Diabetes Risk Factors Community Profile Northwest Michigan 12 Counties

December 2013

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The National Association of Chronic Disease Directors (NACDD) has contracted with the Directors of Health Promotion and Education (DHPE) to provide the following data and recommendations to identify:

- target audiences for the Diabetes Prevention Programs (DPP)
- how to reach the target audience
- health care facilities in the area that can refer to DPPs.
- locations of select business that may be useful in promoting DPPs

This report uses PRIZM segment descriptions to determine where people at risk for diabetes may be located. Each segment has unique demographic descriptions based on income, life stage, age range, presence of children in the household, home ownership, employment, education and race and ethnicity; there are 66 PRIZM segments. Based on the segment profiles the following questions can be examined:

- Where is the target population located?
- How would you reach them?
- What else is in the area?

Target Population

Approximately 87,200[1] prediabetic adults 21 years old and older live in the twelve northwest counties in Michigan's Lower Peninsula. The twelve counties in the northwest include the following: Charlevoix, Antrim, Otsego, Leelanau, Benzie, Grand Traverse, Kalkaska, Crawford, Manistee, Wexford, Missaukee and Roscommon. Below is a table with the number of prediabetic adults in each of the twelve counties in northwest of Michigan.

County	Approximate Number of prediabetic adults
Charlevoix	3,775
Antrim	6,170
Otsego	6,200
Leelanau	5,795
Benzie	4,626
Grand Traverse	23,486
Kalkaska	4,460
Crawford	3,775
Manistee	6,758
Missaukee	3,830
Wexford	8,260
Roscommon	6,977

Approximately 50% of adults 65 and older are estimated to have prediabetes.[1] People with prediabetes have an increased risk of developing type 2 diabetes, heart disease, and stroke. Studies have shown that people with prediabetes who lose weight and increase their physical activity can prevent or delay type 2 diabetes and, in some cases, return their blood glucose levels to normal.

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[1]Estimate is based on multiplying the population for those 21 years old and older by 35%.The estimated number of persons with prediabetes was calculated by applying the national estimate of prediabetes from NHANES III to the 2013 population estimate for adults aged 21 years and older in the geography of interest. This is the same methodology as was used in the Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Available at: http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf.

If the modifiable risk factors for type 2 diabetes (being overweight or obese and physical inactive) continue to increase, so will the prevalence of type 2 diabetes. The adult obesity prevalence in Michigan increased from 18.2 to 31.7 percent between 1995 and 2010.[2]

Individuals at greatest risk of developing diabetes in Michigan are:
- African Americans
- Individuals with no college education
- Households that earn less than $25,000 per year

Table 1 provides a summary of some of the demographic factors associated with a higher risk of developing diabetes. **Appendix 2** contains a detailed report of demographics and household characteristics for the areas of interest.

Table 1. Demographics

|	12 Northwest Counties	Michigan	United States
Total Population	329,213	9,862,679	314,861,807
Age			
< 21 years old	24.32%	27.69%	28.08%
21-44	25.15%	29.70%	31.59%
45-64	30.61%	27.87%	26.40%
65-84	17.45%	12.69%	12.06%
85+	2.46%	2.05%	1.87%
Race			
White	95.30%	78.56%	71.49%
Black or African American	0.84%	14.21%	12.71%
American Indian and Alaska Native	1.23%	0.64%	0.96%
Asian	0.47%	2.56%	5.04%
Native Hawaiian and Other Pacific Islander	0.03%	0.03%	0.18%
Some Other Race	0.46%	1.57%	6.56%
Two or More Races	1.66%	2.43%	3.06%
Ethnicity			
Hispanic	1.99%	4.69%	17.33%
Not Hispanic	98.01%	95.31%	82.67%
Household Income			
Average	$55,395	$58,514	$69,637
Median	$41,733	$43,691	$49,297
Population 25 and older with less than a four-year college degree	77.82%	74.90%	71.90%

Compared to the state, the twelve northwest counties have a lower median average household income and higher percent of adults with less than a four-year college degree. This suggests that the population that lives in these counties may be at higher risk of developing diabetes compared to the state as a whole.

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[2] Michigan Behavioral Risk Factor Surveillance System, 1995-2010. Available at http://apps.nccd.cdc.gov/BRFSS.

Map 1 shows the twelve counties in the northwest of Michigan's Lower Peninsula, which is the focus geography for this report.

There are several Federally Qualified Health Centers (FQHC) located in there and three YMCA's.

