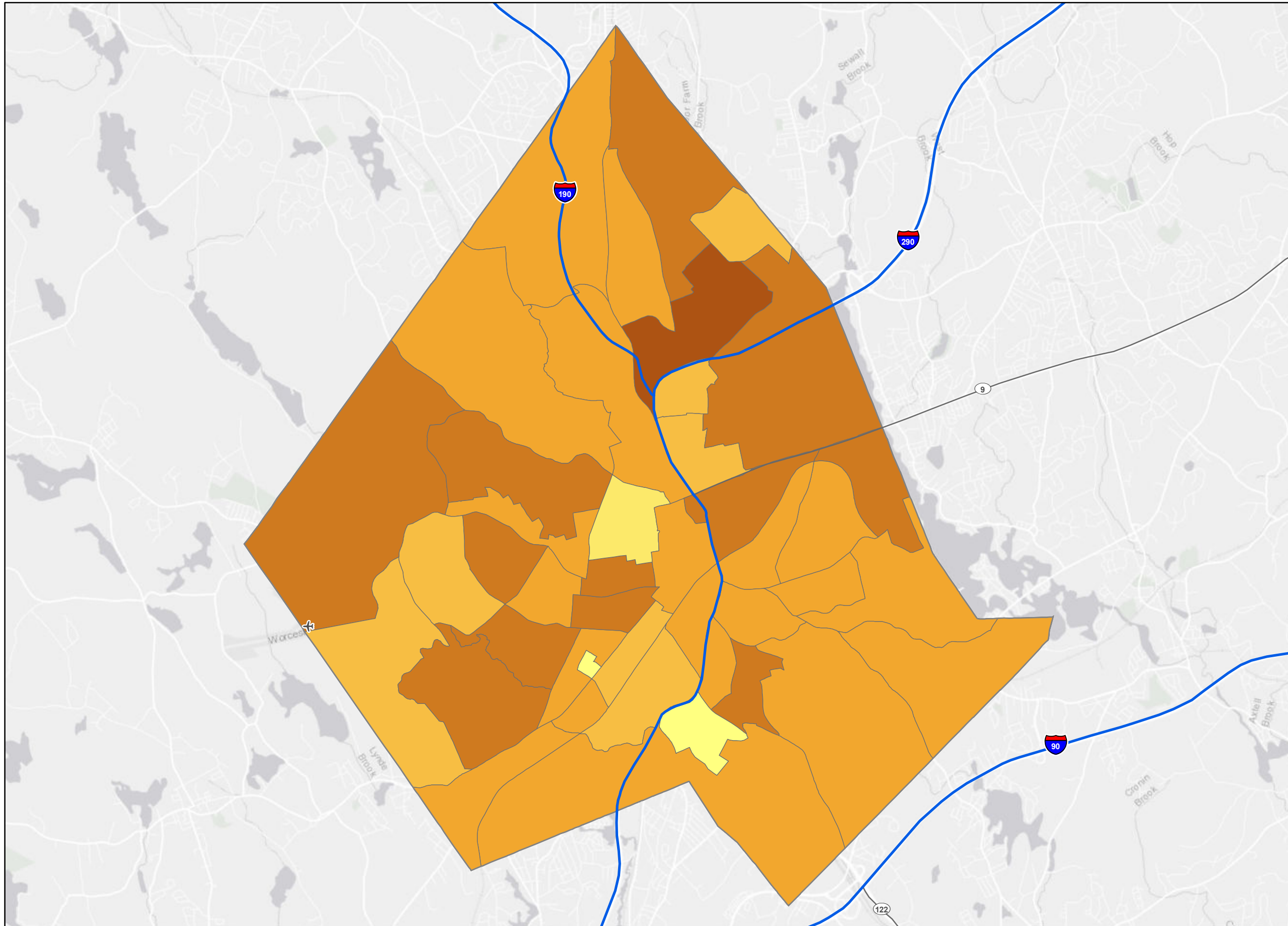
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Four of the measures were not included in the 2016 BRFSS, therefore 2015 estimates are presented here. For details on measure definitions, please refer to: <https://www.cdc.gov/500cities/measure-definitions.htm>.

Measure	Crude (%)			Age-adjusted (%)			State Age-adjusted	US Age-adjusted	Footnotes
	Prevalence	Lower 95% CI	Upper 95% CI	Prevalence	Lower 95% CI	Upper 95% CI	Prevalence (%)	Prevalence (%)	
Worcester									
MA									
Arthritis among adults aged >=18 years	24.0	23.8	24.1	25.5	25.3	25.6	22.5	23.0	
Current asthma prevalence among adults aged >=18 years	11.4	11.3	11.6	11.4	11.3	11.5	10.4	8.8	
Cancer (excluding skin cancer) among adults aged >=18 years	5.7	5.6	5.7	6.1	6.0	6.1	6.0	5.9	
High blood pressure among adults aged >=18 years	30.1	29.9	30.3	31.9	31.7	32.1	27.1	29.4	
High cholesterol among adults aged >=18 years who have been screened in the past 5 years	34.9	34.7	35.1	32.6	32.5	32.8	29.4	31.1	
Diagnosed diabetes among adults aged >=18 years	9.8	9.7	9.9	10.6	10.4	10.6	8.1	9.6	
Chronic kidney disease among adults aged >=18 years	2.8	2.8	2.8	2.9	2.9	3.0	2.2	2.7	
Chronic obstructive pulmonary disease among adults aged >=18 years	6.7	6.6	6.9	7.0	6.9	7.2	4.8	6.0	
Coronary heart disease among adults aged >=18 years	6.0	5.9	6.1	6.3	6.2	6.4	5.6	5.8	
Stroke among adults aged >=18 years	3.0	3.0	3.1	3.2	3.1	3.2	2.4	2.9	
Physical health not good for >=14 days among adults aged >=18 years	12.9	12.7	13.1	13.4	13.2	13.6	10.4	11.5	
Mental health not good for >=14 days among adults aged >=18 years	14.6	14.4	14.9	14.4	14.1	14.6	12.2	11.9	
All teeth lost among adults aged >=65 years	19.2	18.1	20.4	19.0	18.0	20.1	16.7	15.0	
Current lack of health insurance among adults aged 18-64 years	11.0	10.7	11.3	11.0	10.8	11.3	7.0	14.6	
Visits to doctor for routine checkup within the past year among adults aged >=18 years	77.4	77.2	77.5	78.0	77.9	78.1	77.3	69.7	
Visits to dentist or dental clinic among adults aged >=18 years	61.3	60.7	62.0	61.2	60.7	61.8	73.4	65.3	
Taking medicine for high blood pressure control among adults aged >=18 years with high blood pressure	74.6	74.4	74.7	61.2	61.0	61.3	58.6	57.7	
Cholesterol screening among adults aged >=18 years	73.6	73.2	74.0	76.4	76.1	76.7	80.1	75.2	
Mammography use among women aged 50-74 years	80.5	80.0	80.9	76.0	75.5	76.5	84.8	77.7	
Papanicolaou smear use among adult women aged 21-65 years	84.4	84.1	84.7	79.8	79.4	80.1	83.0	80.3	US value based on states available from BRFSS 2016
Fecal occult blood test, sigmoidoscopy, or colonoscopy among adults aged 50-75 years	65.2	64.7	65.7	66.0	65.5	66.5	70.3	64.2	
Up to date on a core set of clinical preventive services (flu shot past year, pneumococcal shot ever, colorectal cancer screening) among men aged >=65 years	31.0	30.2	31.9	31.3	30.4	32.3	31.2	35.0	
Up to date on a core set of clinical preventive services (same as men plus mammogram past 2 years) among women aged >=65 years	27.9	27.1	28.8	29.0	28.3	29.8	31.2	31.5	
Binge drinking prevalence among adults aged >=18 years	18.3	18.2	18.4	17.6	17.5	17.7	19.3	18.0	
Current smoking among adults aged >=18 years	21.1	20.6	21.6	21.5	21.0	21.9	13.9	16.8	
No leisure-time physical activity among adults aged >=18 years	26.4	26.0	26.8	27.1	26.7	27.5	19.5	23.7	
Obesity among adults aged >=18 years	28.5	28.3	28.6	29.7	29.6	29.9	23.3	29.5	
Sleeping less than 7 hours among adults aged >=18 years	38.2	37.9	38.4	38.6	38.4	38.8	33.6	35.1	

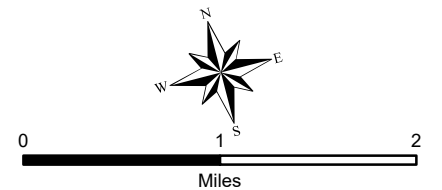
Health Outcomes

Arthritis among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

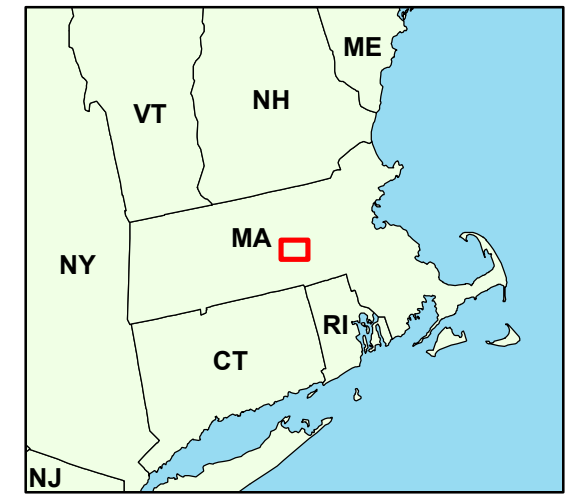


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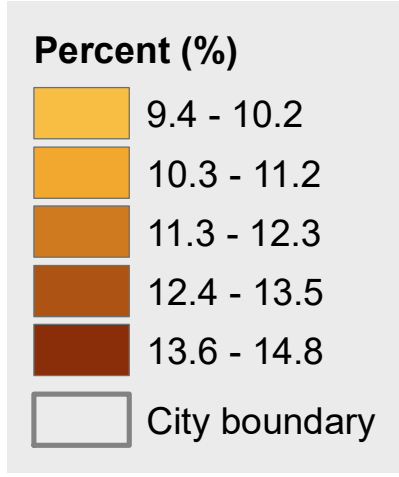
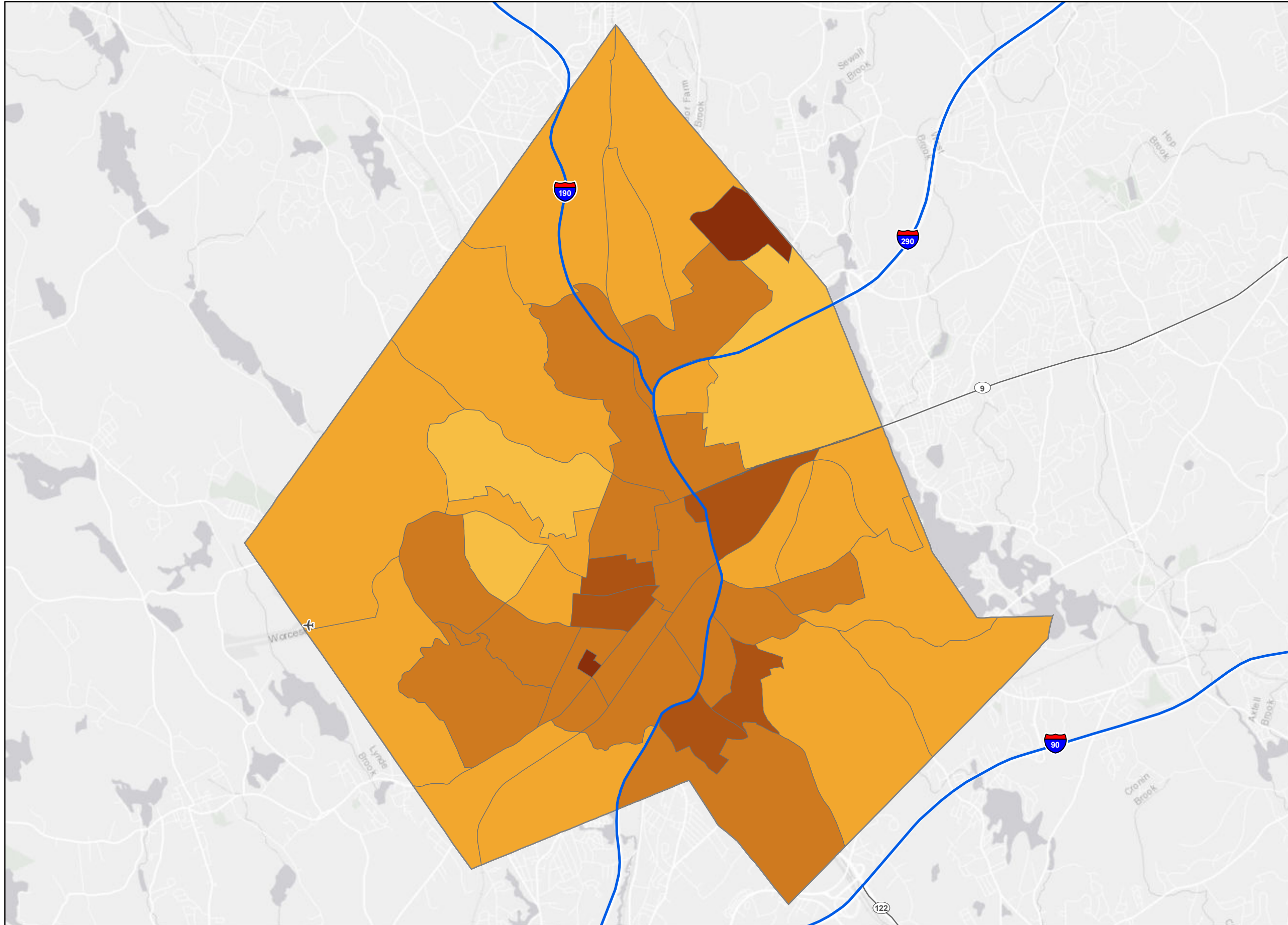
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Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

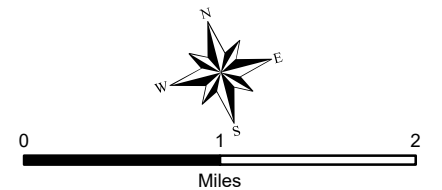


Current asthma prevalence among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

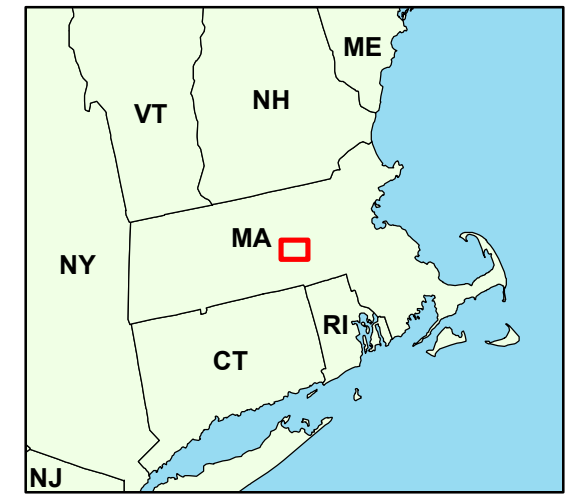


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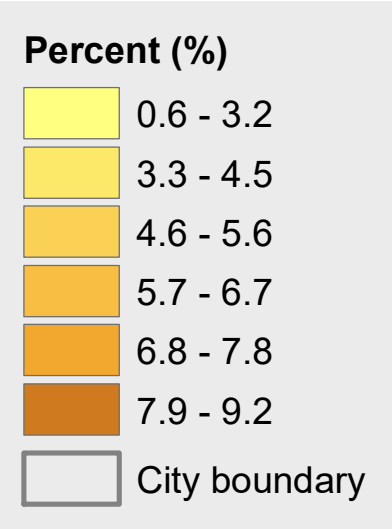
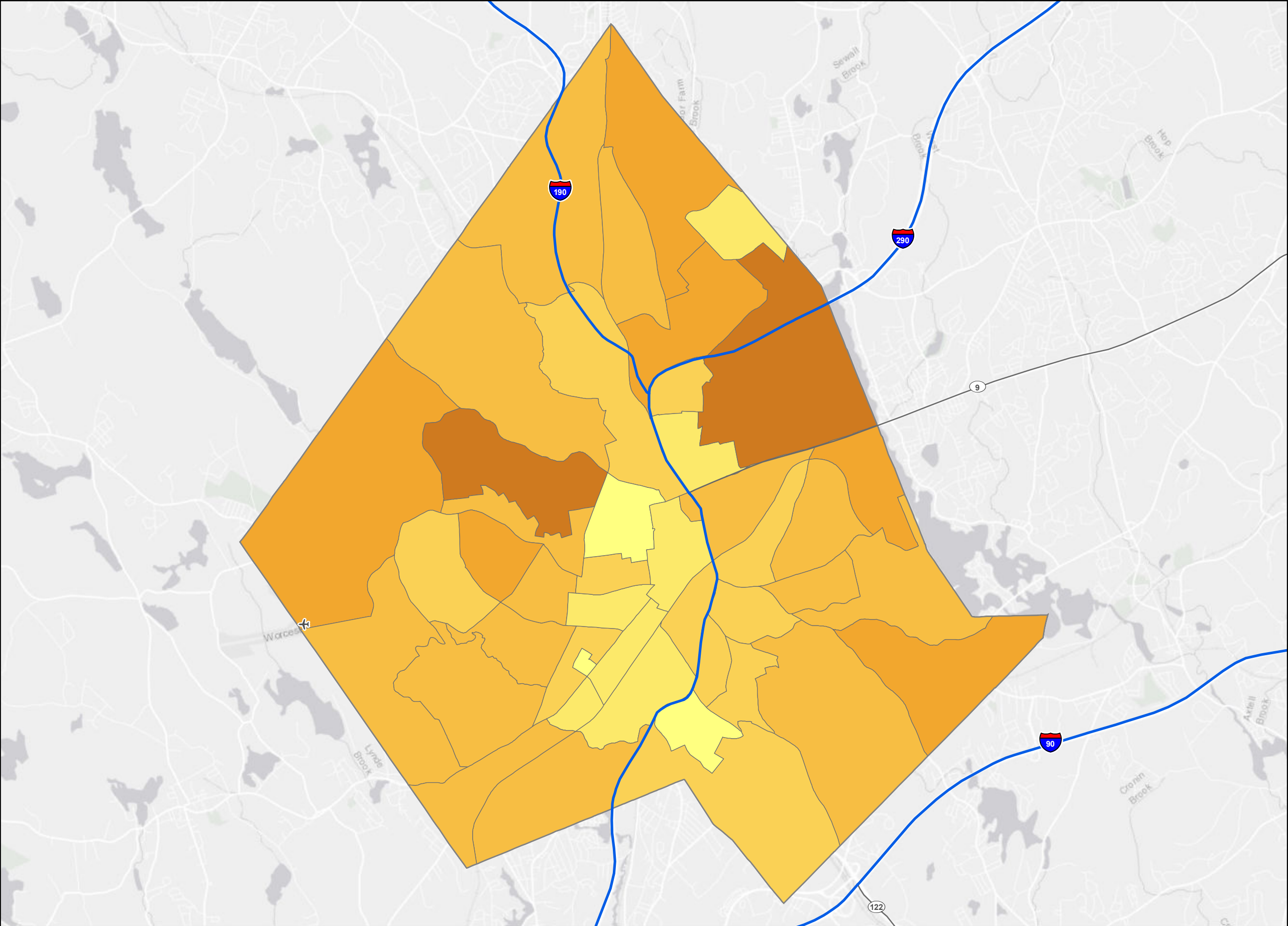
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Data sources:
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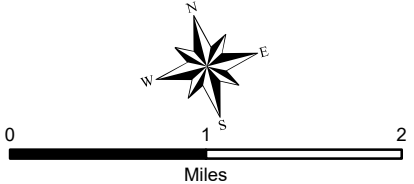


Cancer (excluding skin cancer) among adults aged ≥18 years by census tract, Worcester, MA, 2016



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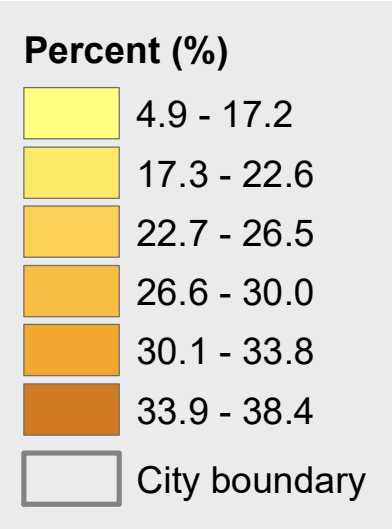
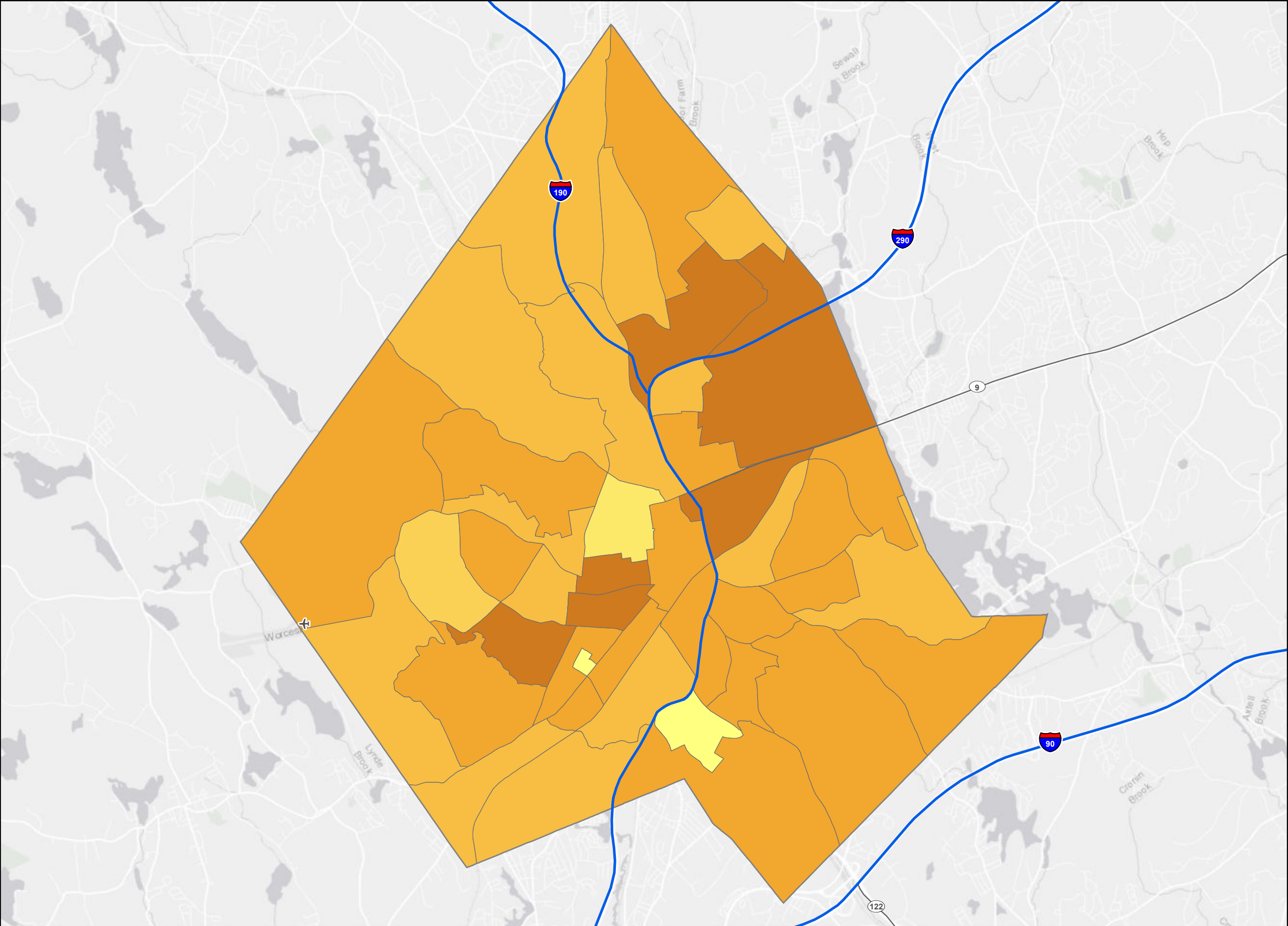
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Data sources:
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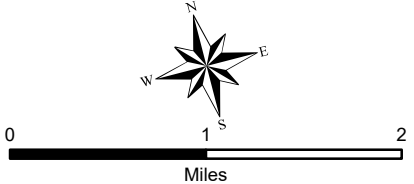


High blood pressure among adults aged ≥ 18 years by census tract, Worcester, MA, 2015



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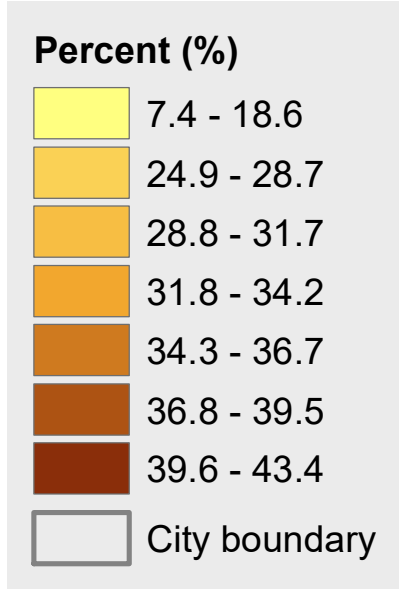
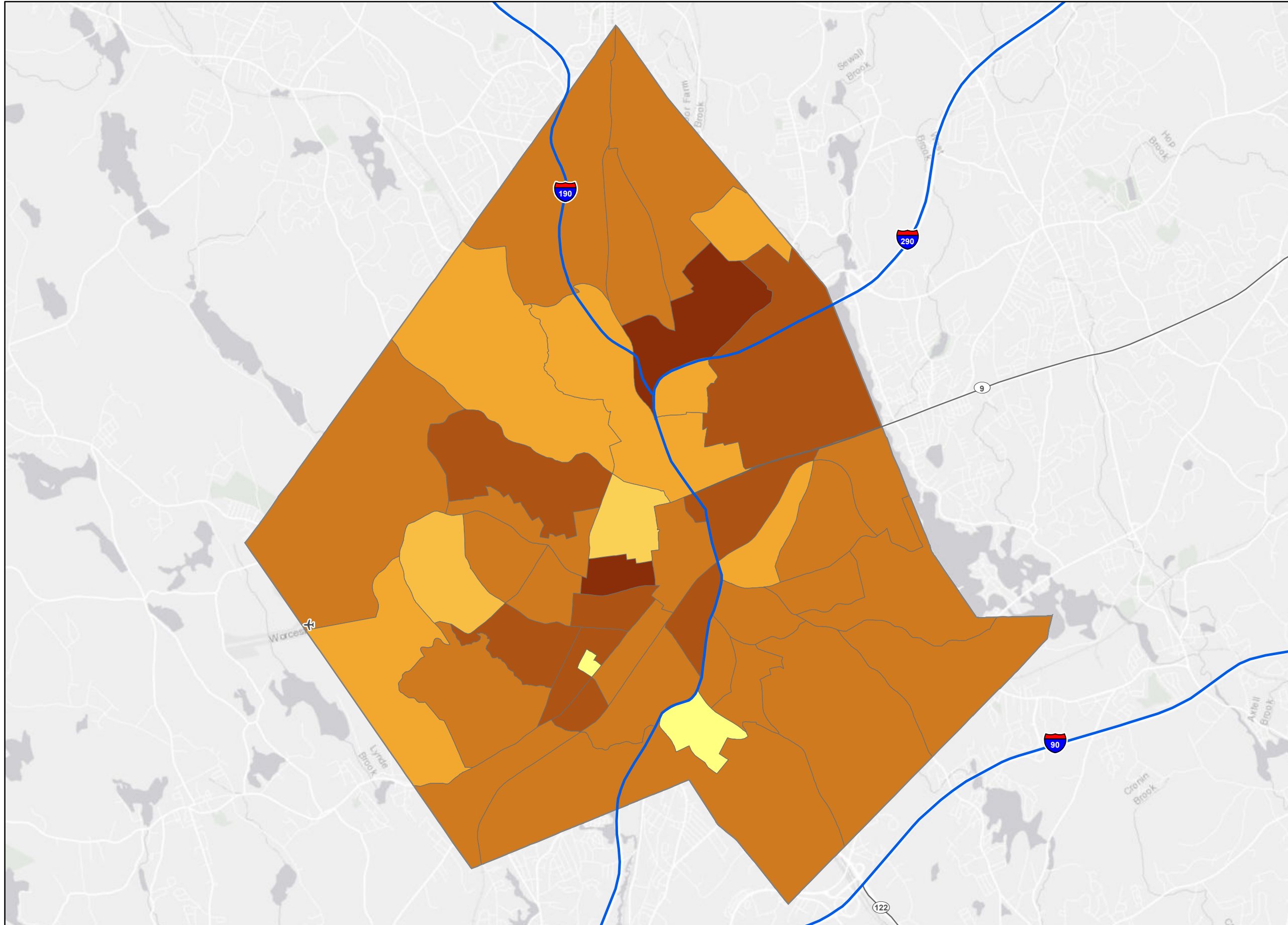
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Data sources:
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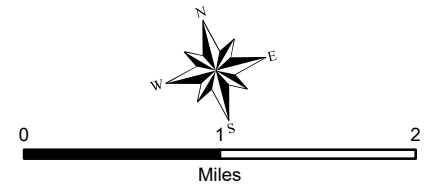


High cholesterol among adults aged ≥ 18 years who have been screened in the past 5 years by census tract, Worcester, MA, 2015



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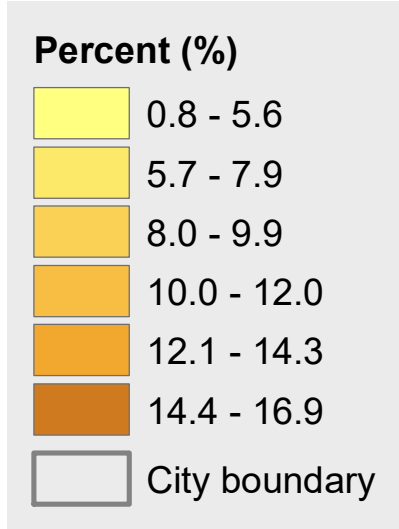
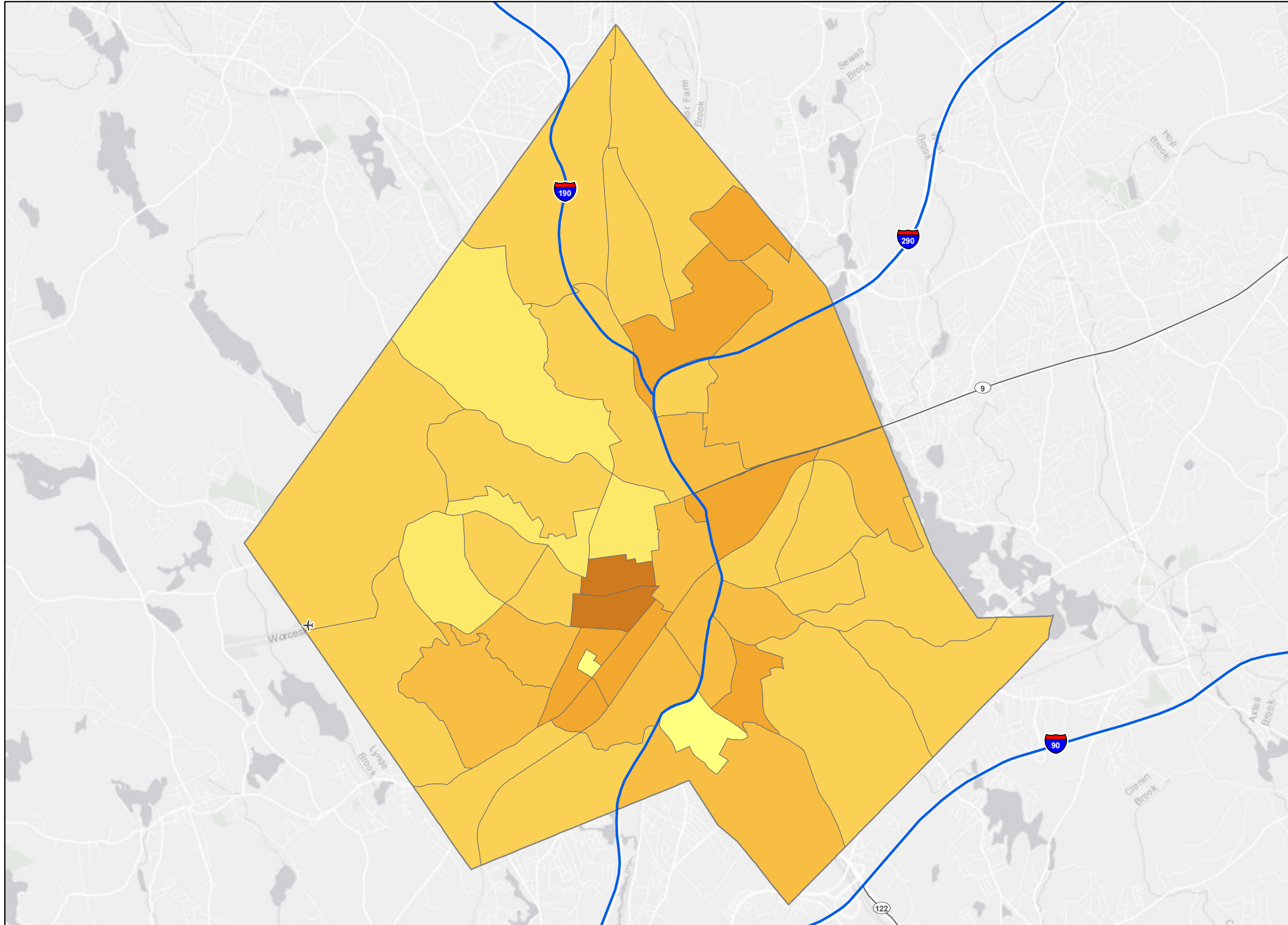
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Data sources:
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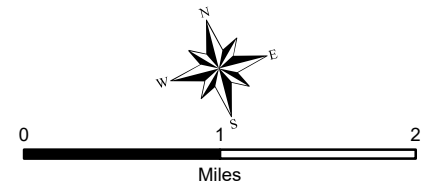


Diagnosed diabetes among adults aged ≥ 18 years by census tract, Worcester, MA, 2016



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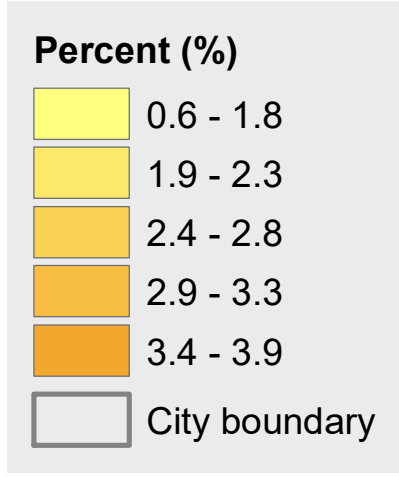
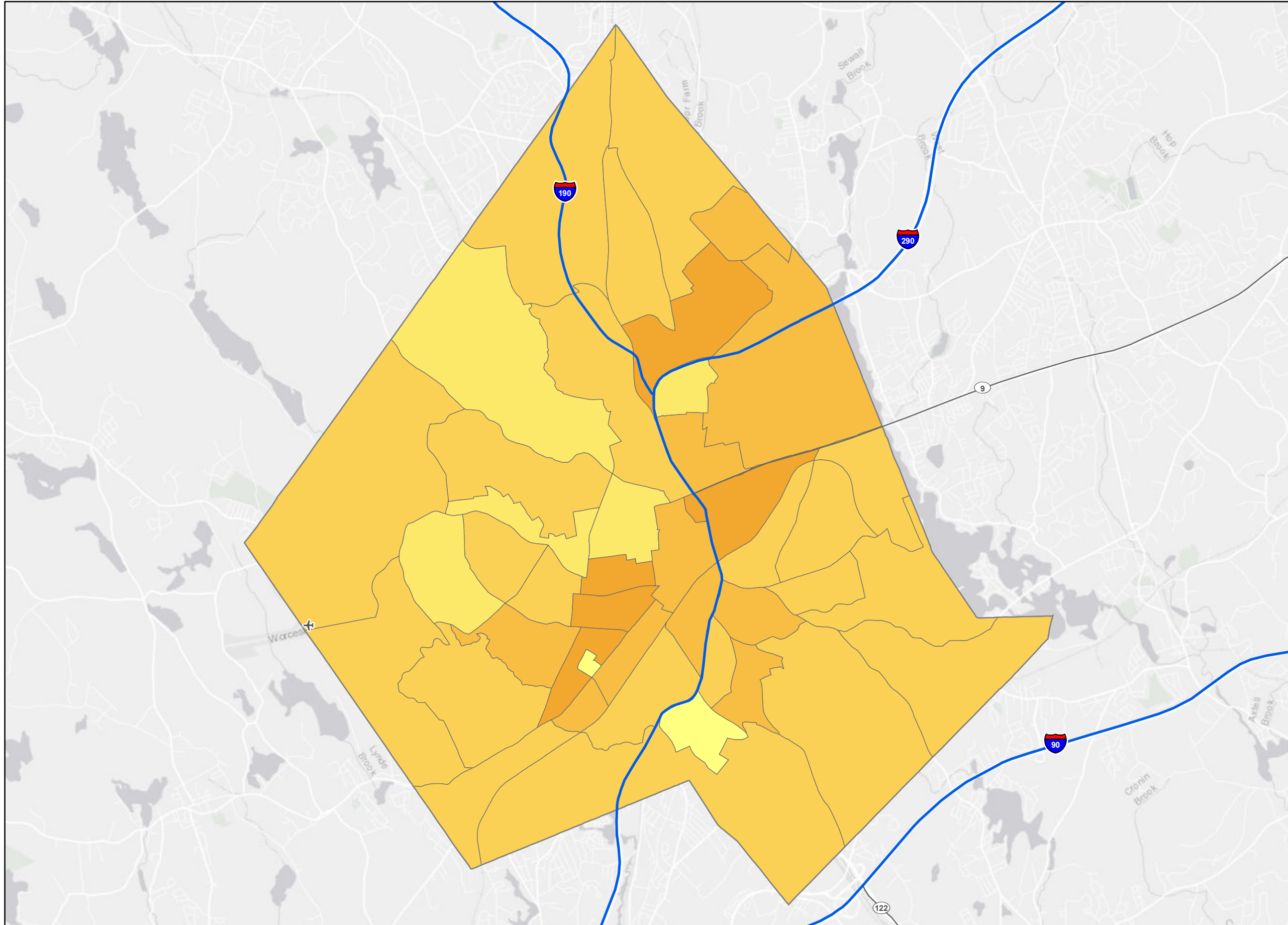
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Data sources:
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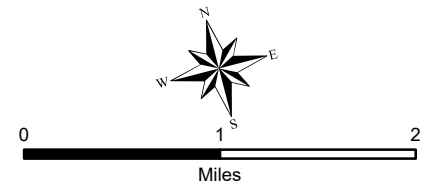