Map 1 12 County Area in the Northwest of Michigan's Lower Peninsula

FQHC
YMCA
Highway
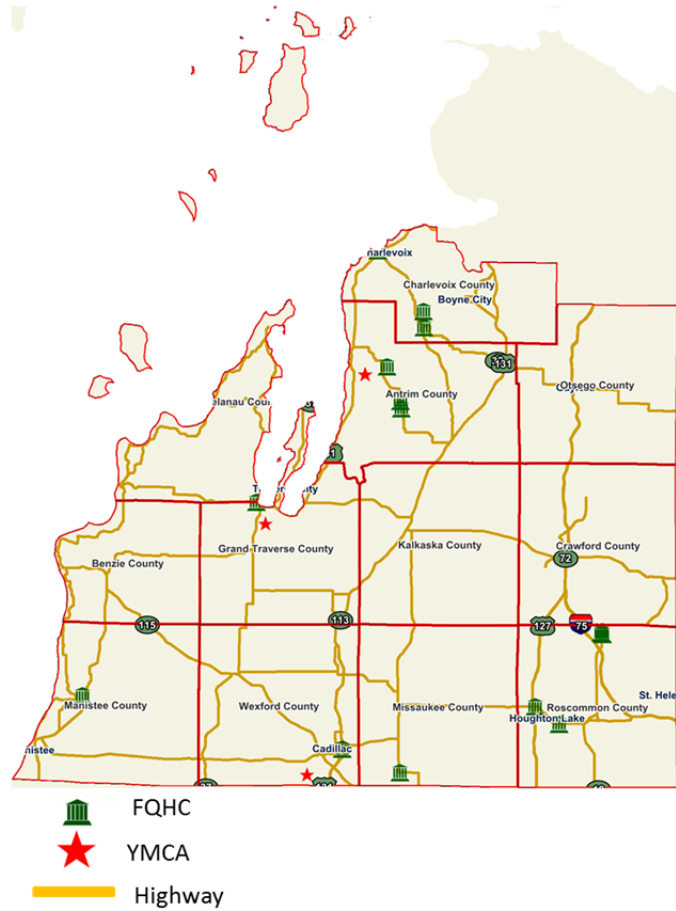
Location of People with Diabetes Risk Factors

The target population is individuals with risk factors for diabetes. The target population was determined using the demographic description and lifestyle preferences of each PRIZM segment found in the northwest area of Michigan's Lower Peninsula. Segments with demographic characteristics associated with a higher prevalence of diabetes were combined to form a profile. The demographic and socioeconomic characteristics included are:

- Education Attainment: less than a four-year college degree
- Household Income: $50,000 or less per year
- Age: segment age ranges that overlapped or contained the age group of 45 to 84 year olds

Based on these three characteristics the following PRIZM segments were found to be at high risk of developing diabetes: 38,39,40,41,42,43,44,45,46,48,49,52,53,54,55,56,57,58,59,60,61,64,65,66. There are 66 PRIZM segments. In general, as the segment number increases, the socioeconomic status decreases. As mentioned previously, each segment has a unique demographic and socioeconomic description based on several indicators including income, life stage, age range, presence of kids in the household, home ownership, employment, education, and race and ethnicity. For a detailed description of each segment, visit **http://www.claritas.com/MyBestSegments/Default.jsp?ID=30&id1=1027&id2=&webid=1**

To verify that these segments also had high-risk lifestyle behaviors that could lead to diabetes, additional analyses examined their likelihood of being physically active, consuming fruits and vegetables, and watching over 20 hours of television per week. It was found that these segments were among the least likely to be physically active and to consume fruits and vegetables, and among the most likely to watch more than 20 hours of television per week.

Map 2.1 shows the concentration of the target segments within each zip code in the northwest of Michigan's Lower Peninsula and **Map 2.2** shows the concentration within each census tract; the darker the orange, the higher the concentration of the target segments. **Appendix 3** provides a list of all the zip codes and census tracts in target geography and the number of households that are at high risk of developing diabetes.

The zip codes within the northwest of Michigan's Lower Peninsula where 80% or more households have one or more adults that fit this profile are: 49782, 48656, 48651, 49638, 48629, 49689, 49795 and 49613.

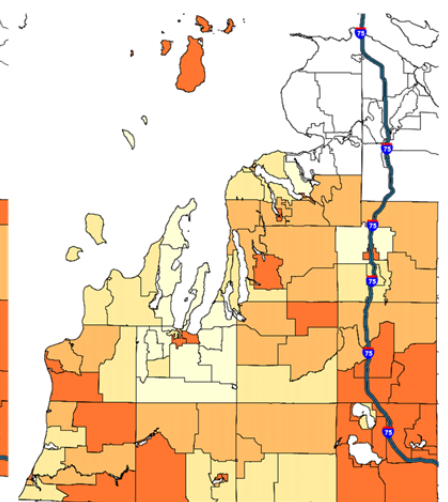**Map 2.1** Concentration of Target Population by Zip Code

Map 2.2 Concentration of Target Population by Census Tract
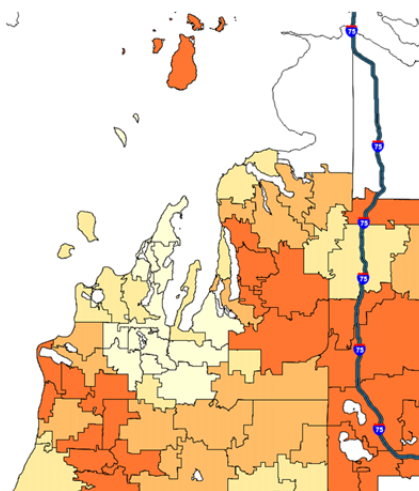
HH/ 100 HH*	Index †
80.46	136
67.59	114
54.55	92
34.33	58

*Number of adults per 100 households.
† Likelihood that the target population is located in a particular zip code compared to all zip code in the area of interest

HH/ 100 HH*	Index †
83.28	141
70.50	119
53.01	90
28.36	48

*Number of adults per 100 households.
† Likelihood that the target population is located in a particular census tracts compared to all zip code in the area of interest

Marketing[3]

Below are ways to reach your target audience. There are descriptions of how often and the types of print, radio, and television stations they read, listen to, and watch. For radio and television, the times and days of the week the audience is most likely to listen to or watch are listed as well.