Chronic kidney disease among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

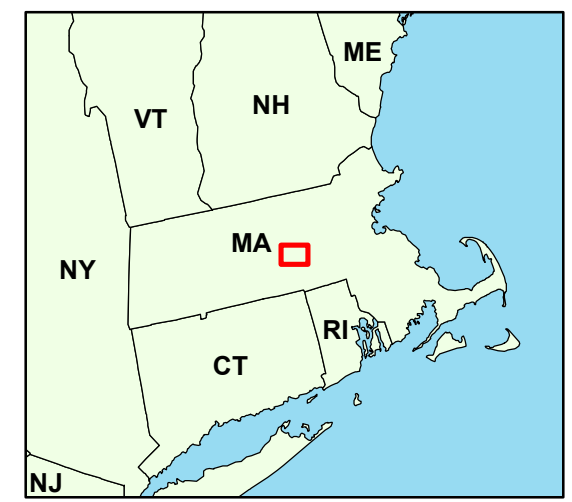


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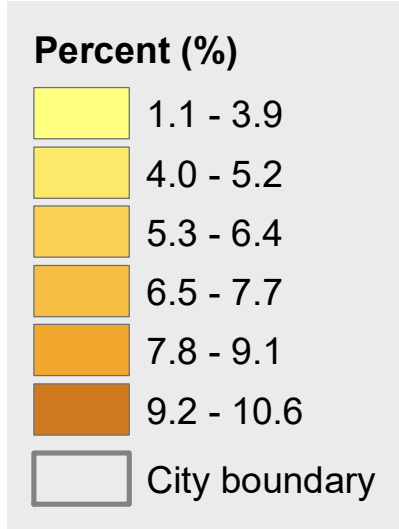
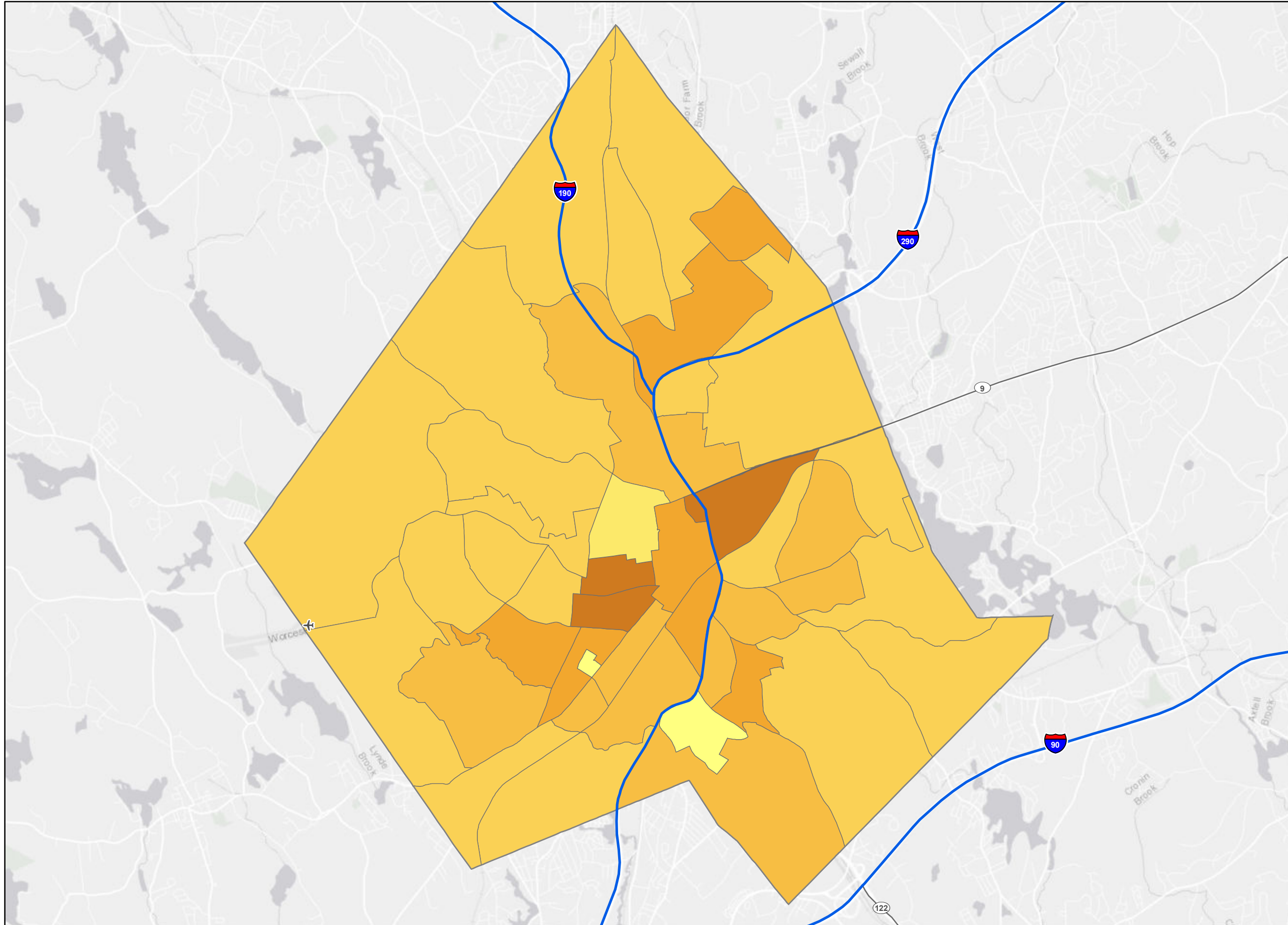
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Data sources:
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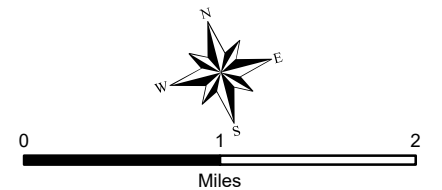


Chronic obstructive pulmonary disease among adults aged ≥ 18 years by census tract, Worcester, MA, 2016



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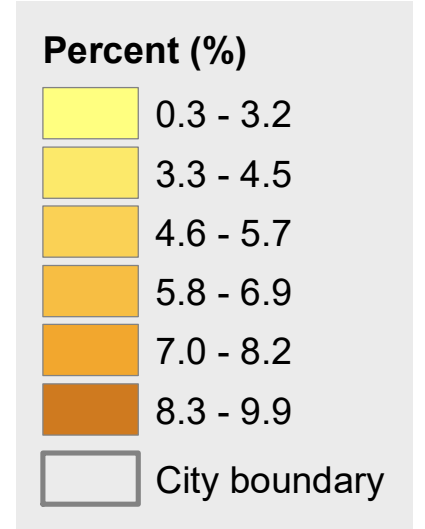
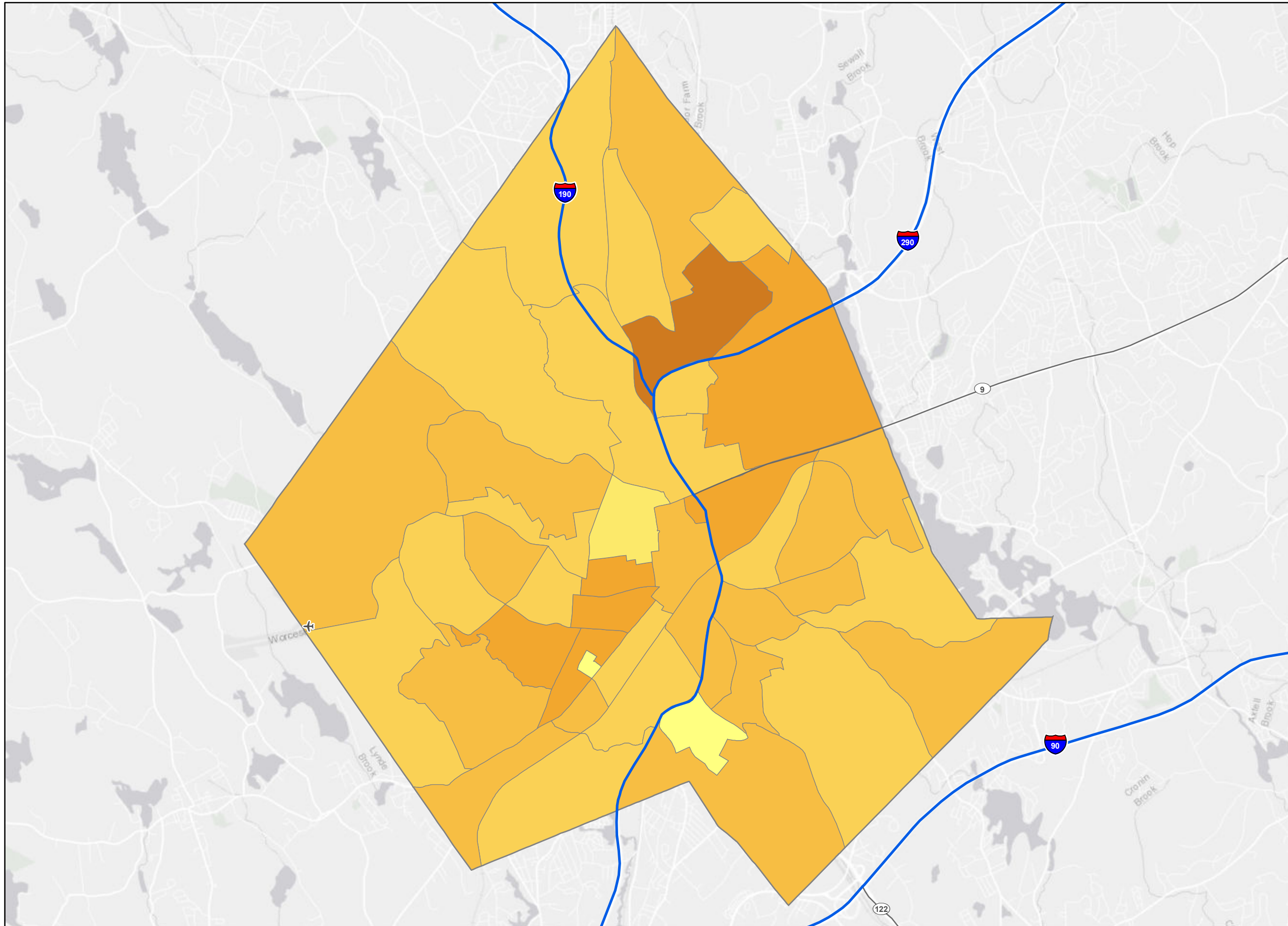
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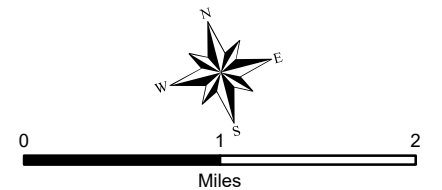


Coronary heart disease among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

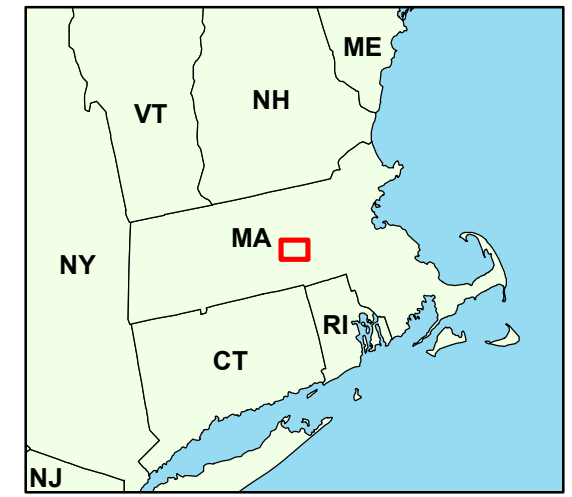


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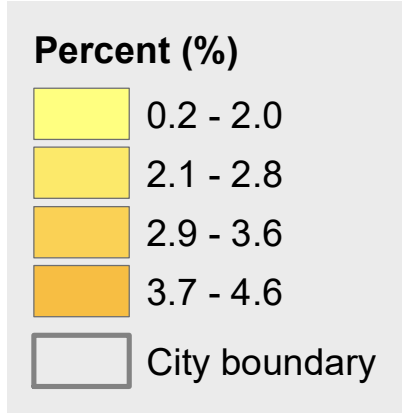
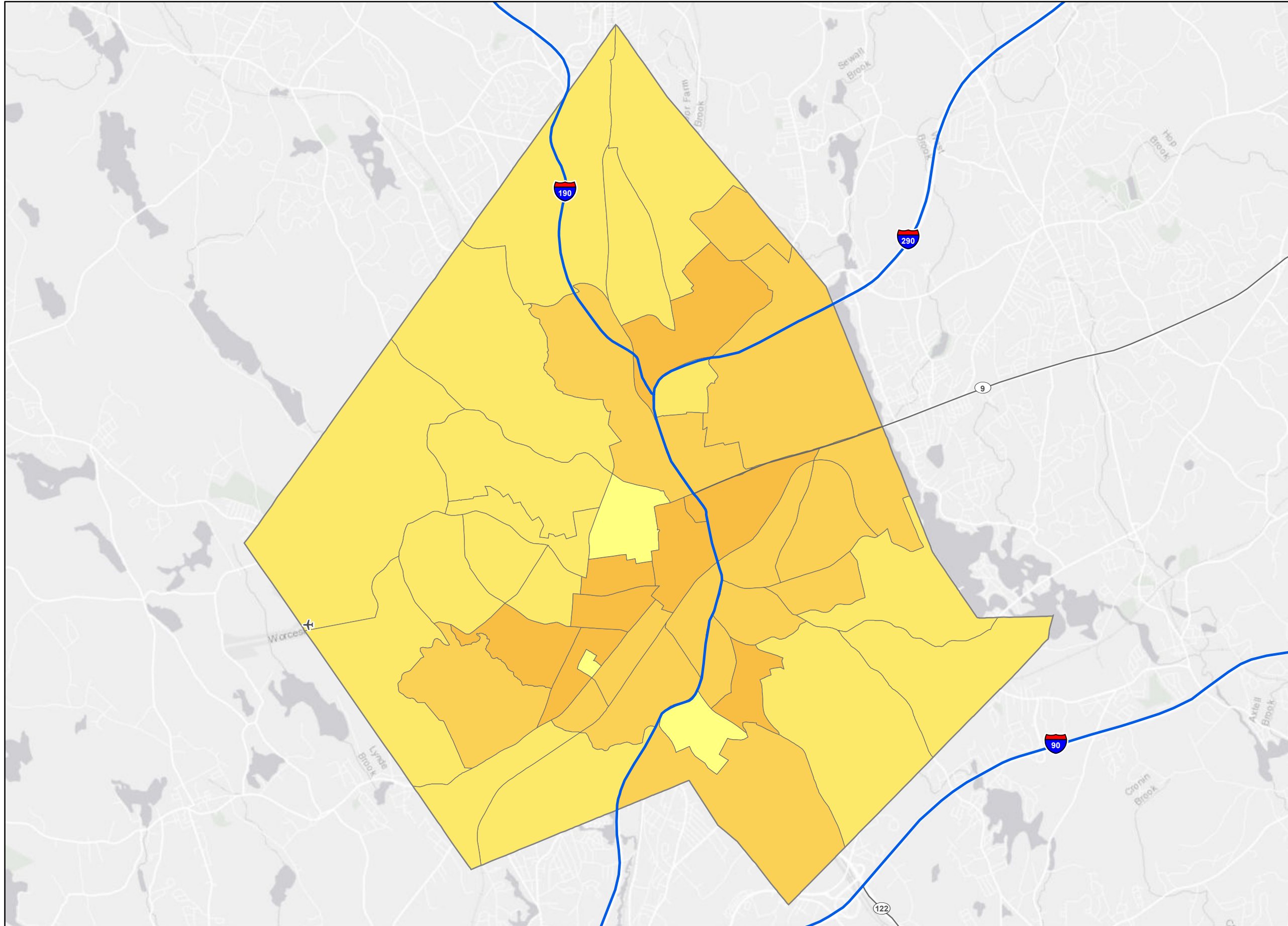
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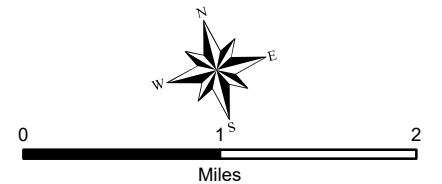


Stroke among adults aged 18 years and older by census tract, Worcester, MA, 2016



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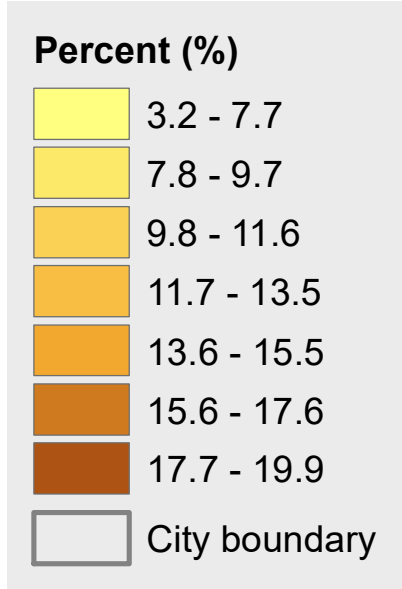
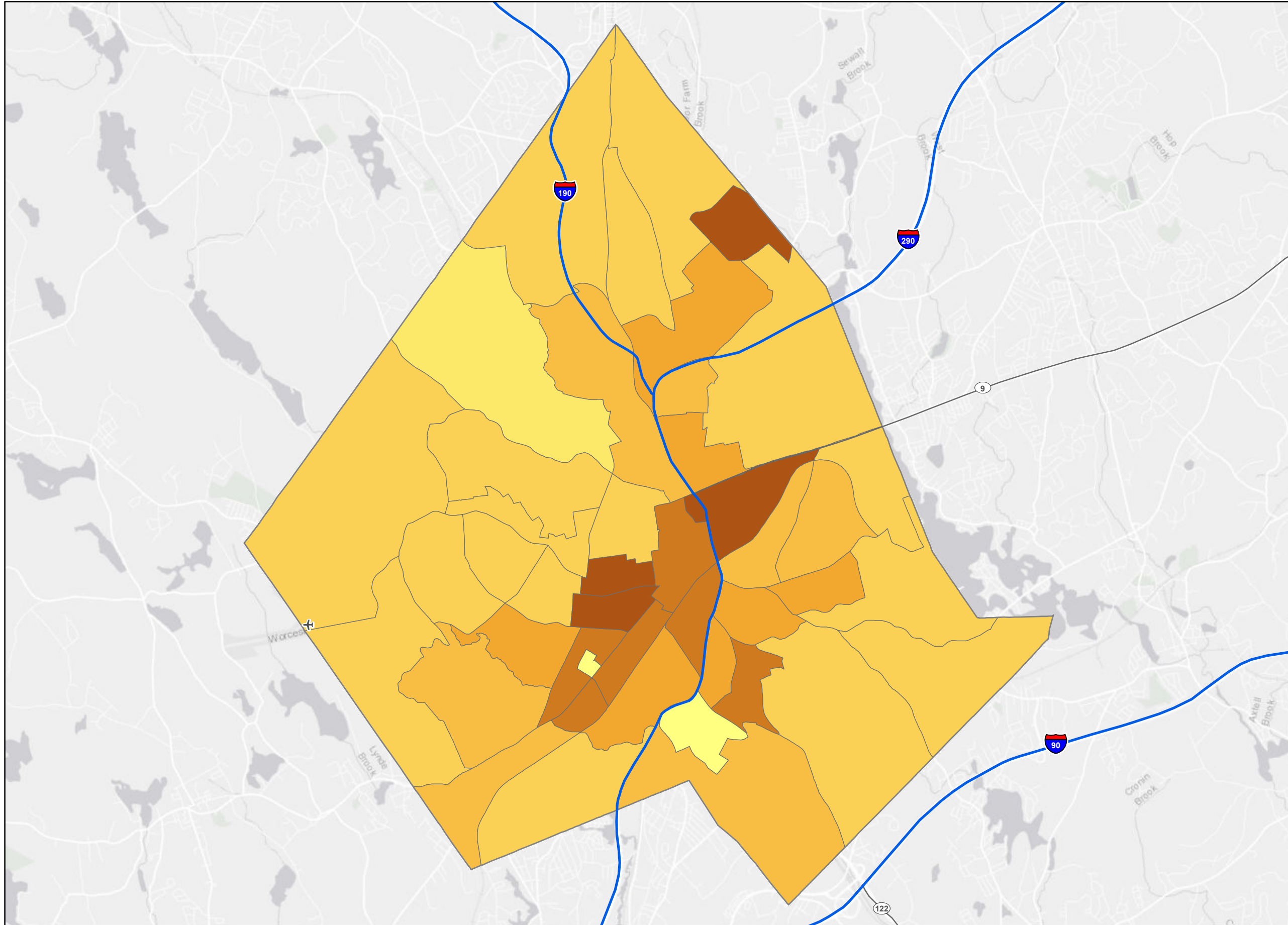
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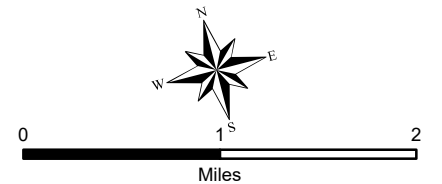


Physical health not good for 14 or more days among adults aged 18 years and older by census tract, Worcester, MA, 2016



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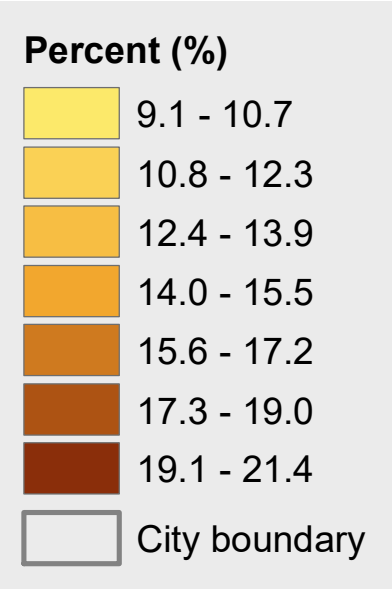
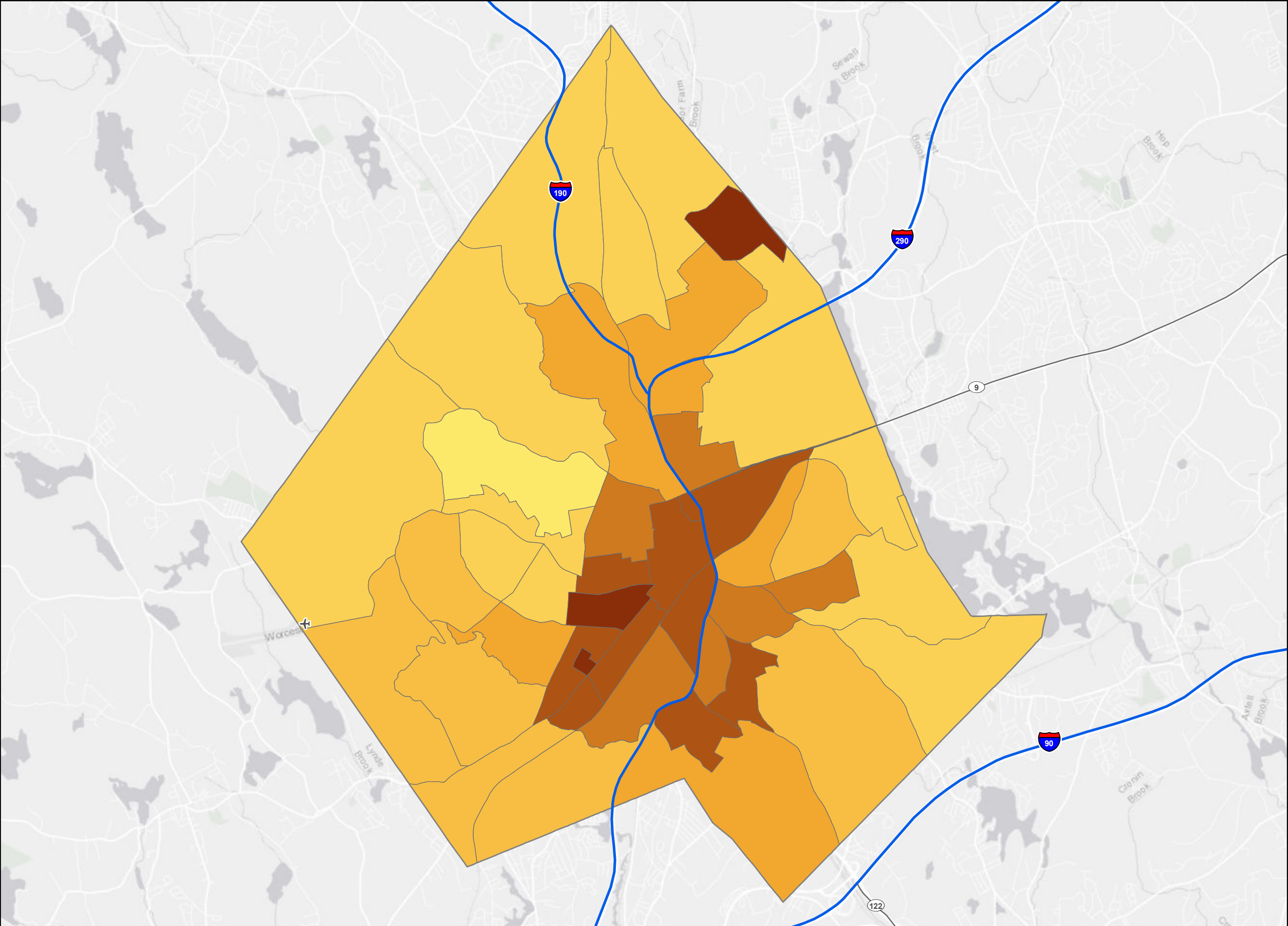
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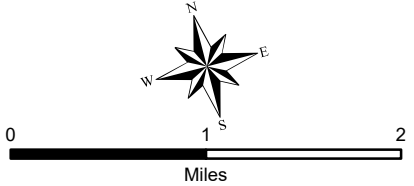


Mental health not good for ≥ 14 days among adults aged ≥ 18 years by census tract, Worcester, MA, 2016



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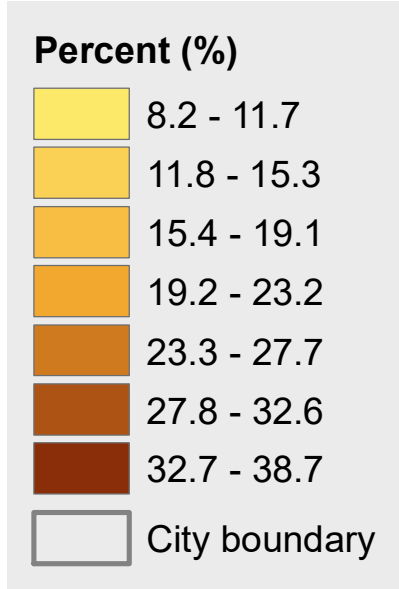
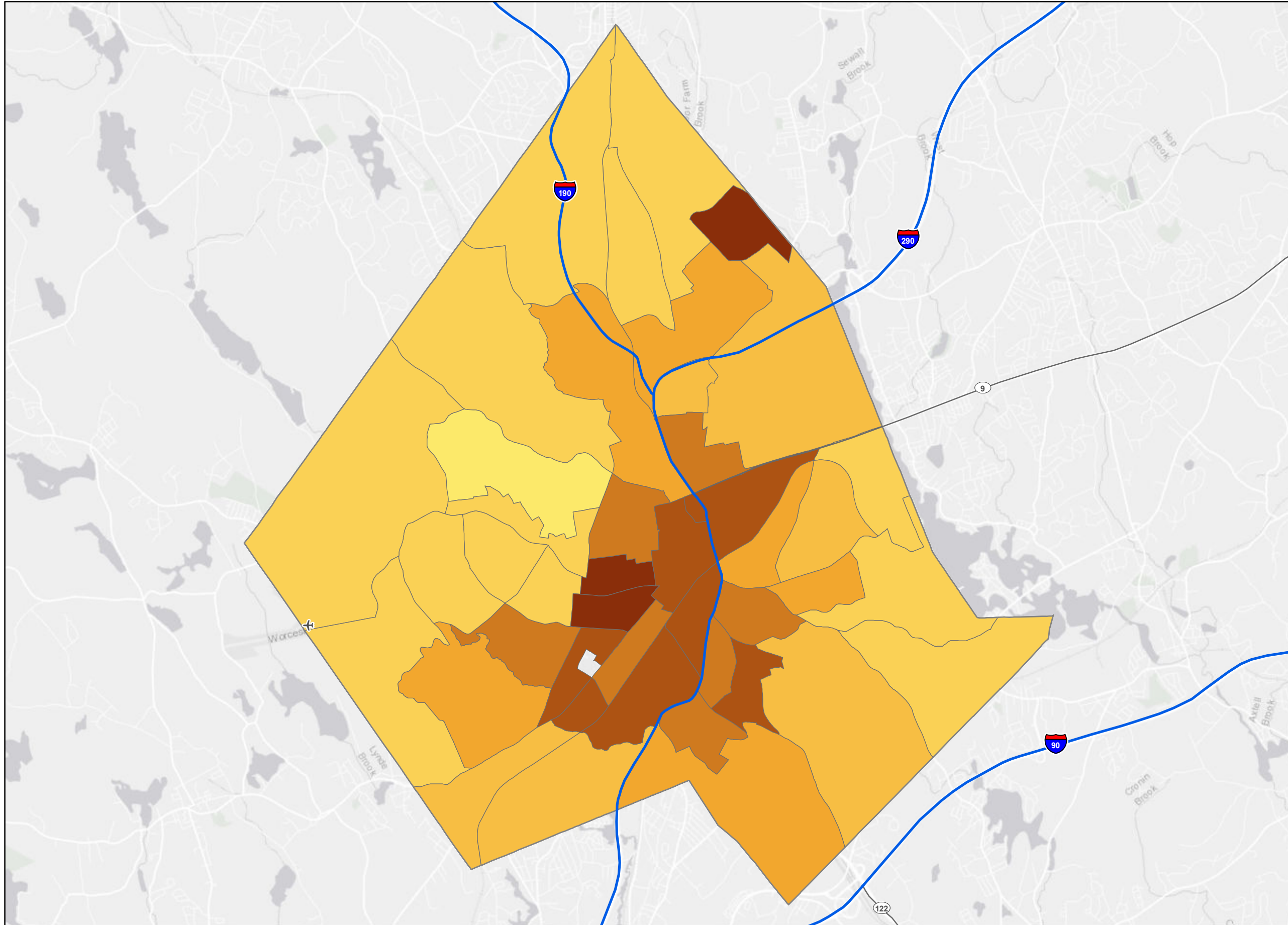
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Data sources:
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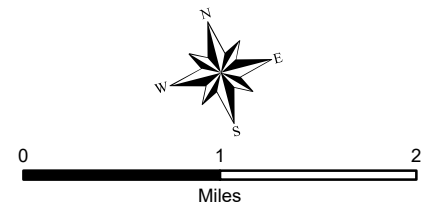


All teeth lost among adults aged ≥ 65 years by census tract, Worcester, MA, 2016



Classification:
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Census tracts with population less than 50 were excluded from the map.

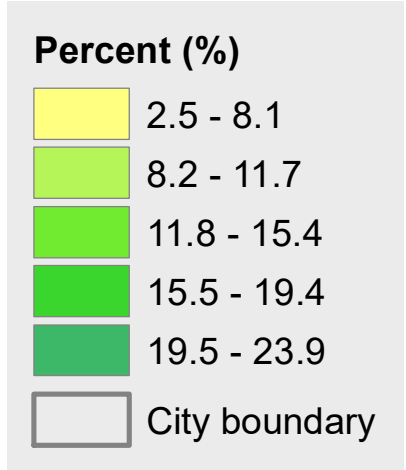
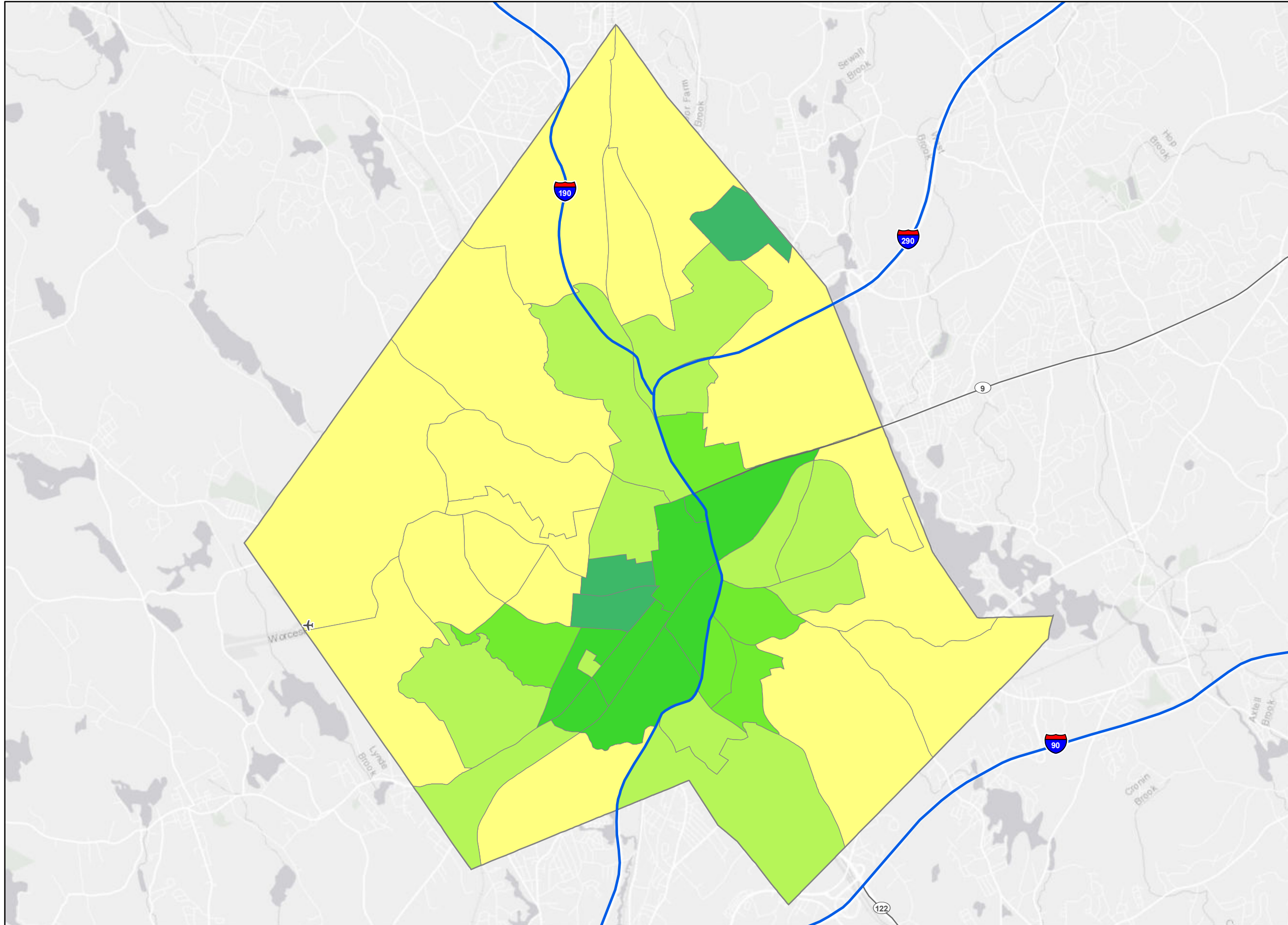