See **Appendix 4** for detailed tables and information for the source information the descriptions below are based on. The majority of findings are based on the number of adults per 100 households. For these findings, it is possible to have more than 100 adults per 100 households as multiple adults can live in a household. A few of the findings are based on household consumption, for these findings the number of households cannot exceed 100.

Print Media Profile:
Among the segments at high risk for diabetes that live in the twelve northwest counties in Michigan's Lower Peninsula**:**
- Over 55 adults per 100 households in the target PRIZM segments read the Sunday newspaper, general editorials and women's magazines.
- Approximately the 82 adults per 100 households report frequently reading the newspaper; however, 101 adults per 100 households report reading the newspaper infrequently.
- Approximately 74 adults per 100 households report reading the Sunday newspaper and 65 adults per 100 households report reading the daily newspaper.

 If using print media as a method for reaching the target population, the Sunday newspaper has the most reach.

Radio Media Profile:
Among the segments at high risk for diabetes that live in the twelve northwest counties in Michigan's Lower Peninsula**:**
- Approximately 96 adults per 100 households listen to the radio less than less than 15 hours per week; however, 66 adults per 100 households listen to the radio more than 20 hours a week.
- The highest number of adults per 100 households listens to the radio Monday through Friday from 6 a.m. to 10 a.m. and from 10a.m. to 3p.m.
- The most frequently listened to radio stations are contemporary radio stations

If using radio media as a method for reaching the target population, the best time of day is 6 a.m. to 10 a.m. Monday through Friday on contemporary radio stations.

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[3] Marketing Profile is based on the PRIZM segments that are least likely to report exercising: segments 26, 31, 38-40, 42-49, and 52-66. There are 66 PRIZM segments the higher the number the lower the social-economic status. The segments are defined based on a combination of household characteristics (e.g., presence of kids), demographic characteristics, and economic characteristics. Nielsen's segmentation system has been tested and verified in various settings and geographic locations. The selected marketing avenues were selected based both on a high Market Potential Index as well as the number of people that could be reached.

Television Media Profile:
Note this profile captures usage of specific channels if you want to know the shows watched or frequency of viewing different shows, let DHPE know, and additional analysis can be run.

Among the Segments at High Risk for Diabetes that live in the twelve northwest counties in Michigan's Lower Peninsula:
- Over 103 adults per 100 households watch 20 hours or more of television per week.
- Over 85 adults per 100 households average at least a half hour of television between 8 p.m. and 11 p.m., 7:30 p.m. and 8 p.m., and 7 p.m.-7:30 p.m. Monday through Friday. Weekend viewing during these times is also around 85 adults per 100 households.
- Approximately 80% of households subscribe to cable or satellite television.

If using television media as a method for reaching the target population, the best time of day is 7 p.m. - 11 p.m. Monday through Friday.

Internet Media Profile:
Among the Segments at High Risk for Diabetes that live in the twelve northwest counties in Michigan's Lower Peninsula:
- Over 119 adults per 100 households use the internet 0 to 17 times per month.
- Approximately 57% own their own computer.
- Approximately 43 adults per 100 households use the internet frequently – 28 or more times per month.
- Almost half of households (48%) have access to the internet at home.
- Approximately 15 adults per 100 households use the internet via a cell phone or smart phone.

If using the internet as a method for reaching the target populations keep in mind that less than half of the target segment has access to the internet at home. Internet use for most users in the target segments is low.

Attitude Towards Media:
Over 60 users per 100 households in the target population feel magazines, newspapers, radio and television ads give useful information. The target segments are more likely to agree that television is the most trusted media.

Grocery Shopping Habits
Over 54 users per 102 households in the target segments grocery shop at a Walmart Supercenter or similar store (e.g. Meijer or Target Super Store).

Approximately 40 users per 100 households in the target segments do their grocery shopping within three to five miles of their home.

Retailer and Shopping Habits:
Walmart appears to be the store that the target segments shop at most often. Meijer was not included in the survey but since it has similar attributes as Walmart, it would have likely ranked high among the stores most frequented.

Restaurants:
McDonalds and Burger King are the two fast food restaurants where the highest number of users per household frequent. However, the target segments are less likely to frequent these restaurants compared to all segments.

Maps

The following maps may be useful in program planning efforts to identify potential target areas. **Maps 3.1 through 8.3** highlight geographic areas with demographic and socioeconomic status data that are associated with a higher risk of developing diabetes. **Maps 9.1 through 12.2** highlights geographic areas where health behaviors are exhibited that are associated with higher risk of developing diabetes. **Appendix 5** contains the demographic and socioeconomic status data provided in **Maps 3.1 through 8.3**. **Appendix 6.1-6.2** contains the health behavior data provided in **Maps 9.1 through 12.2**.