Data sources:
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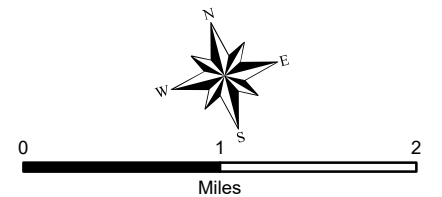
Use of Preventive Services

Current lack of health insurance among adults aged 18-64 years by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

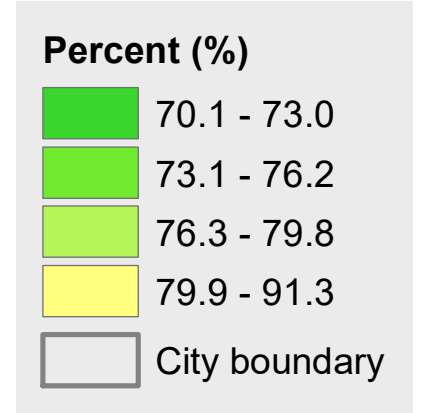
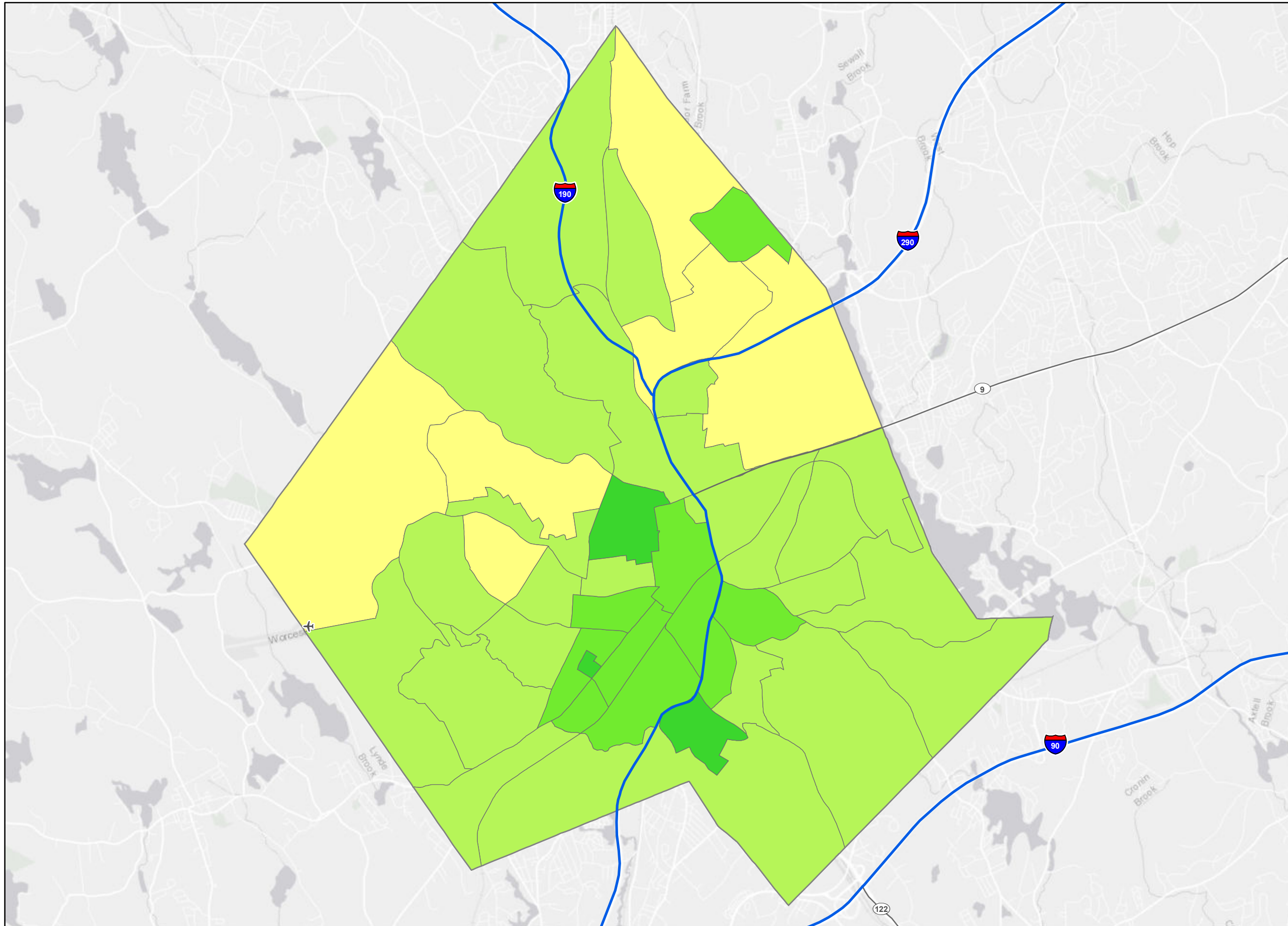
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

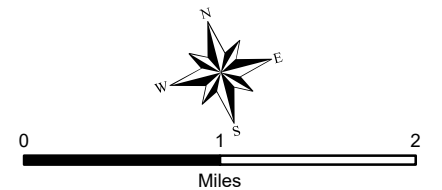


Visits to doctor for routine checkup within the past year among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

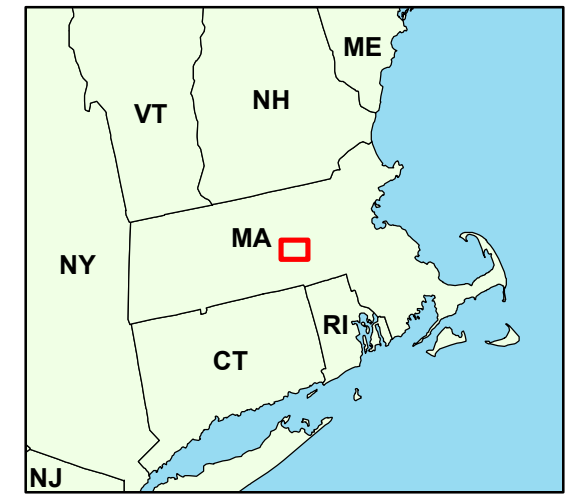


Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

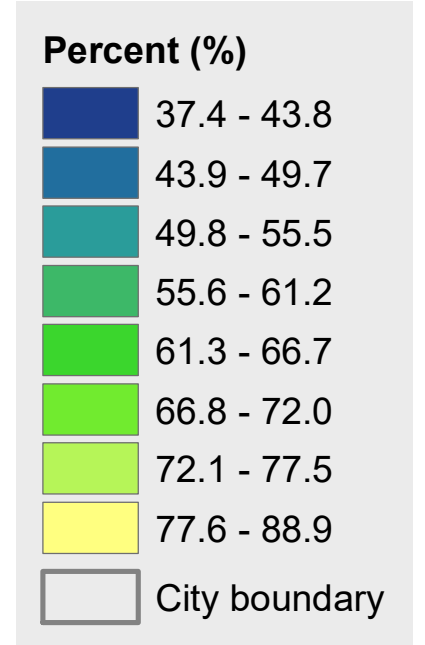
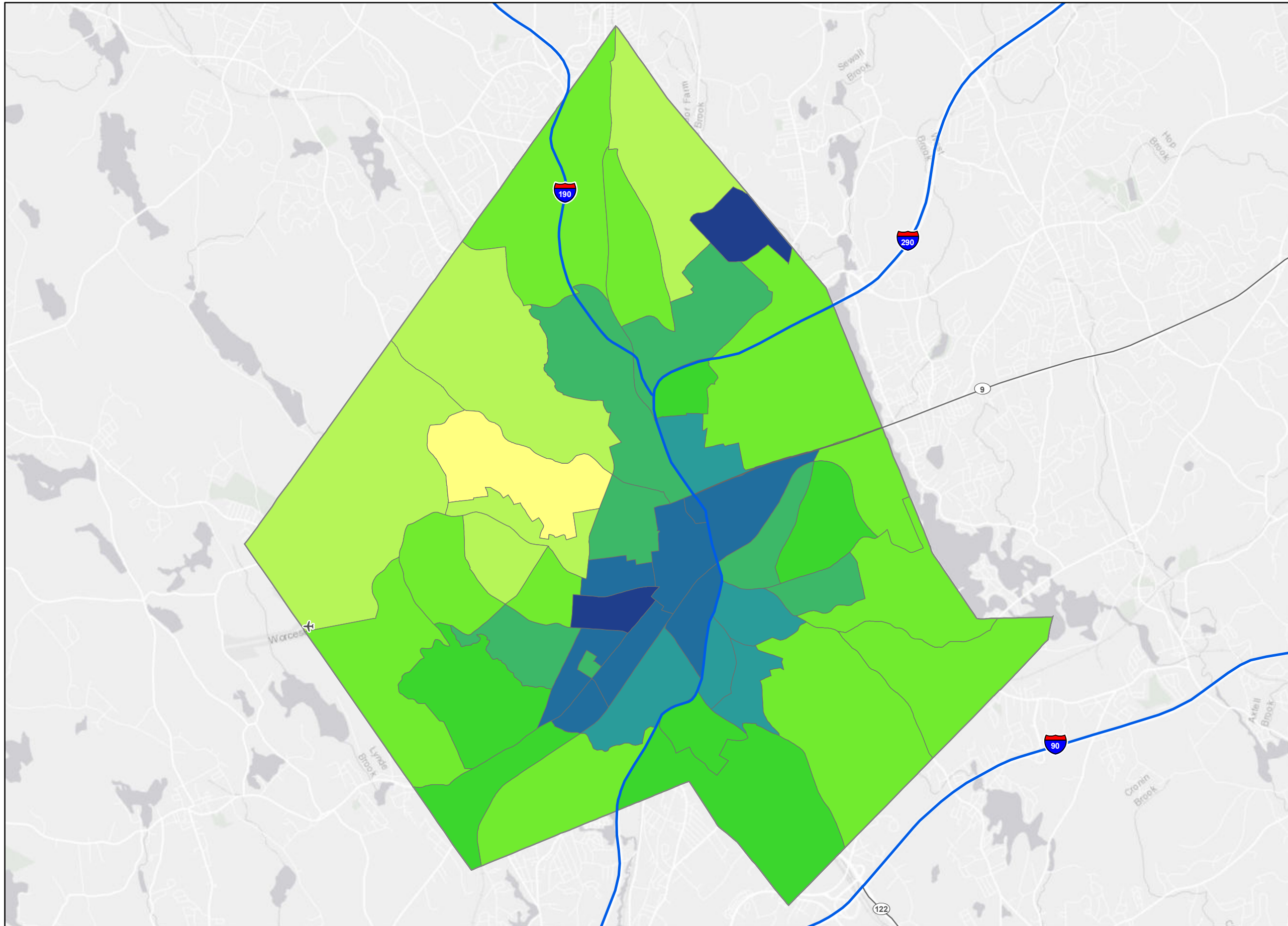
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

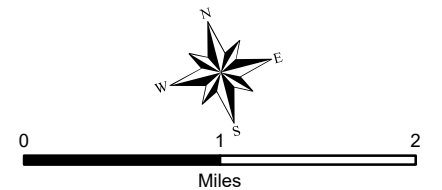


Visits to dentist or dental clinic among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

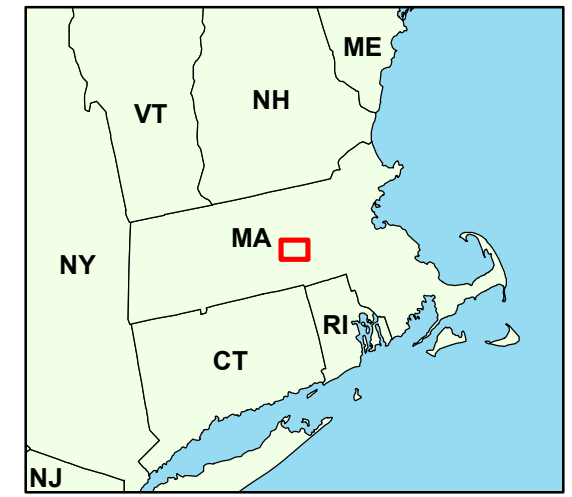


Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

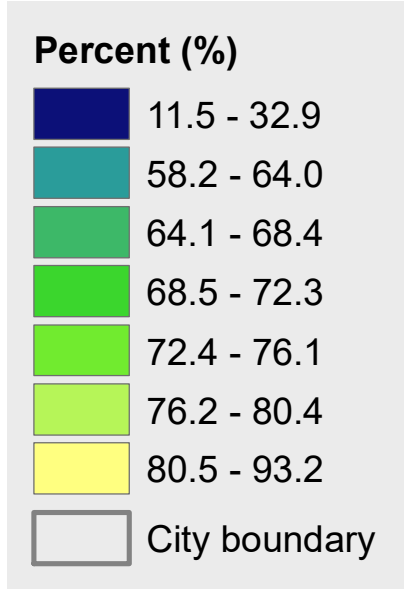
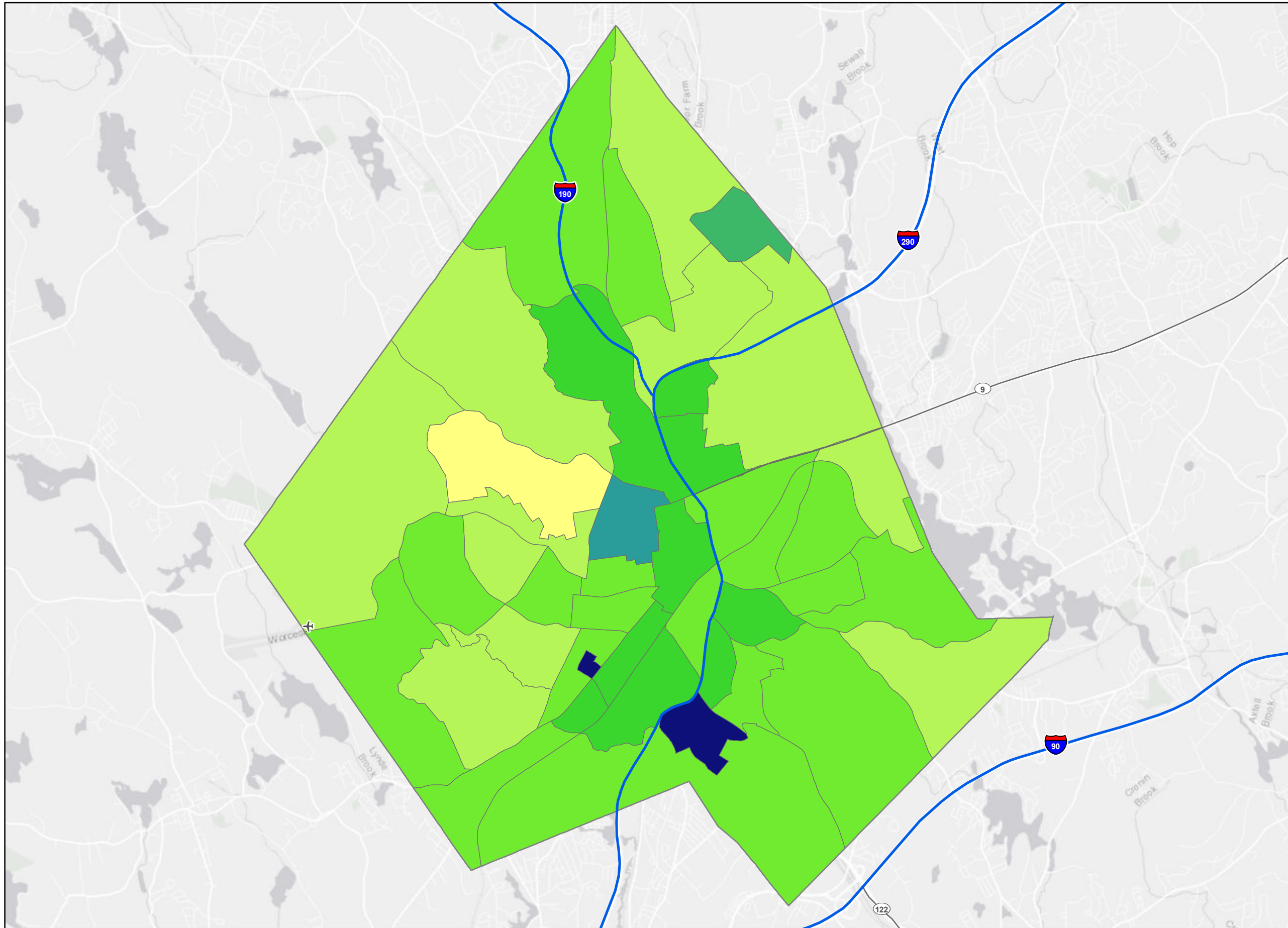
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

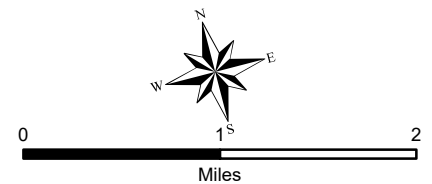


Taking medicine for high blood pressure control among adults aged ≥ 18 years with high blood pressure by census tract, Worcester, MA, 2015



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

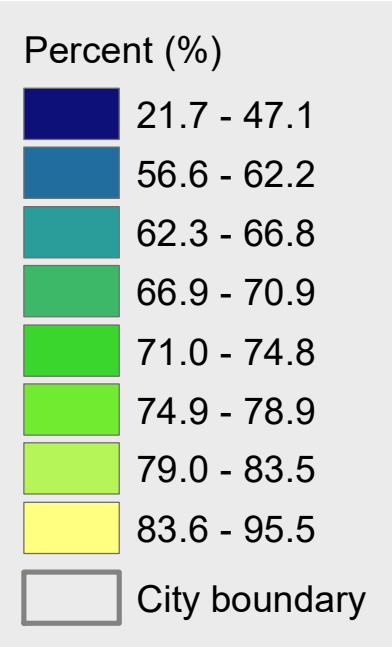
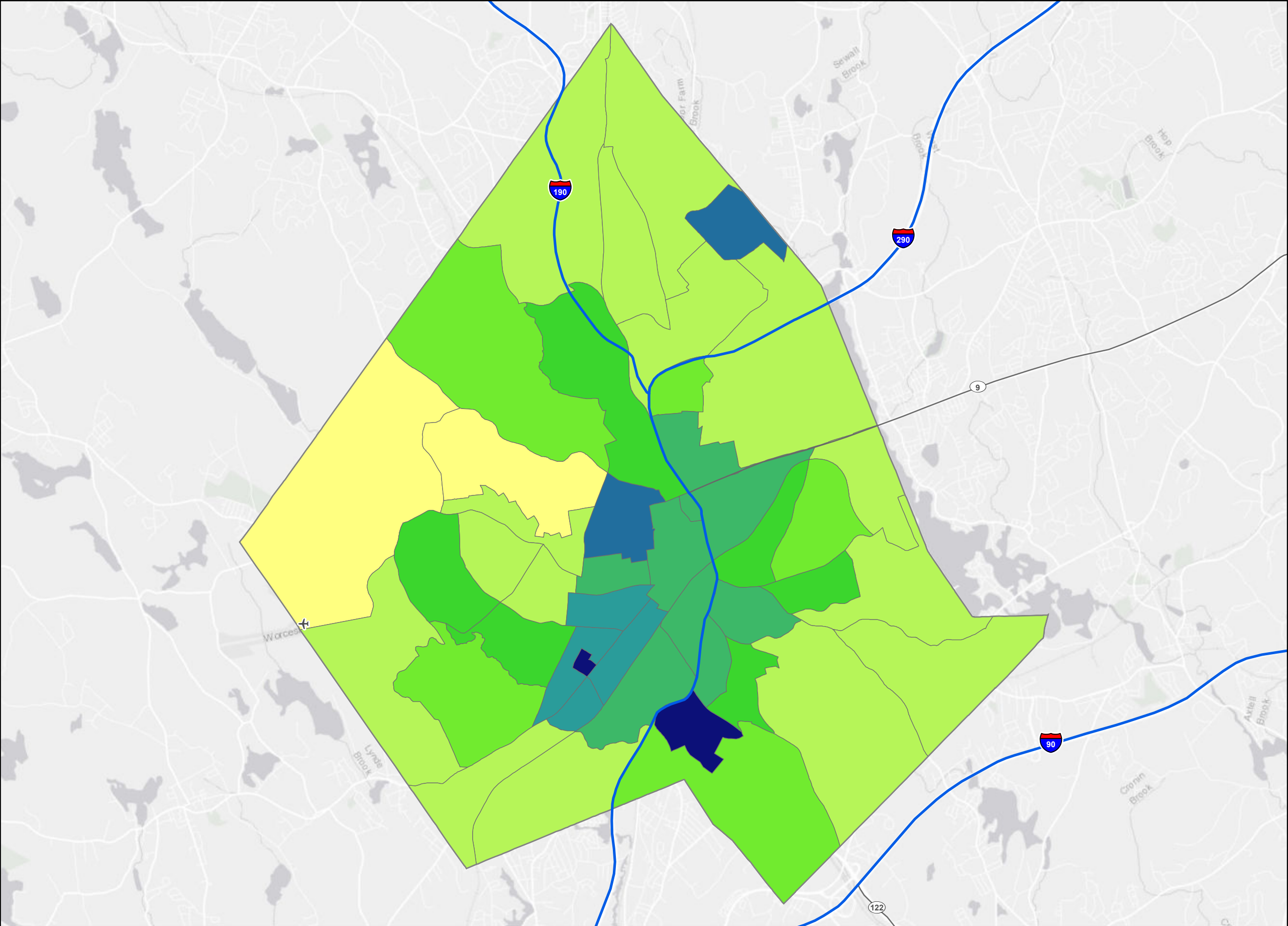
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2015, US Census Bureau 2010 Census, ACS 2011-2015

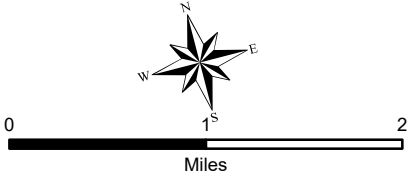


Cholesterol screening among adults aged ≥ 18 years by census tract, Worcester, MA, 2015



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

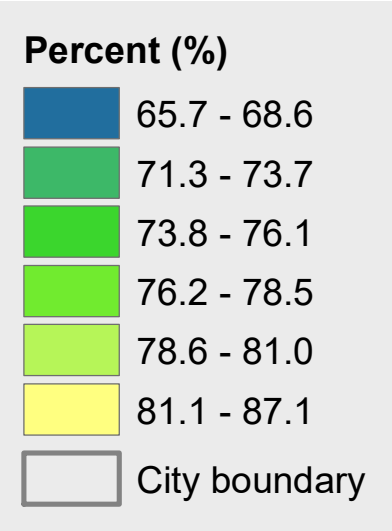
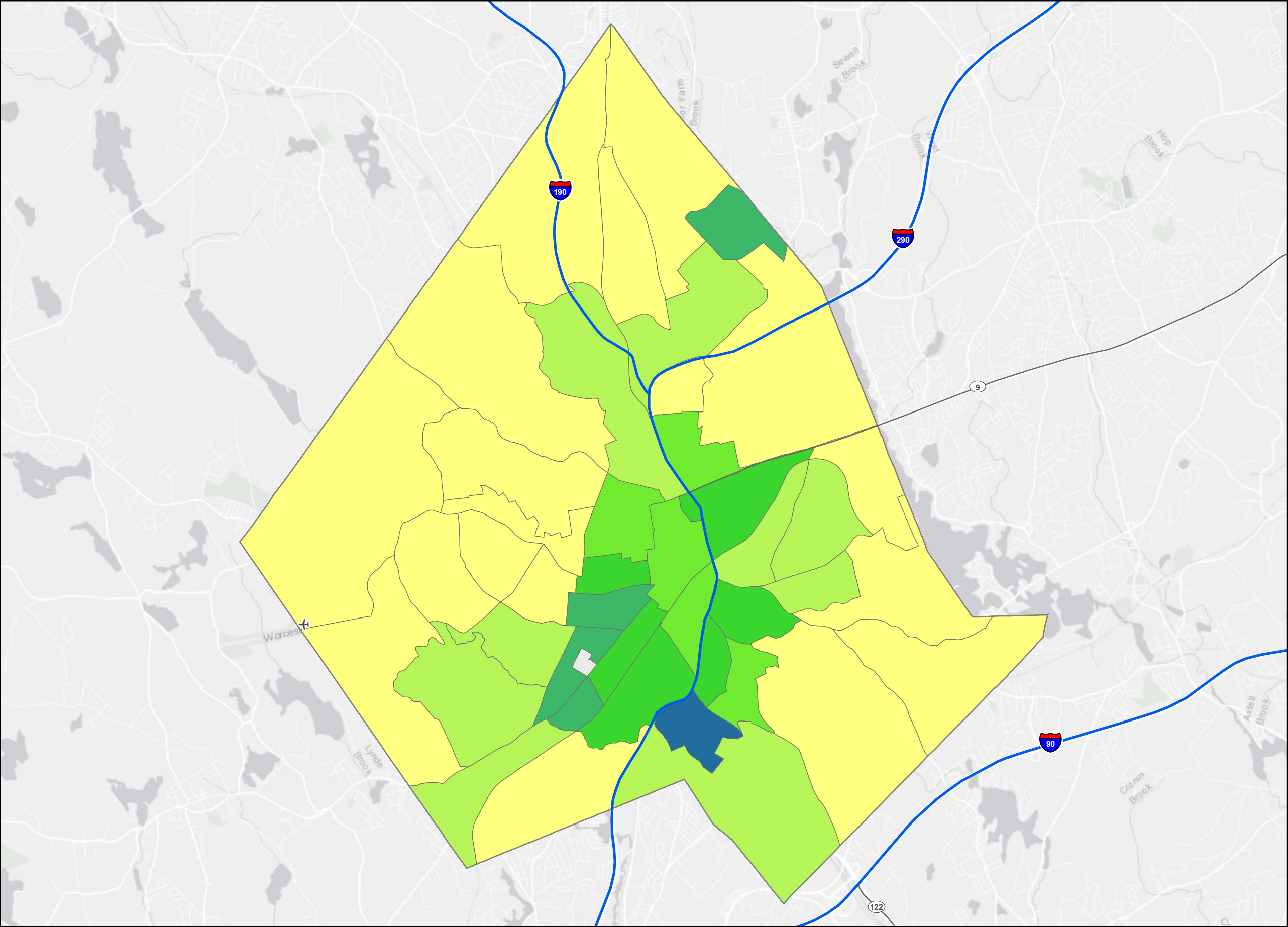
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2015, US Census Bureau 2010 Census, ACS 2011-2015

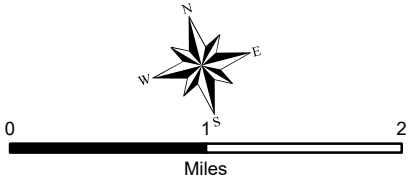


Mammography use among women aged 50-74 years by census tract, Worcester, MA, 2016

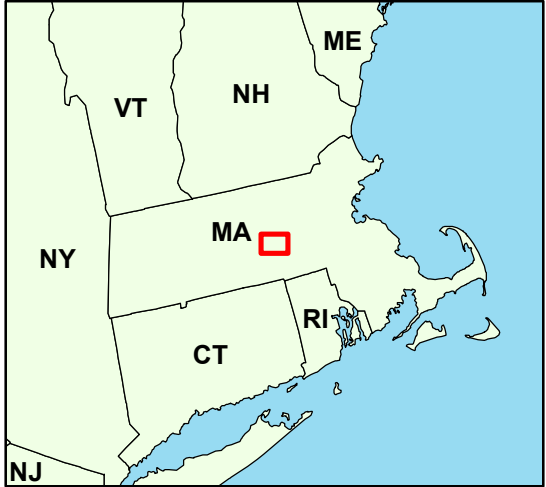


Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

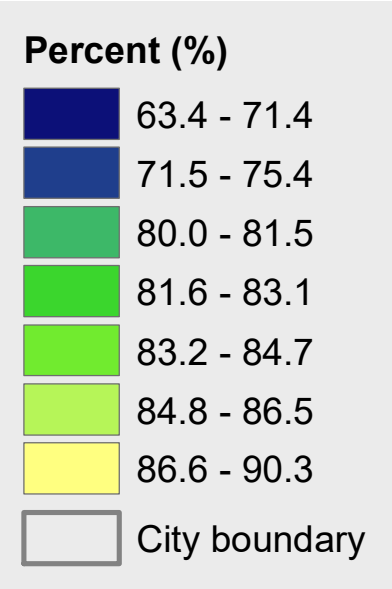
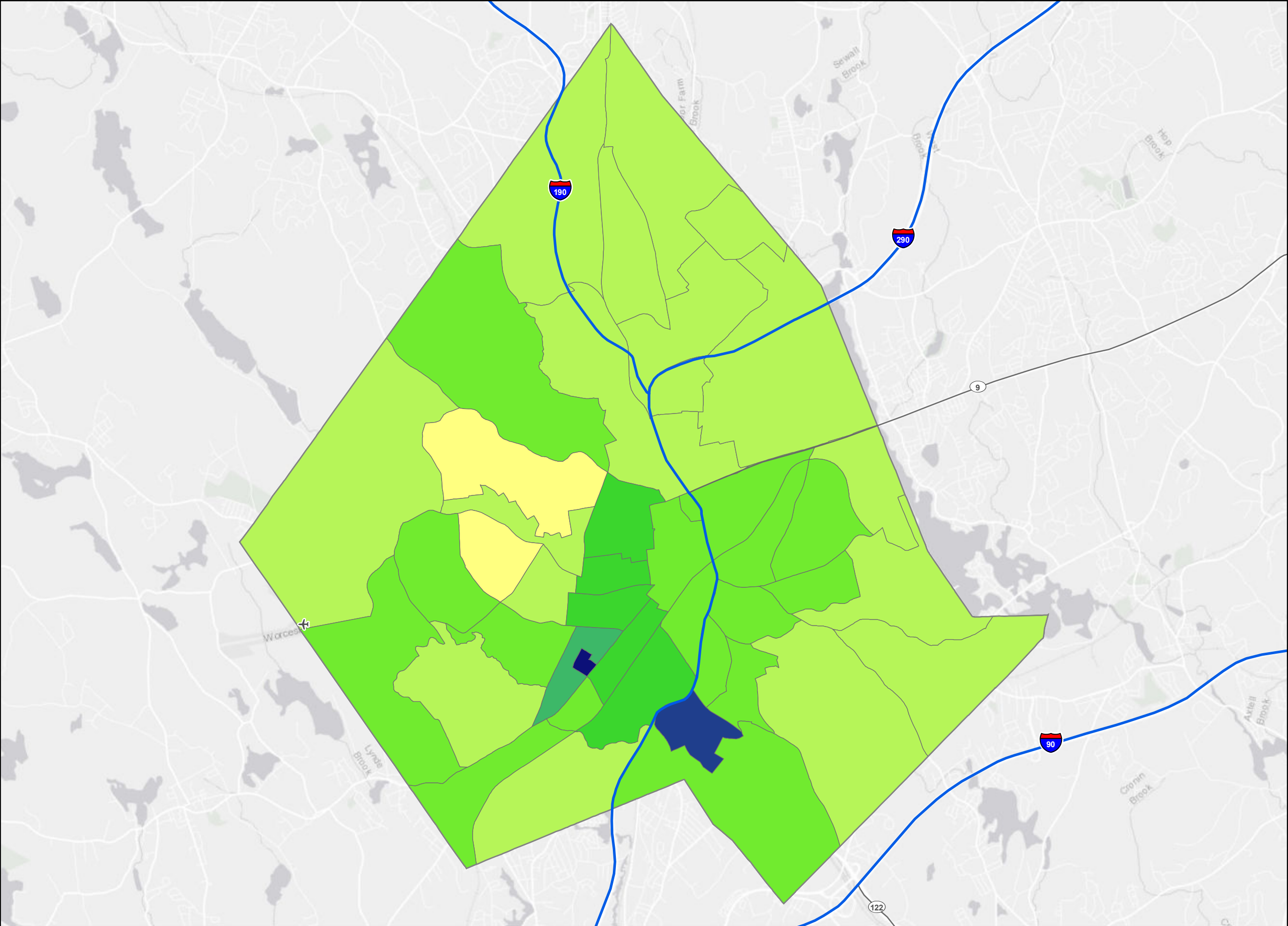
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016.

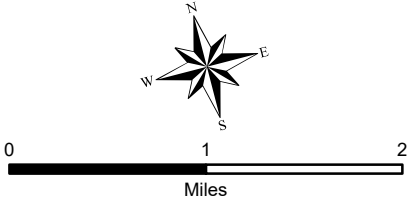


Papanicolaou smear use among adult women aged 21-65 years by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

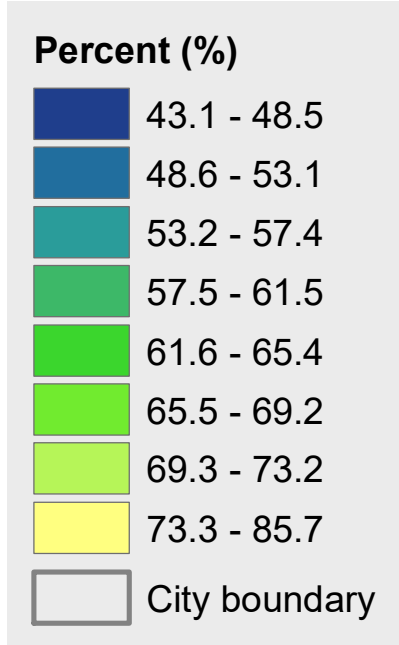
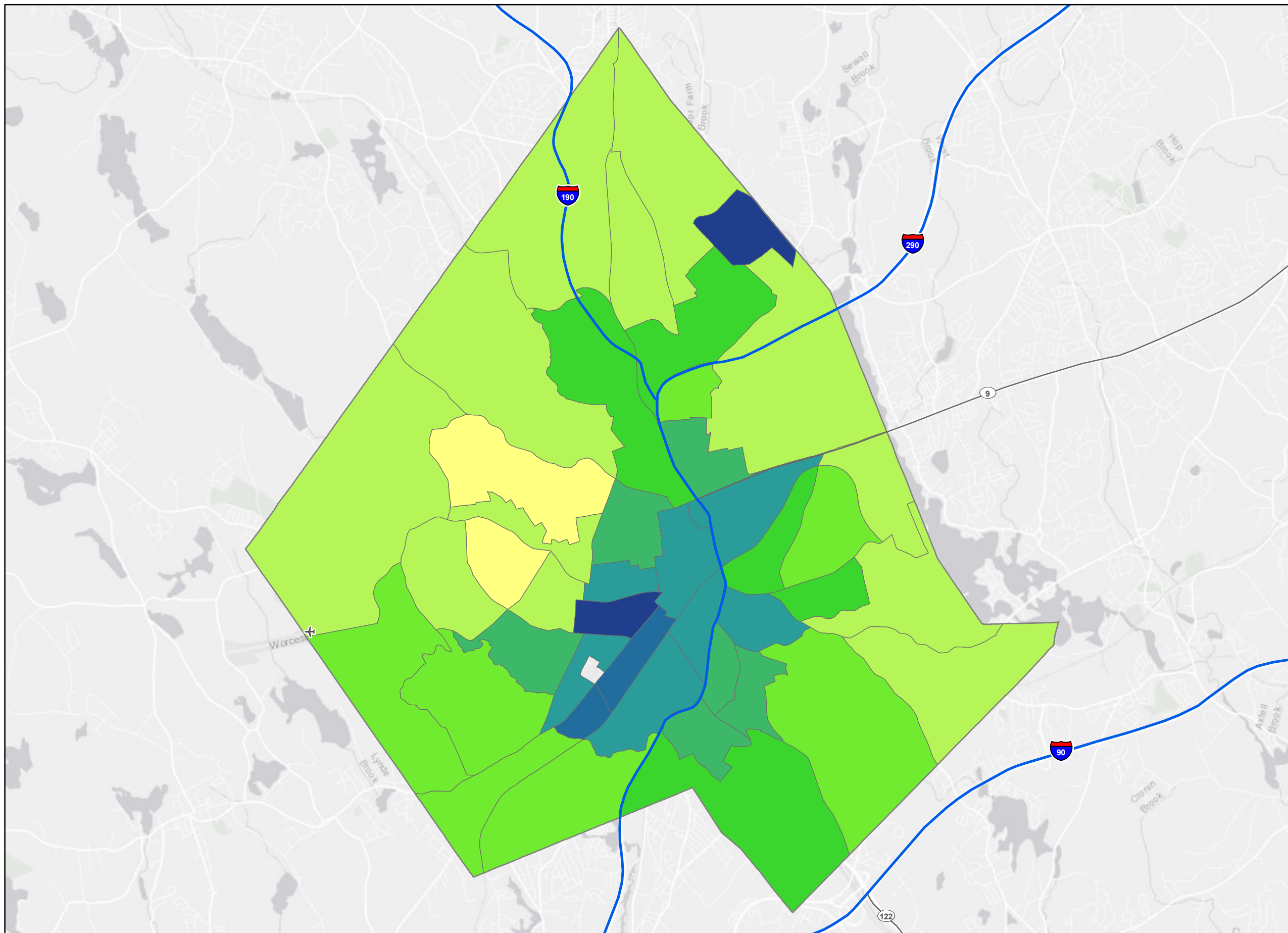
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