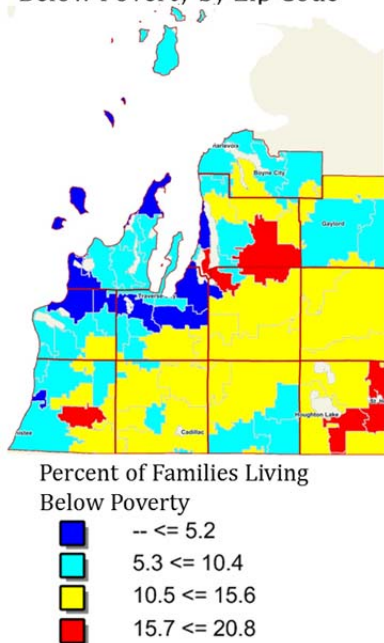## *Demographic and Socioeconomic Status Associated with Higher Risk of Diabetes*

Map 3.1 shows the percent of families living below poverty by zip code. The zip codes in red have the highest percent of families living below poverty, between 15.7% and 20.8%.

At least 15% of the families in the following zip codes are below poverty: 48651, 48625, 49659, 48656, 49676, 49619, and 49645.
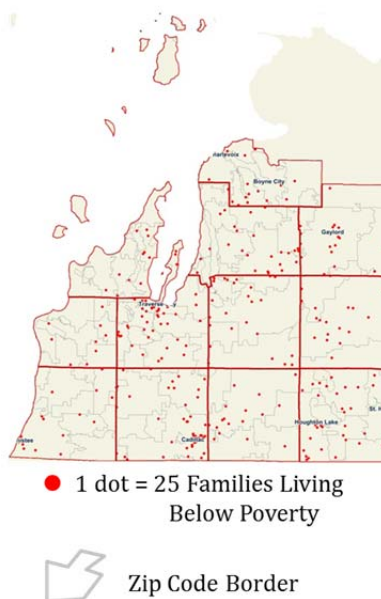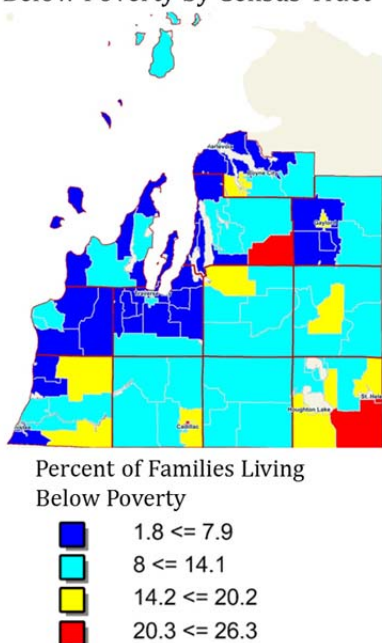
Map 3.2 shows the percent of families living below poverty by census tract.

Map 3.3 shows the number of families living below poverty.

Map 3.1 Percent of Families Living Below Poverty by Zip Code

Percent of Families Living Below Poverty
- ▆ (blue) -- <= 5.2
- ▆ (cyan) 5.3 <= 10.4
- ▆ (yellow) 10.5 <= 15.6
- ▆ (red) 15.7 <= 20.8

Map 3.2 Percent of Families Living Below Poverty by Census Tract

Percent of Families Living Below Poverty
- ▆ (blue) 1.8 <= 7.9
- ▆ (cyan) 8 <= 14.1
- ▆ (yellow) 14.2 <= 20.2
- ▆ (red) 20.3 <= 26.3

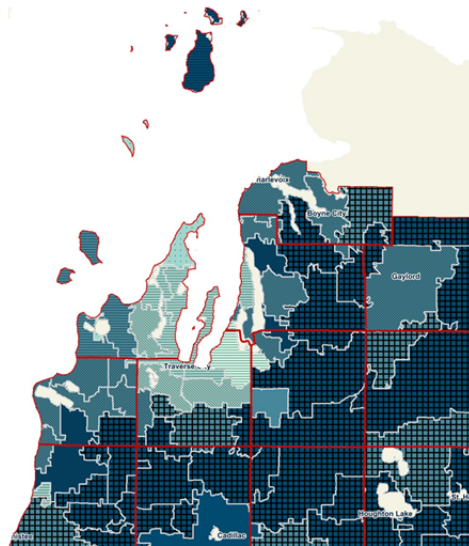● 1 dot = 25 Families Living Below Poverty

⬚ Zip Code Border

Map 4.1 shows the average annual household income and percent of adults 25 and older who have less than a four-year college degree by zip code. The areas with the darkest bluish-green color have the lowest average household income and the areas with the darkest lines have the highest percent of adults without a four-year college degree.
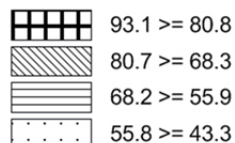
The following zip codes had average household income less than $40,000 per year: 48625, 48656, 49638, 48651, 49689, and 049659.