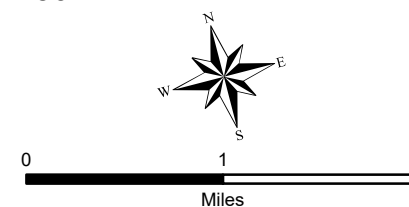


Fecal occult blood test, sigmoidoscopy, or colonoscopy among adults aged 50-75 years by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

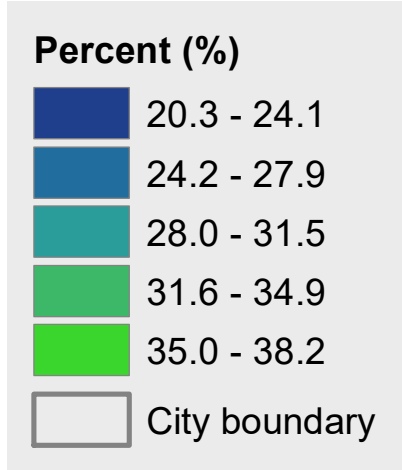
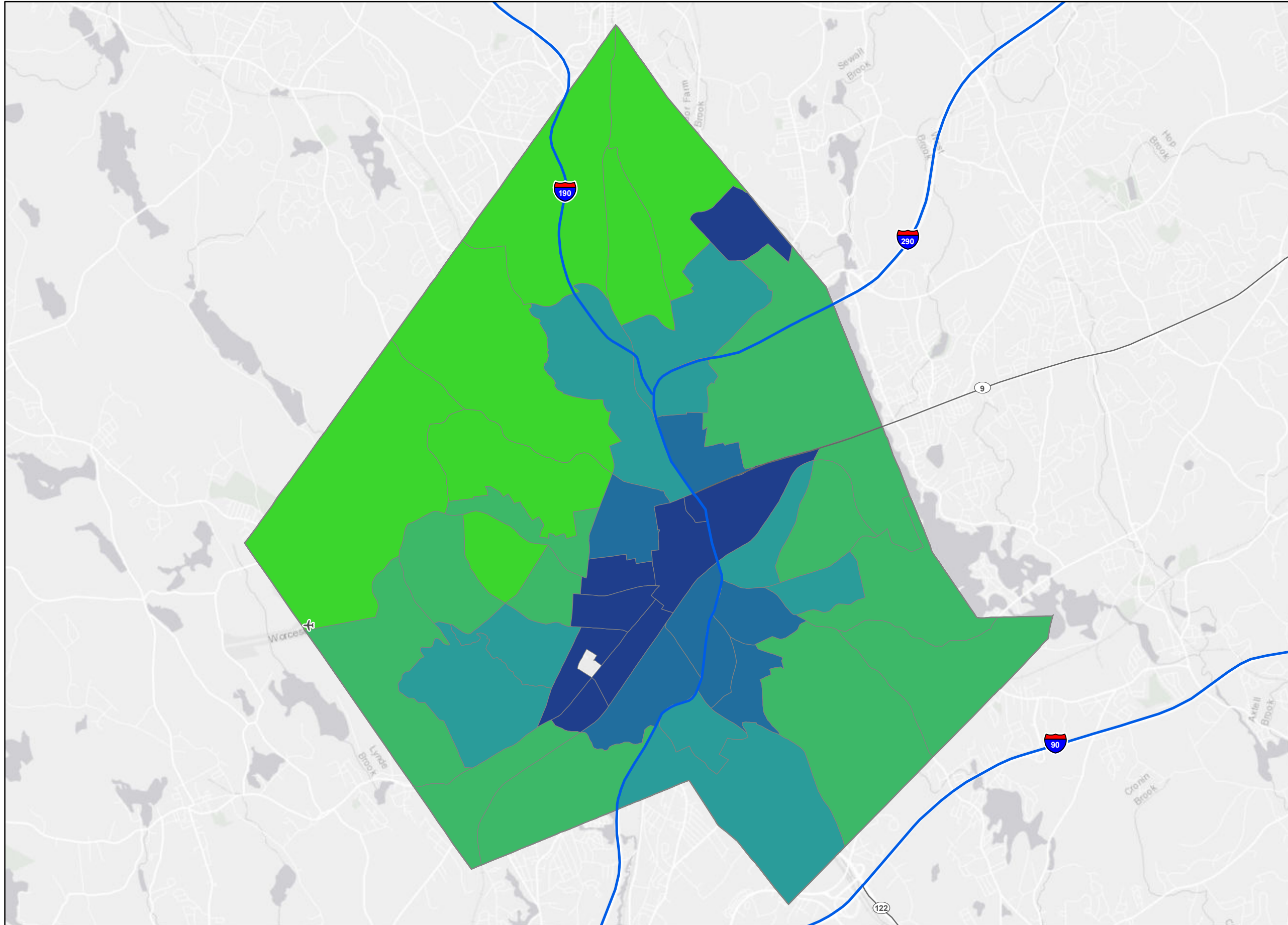
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

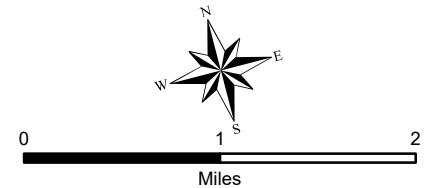


Older adults men aged ≥ 65 years who are up to date on a core set of clinical preventive services by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

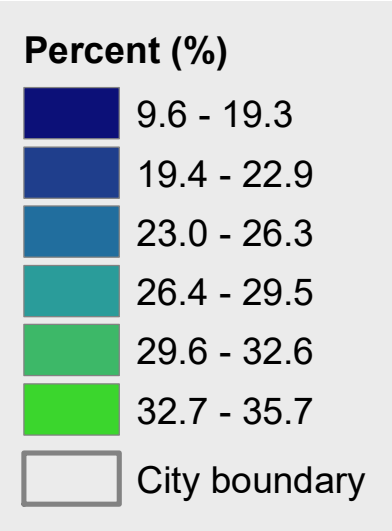
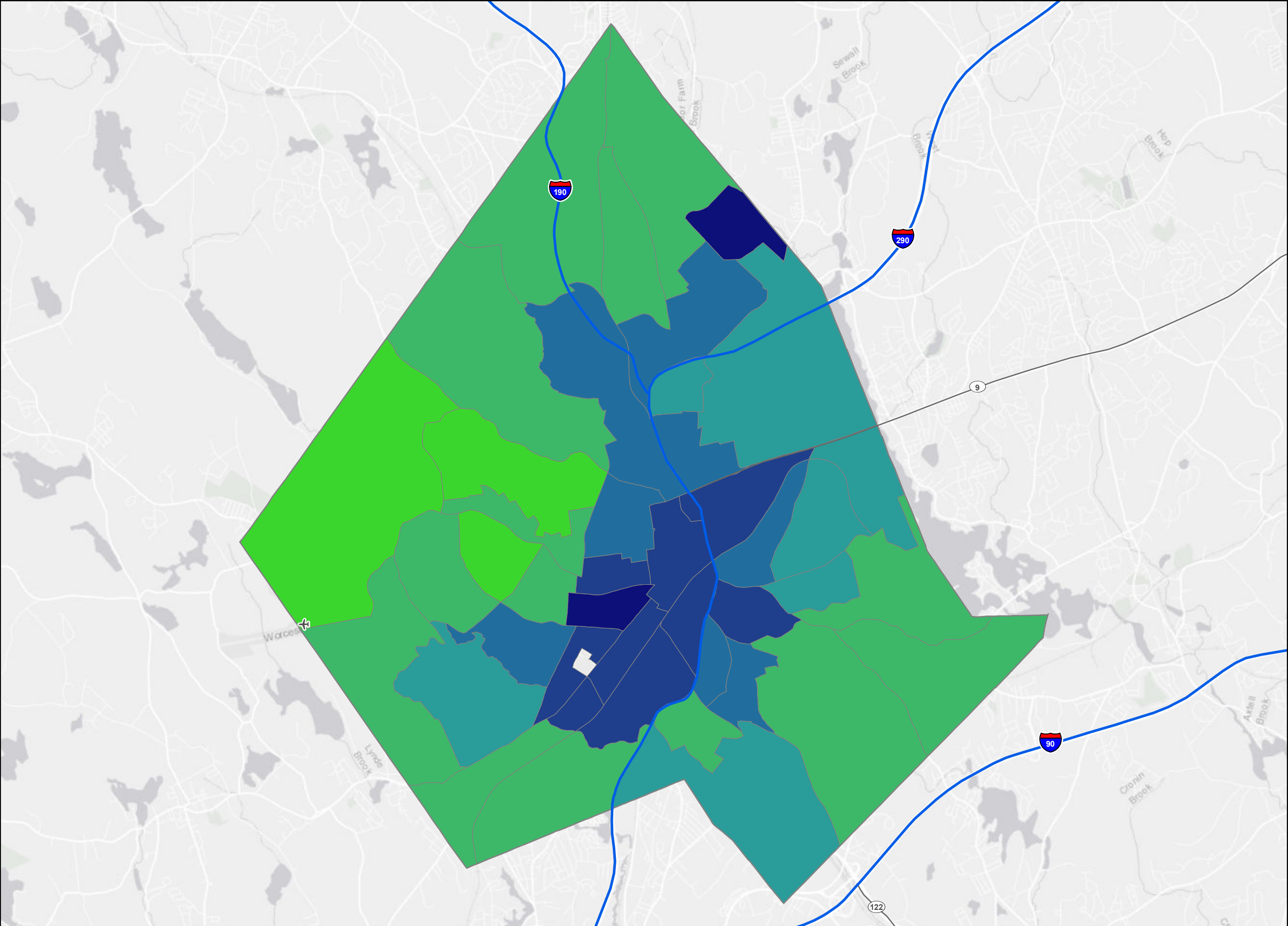
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

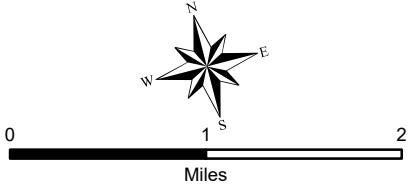


Older adults women aged ≥ 65 years who are up to date on a core set of clinical preventive services by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.

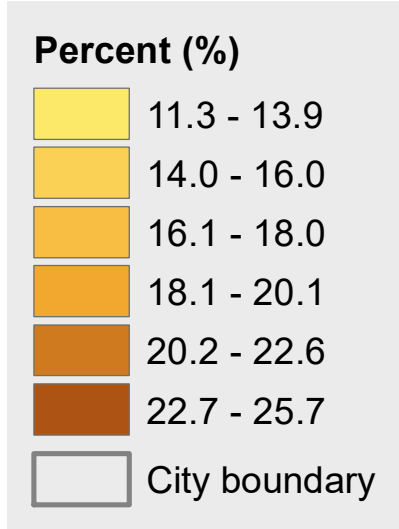
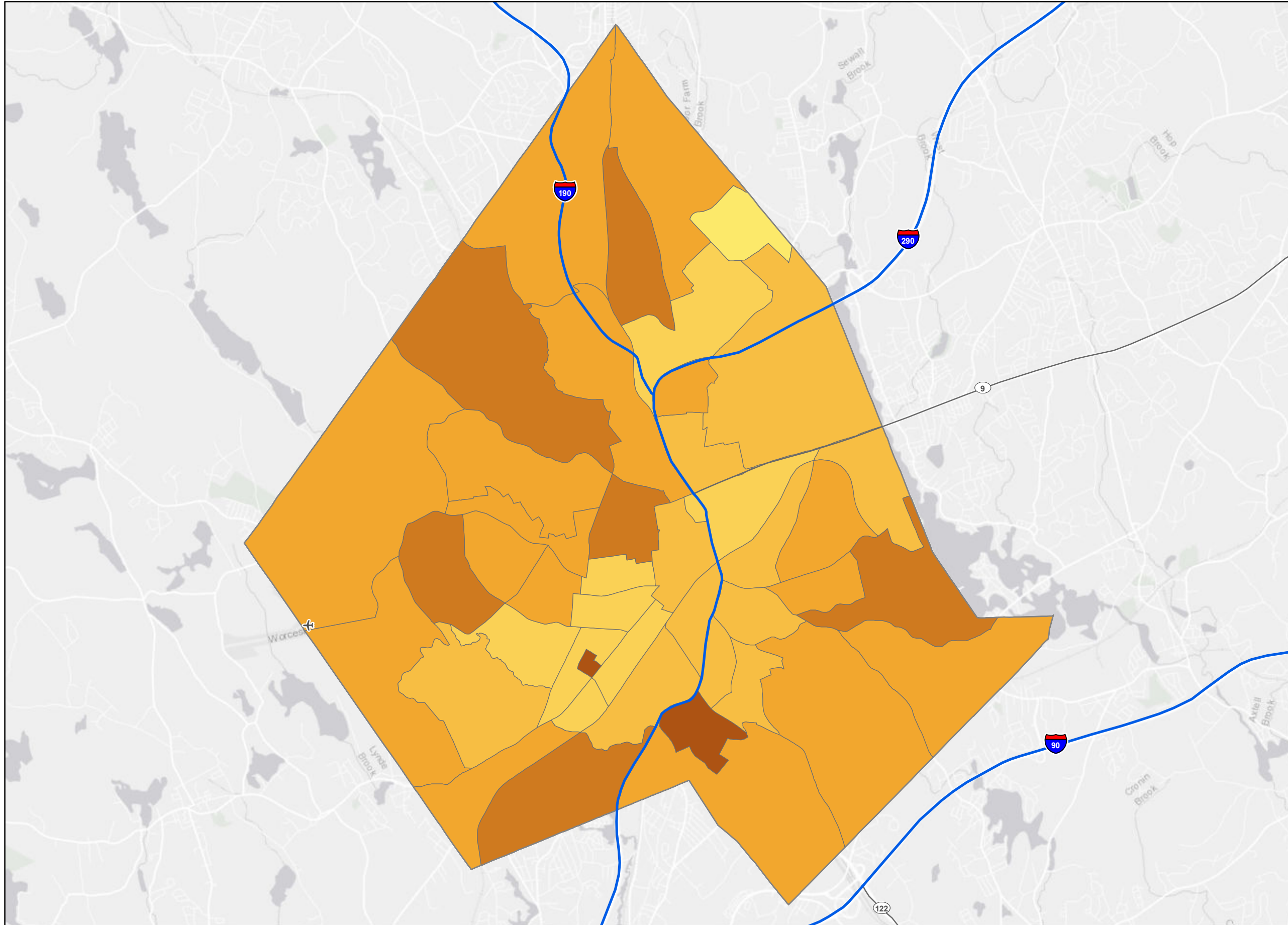


Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016



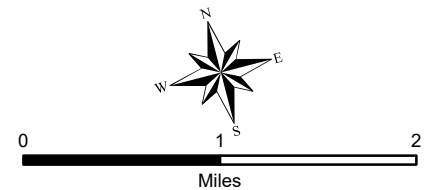
Unhealthy Behaviors

Binge drinking prevalence among adults aged ≥ 18 years by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