At least 90% of adults 25 years old and older have less than a four-year college degree in the following zip codes: 49680, 49795, 49689, 48625, 49638, 49667, 49645, 49644, 49632, 48656, 49659 and 49665.
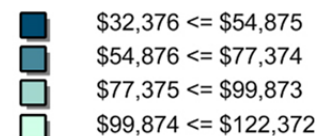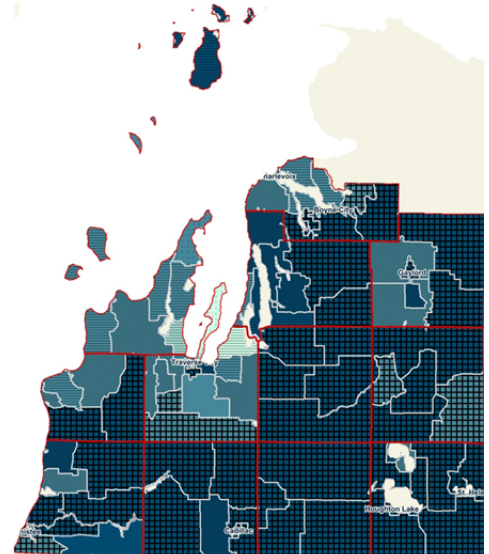
Map 4.1 legend:

- $36,289 <= $49,634
- $49,635 <= $62,980
- $62,981 <= $76,325
- $76,326 <= $89,670

Percent of Adults 25 and older with less than a four-year degree

- 93.1 >= 80.8
- 80.7 >= 68.3
- 68.2 >= 55.9
- 55.8 >= 43.3

Map 4.2 legend:

- $32,376 <= $54,875
- $54,876 <= $77,374
- $77,375 <= $99,873
- $99,874 <= $122,372

Percent of Adults 25 and older with less than a four-year degree

- 42.3 <= 54.9
- 55 <= 67.5
- 67.6 <= 80.1
- 80.2 <= 92.7

Map 4.2 shows the average annual household income and percent of adults 25 and older who have less than a four-year college degree by census tract.

Map 5.1 shows the percent of the population that is Hispanic by zip code. As the blue color darkens, the percent of the population that is Hispanic increases.
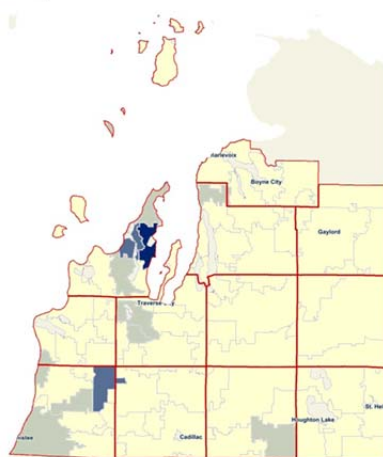
At least 5% of the population is Hispanic in the following zip codes: 49682 and 49653.

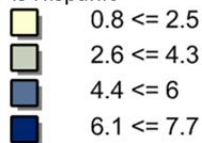Nationally Hispanics have a higher risk of developing diabetes.

Map 5.2 shows the percent of the population that is Hispanic by census tract.
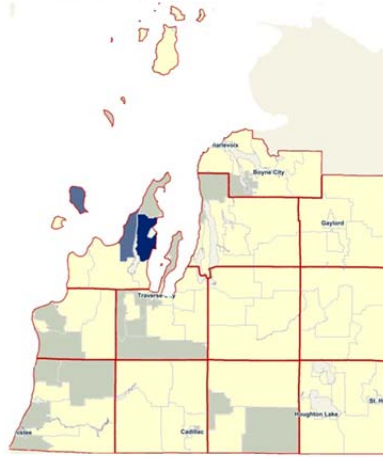
Map 5.3 shows the number of Hispanics.

Map 5.1 Percent of the Population that is Hispanic by Zip Code

Map 5.2 Percent of the Population that is Hispanic by Census Tract

Map 5.3 Number of Hispanics

Percent of the Population that is Hispanic
- 0.8 <= 2.5
- 2.6 <= 4.3
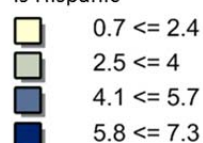- 4.4 <= 6
- 6.1 <= 7.7

Percent of the Population that is Hispanic
- 0.7 <= 2.4
- 2.5 <= 4
- 4.1 <= 5.7
- 5.8 <= 7.3
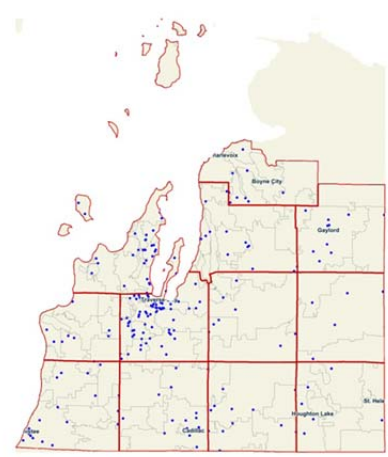
- 1 dot = 25 Hispanics
- Zip Code Border

Map 6.1 shows the percent of the population that is African American by zip code. As the red color darkens, the percent of the population that is, African American increases.

At least 1 % of the population is African American in the following zip codes: 49633, 49649, 49660, and 49689.

Map 6.2 shows the percent of the population that is African American by census tract.

Map 6.3 shows the number of African Americans.

Map 6.1 Percent of the Population that is African American by Zip Code
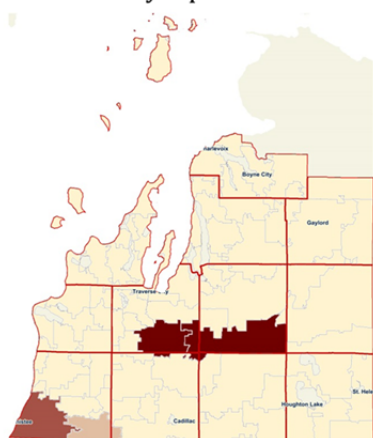

Percent of the Population that is African America

- -- <= 1.9
- 2 <= 3.9
- 4 <= 5.8
- 5.9 <= 7.7
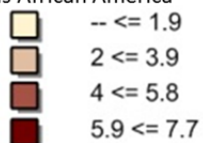
Map 6.2 Percent of the Population that is African American by Census Tract

Percent of the Population that is African America

- -- <= 4.8
- 4.9 <= 9.5
- 9.6 <= 14.3
- 14.4 <= 19
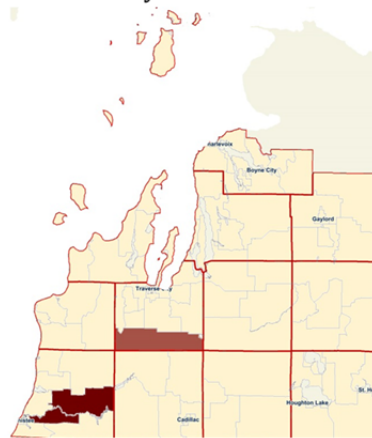
Map 6.3 Number of African Americans

- 1 dot = 25 African Americans
- Zip Code Border

Map 7.1 shows the percent of the population 45 through 64 years old by zip code. As the orange color darkens, the percent of the population that is between 45 and 64 years old increases.

At least 30% of the population is 45 to 64 years in the following zip codes
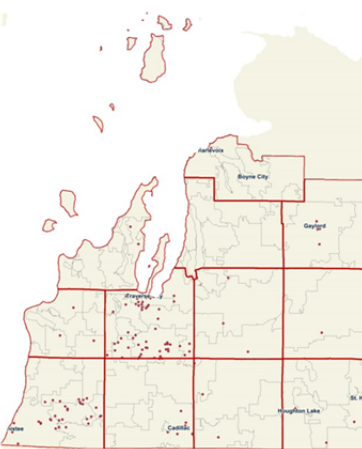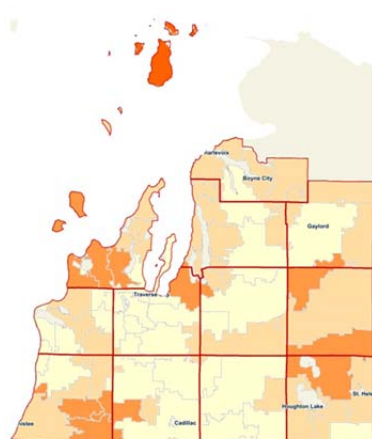49782, 49644, 49638, 49733, 49630, 49675, 49689, 49664, and 49619.

Map 7.2 shows the percent of the population 45 through 64 years old by census tract.

Map 7.3 shows the number of adults 45 through 64 years old.

Map 7.1 Percent of the Population Age 45 to 64 Years Old by Zip Code

Percent of the Population Age 45 to 64 Years Old
- 26.7 <= 30.6
- 30.7 <= 34.4
- 34.5 <= 38.3
- 38.4 <= 42.1
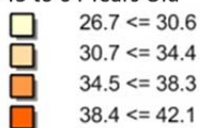
Map 7.2 Percent of the Population Age 45 to 64 Years Old by Census Tract

Percent of the Population Age 45 to 64 Years Old
- 21.1 <= 26.4
- 26.5 <= 31.6
- 31.7 <= 36.9
- 37 <= 42.1
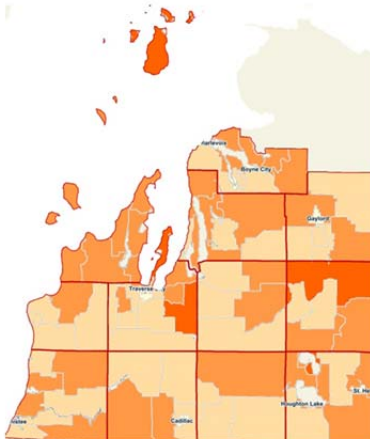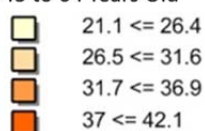
Map 7.3 Number of Adults Age 45 to 64 Years Old
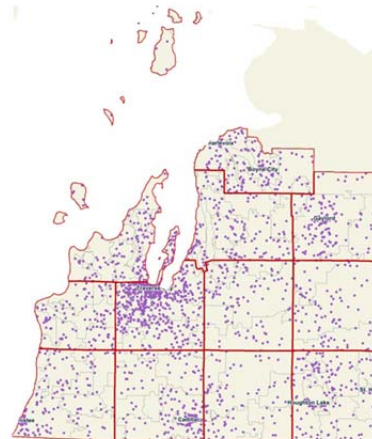
- 1 dot = 50 Adults 45 to 64 Years Old
- Zip Code Border

Map 8.1 shows the percent of the population 65 years old and older by zip code. As the orange color darkens, the percent of the population that is 65 years old and older increases.