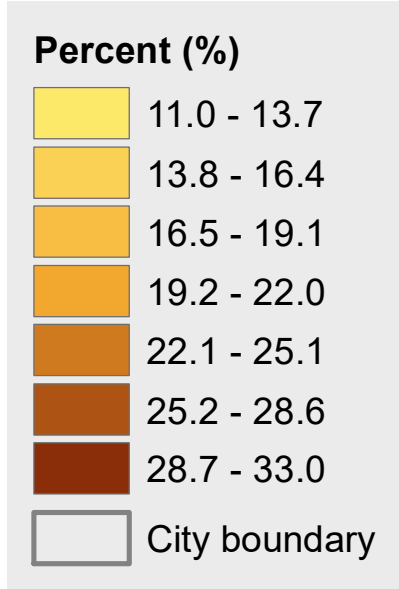
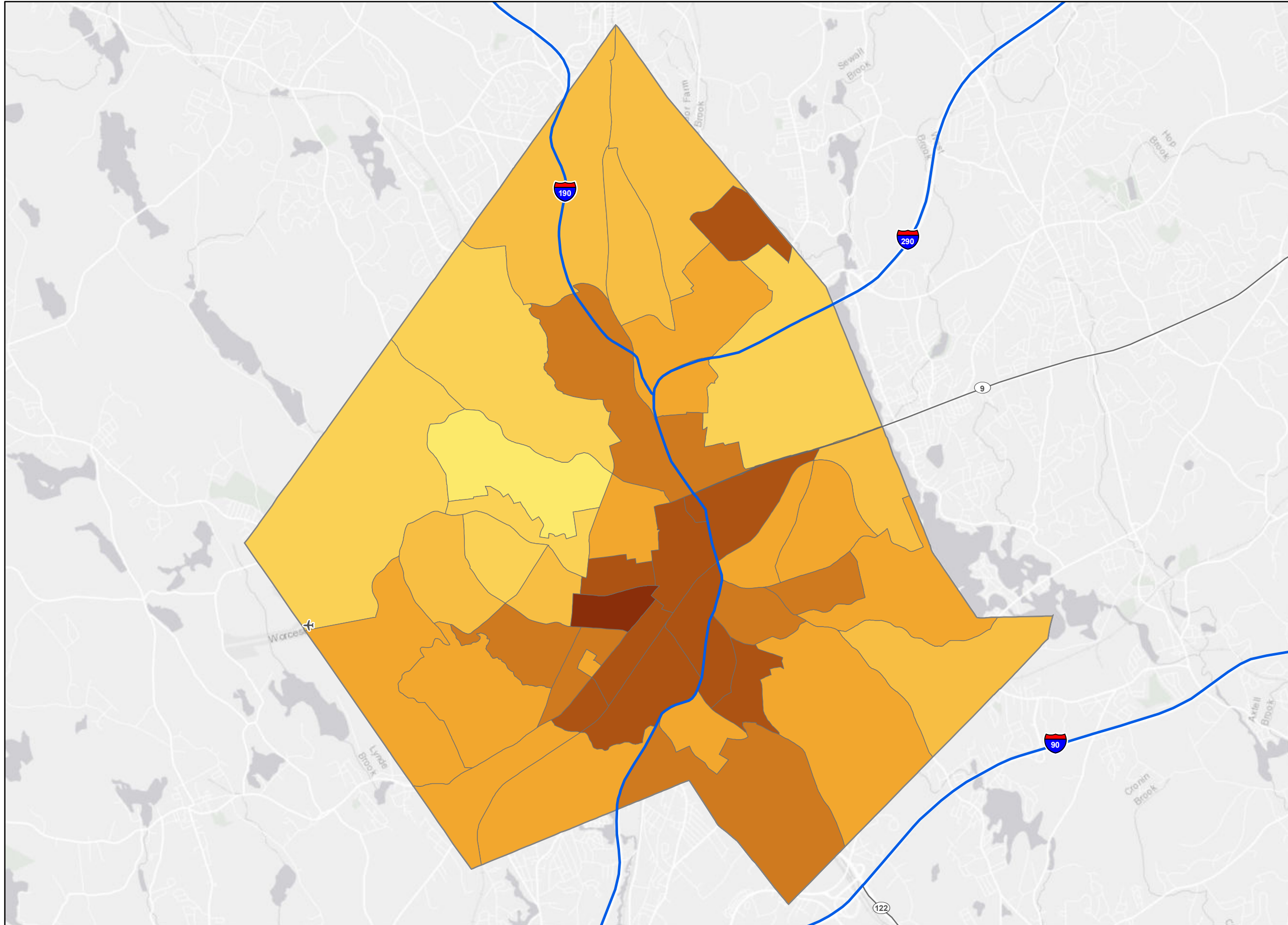
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

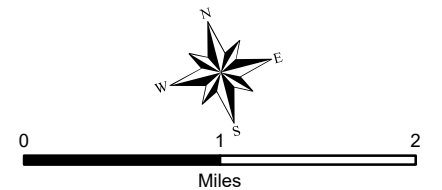


Current smoking among adults aged ≥ 18 years by census tract, Worcester, MA, 2016

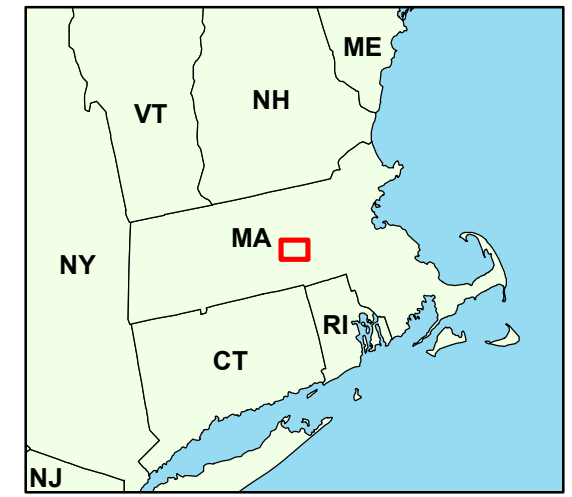


Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

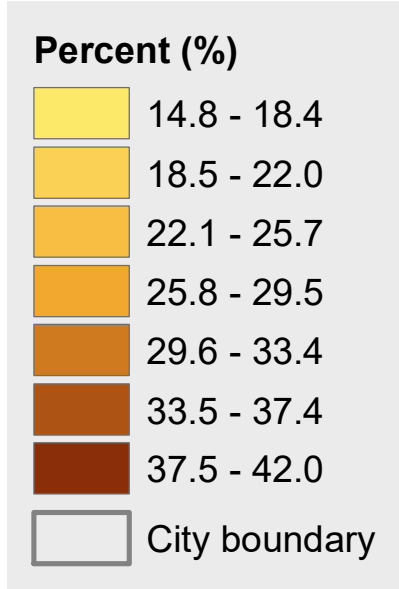
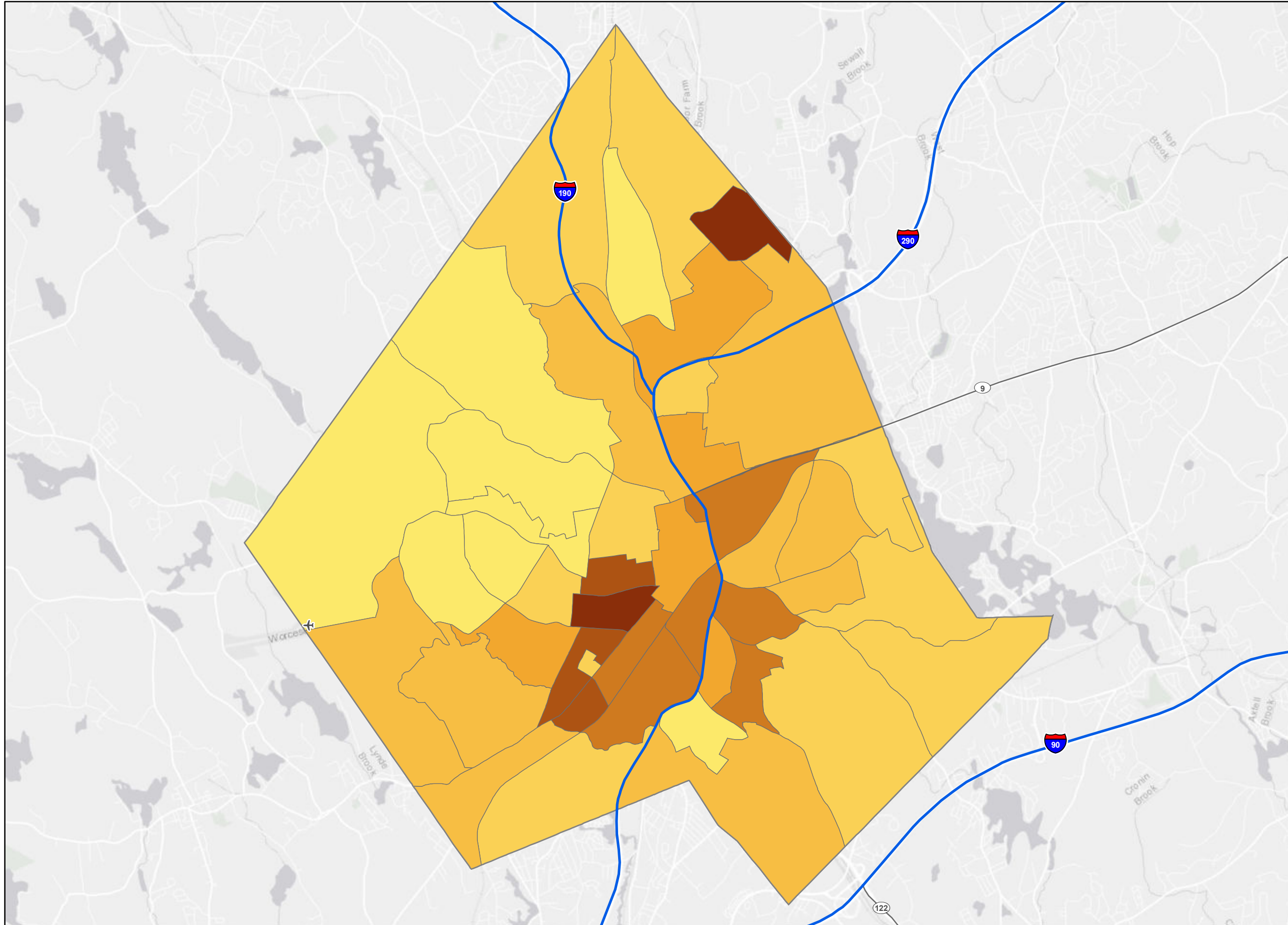
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

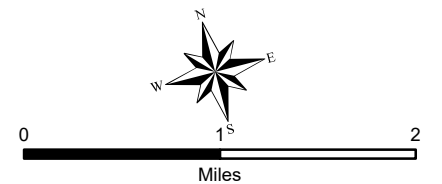


No leisure-time physical activity among adults aged ≥ 18 years by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

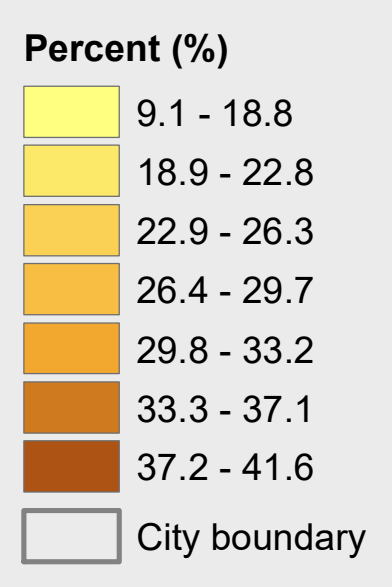
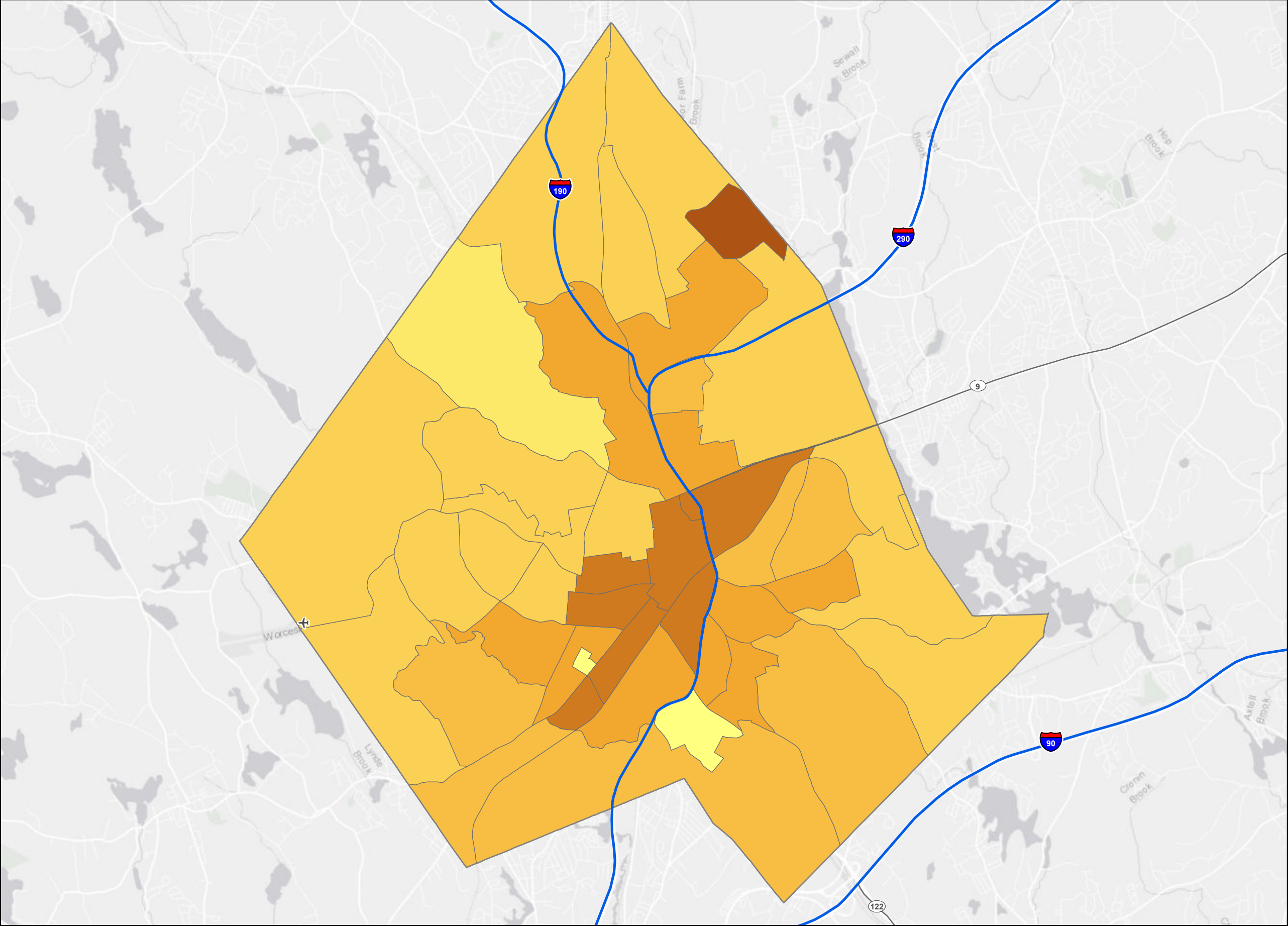
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016.

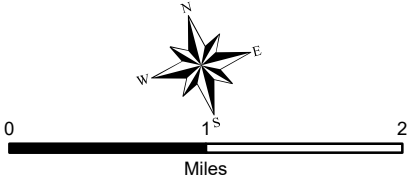


Obesity among adults aged 18 years and older by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

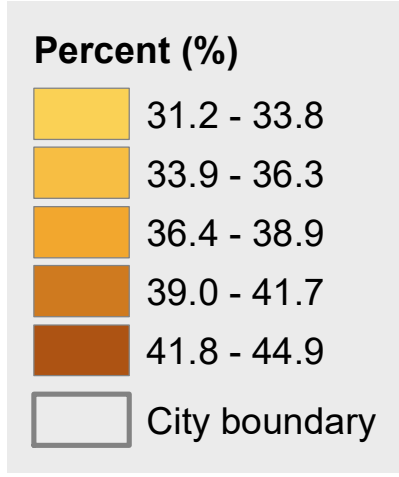
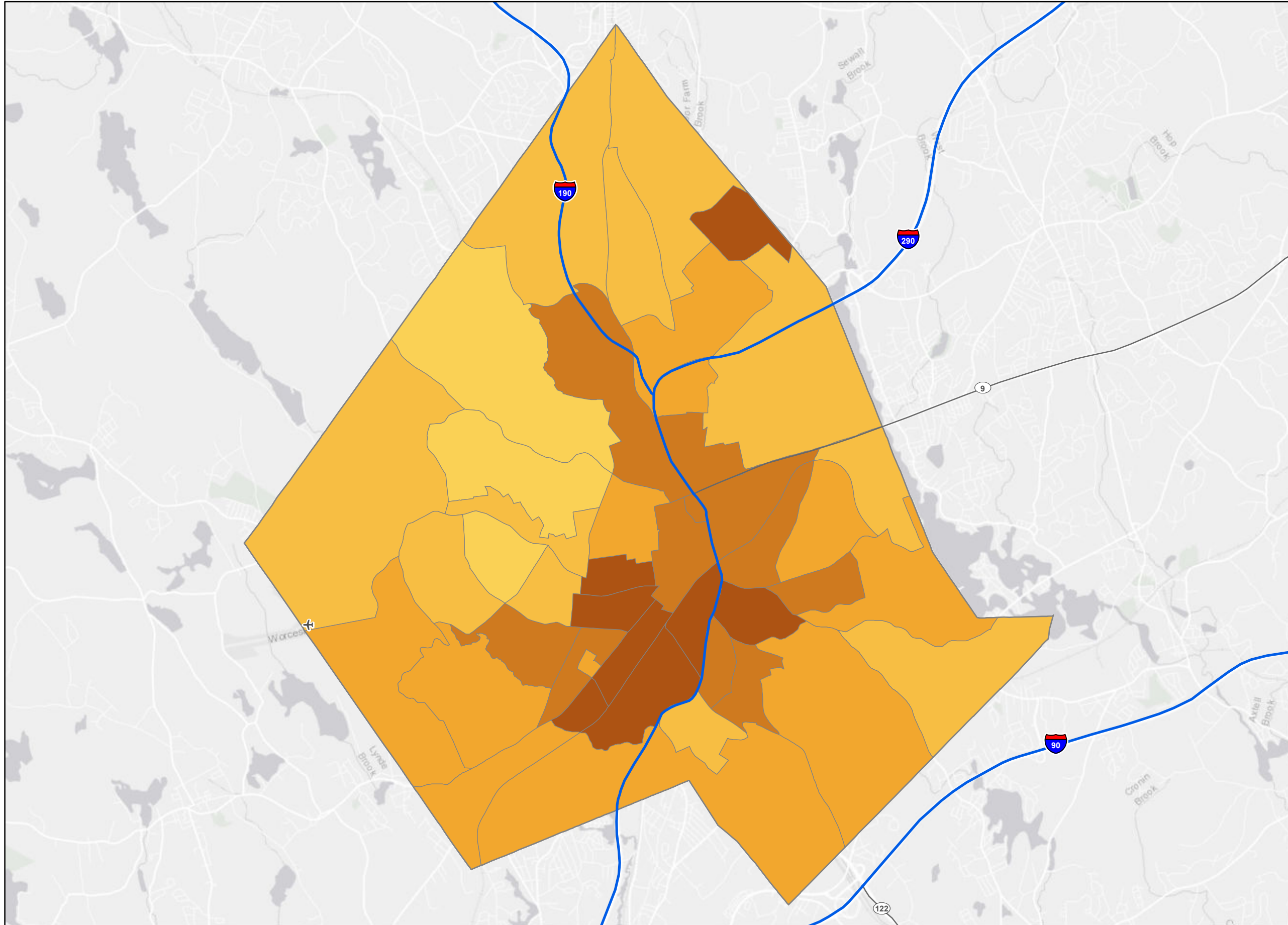
Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

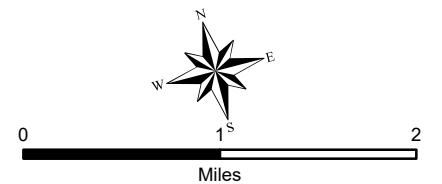


Sleeping less than 7 hours among adults aged 18 years and older by census tract, Worcester, MA, 2016



Classification:
 Jenks natural breaks (9 classes) based on data for all 500 cities' census tracts. Legend depicts only those data classes within this map extent.

Census tracts with population less than 50 were excluded from the map.



Data sources:
 CDC BRFSS 2016, US Census Bureau 2010 Census, ACS 2012-2016