At least 30% of the population is 65 years old and older in the following: 49636, 49654, 49670, 49644, 49675, 49635, 49613, 49629, 49648, 49630, and 48651.

Map 8.2 shows the percent of the population 65 years old and older by census tract.

Map 8.3 shows the number of adults 65 years old and older.

Map 8.1 Percent of the Population 65 Years Old and Older by Zip Code

Percent of the Population Age 65 Years Old and Older

- 10.2 <= 19.3
- 19.4 <= 28.3
- 28.4 <= 37.4
- 37.5 <= 46.4
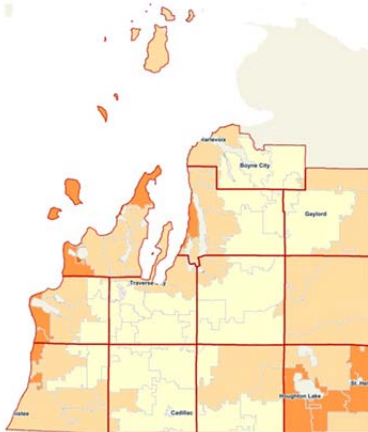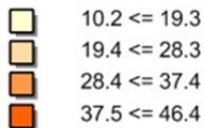
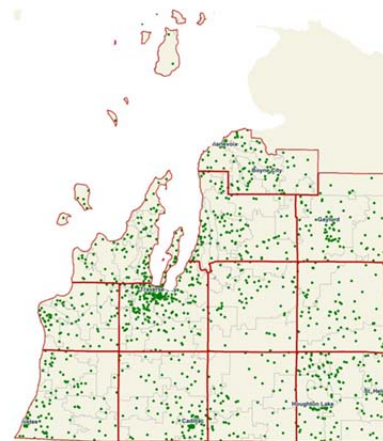**Map 8.2** Percent of the Population 65 Years Old and Older by Census Tract

Percent of the Population Age 65 Years Old and Older

- 10.6 <= 17.8
- 17.9 <= 25
- 25.1 <= 32.2
- 32.3 <= 39.4
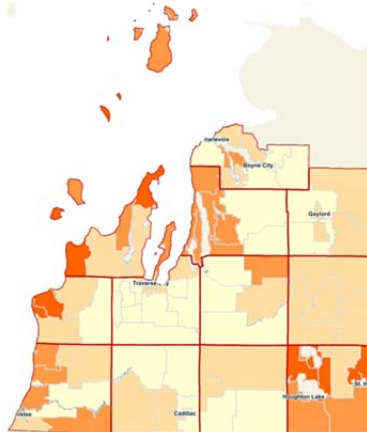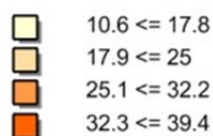
Map 8.3 Number of Adults 65 Years Old and Older


- 1 dot = 50 Adults 45 to 64 Years Old

Zip Code Border

Behaviors Associated with Higher Risk of Diabetes

Maps 9.1 and 9.2 show the likelihood adults have health insurance by zip code and census tract compared to the average adult within the twelve northwest counties in Michigan's Lower Peninsula. The darker the blue the *less likely* they are to report having health insurance.

Market Potential Index (MPI) is calculated based on the number of users per 100 households in each zip code or census tract divided by number of users per 100 households in the geographic area of interest times 100. It indicates the likelihood that households in a zip code or census tract are to display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicates they are

Map 9.1 Likelihood Adults Report Having Health Insurance by Zip Code Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula.
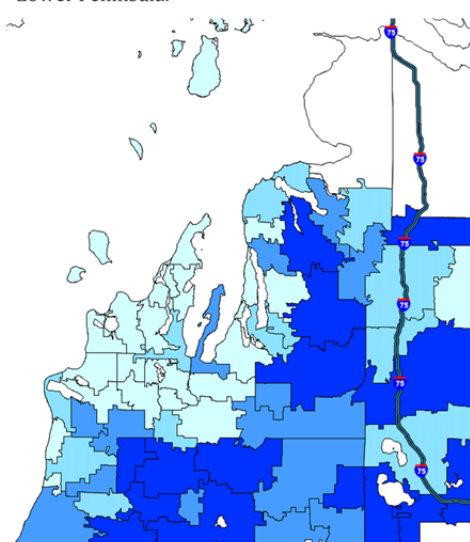
Users/100 HH*	MPI†
109.14	90
117.93	97
124.32	102
135.95	112

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a zip code display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

Map 9.2 Likelihood Adults Report Having Health Insurance by Census Tract Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula
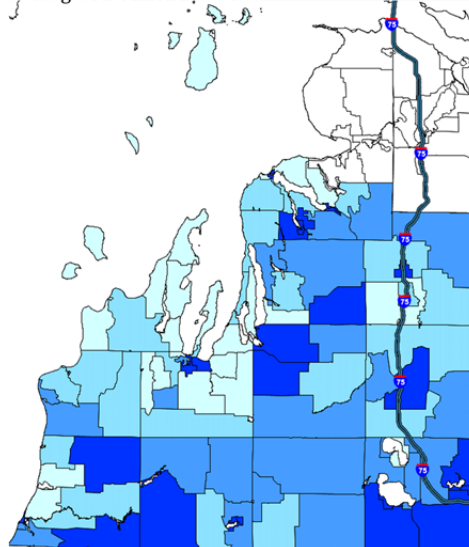
Users/100 HH*	MPI†
99.82	82
116.10	95
130.55	107
142.18	117

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a census tract display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest. An MPI of 100 indicates that they are as likely to display the behavior of interest as the average household in the geography of interest is.

The behavior of interest in **Maps 9.1** and **9.2** is having health insurance and the geography of interest is the twelve northwest counties in Michigan's Lower Peninsula (the geography of interest). The zip codes with the darkest blue color are 10% *less likely* to have insurance as compared to the average user in the geography of interest, and the zip codes with the lightest blue shading are 12% *more likely* to have insurance as compared to the average user in the geography of interest. The census tract with the darkest blue color are 18% *less likely* to have insurance as compared to the average user in the geography of interest and the census tract with the lightest blue shading are 17% *more likely* to have insurance as compared to the average user in the geography of interest.

Maps 10.1 and 10.2 show the likelihood households consume more or less fresh fruits and vegetables per month by zip code and census tract as compared to the average household in the twelve northwest counties in Michigan's Lower Peninsula (the target geography). The darker the green, the *less likely* the households are to consume as much fresh fruits and vegetables as the average household in the target geography*.*

Market Demand Index (MDI) is calculated based on the average consumption per household in each zip code compared to the average consumption in the geography of interest. It indicates the likelihood that households in a zip code or census tract have a higher or lower demand (or rate of consumption) for a particular product compared to the average for the geography of interest. An MDI of less than 100 indicates households are less likely to consume the product of interest. An MDI greater than 100 indicates households are more likely to consume the product of interest. A MDI of 100 indicates that they are as likely to consume the product of interest as the average household in the geography of interest is.

Map 10.1 Likelihood Households Consume More or Less Fresh Fruit and Vegetables in a One Month Period by Zip Code Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula
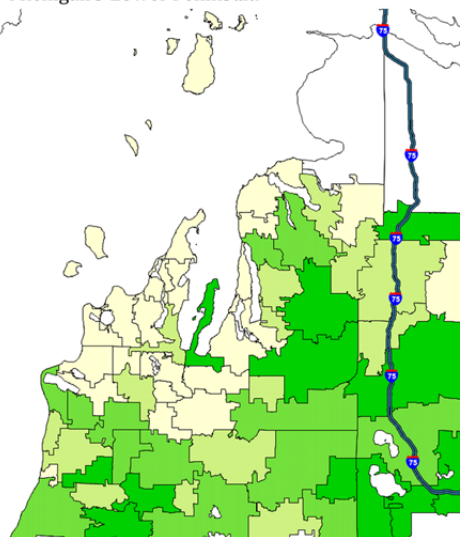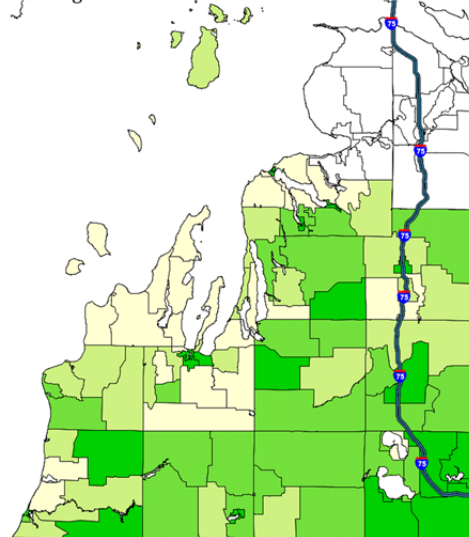

Pounds/Month*	MDI †
28.46	94
28.90	97
29.41	99
30.30	104

- Average number of pounds of fresh fruits and vegetables per month per household
- † MDI= Market Demand Index. MDI is calculated based on the average consumption per household in a zip code compared to the average consumption in the geography of interest. An MDI of less than 100 indicates adults are less likely to consume the product of interest. An MDI greater than 100 indicates households are more likely to consume the product of interest.

Map 10.2 Likelihood Households Consume More or Less Fresh Fruit and Vegetables in a One Month Period by Census Tract Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula

Pounds/Month*	MDI †
27.33	88
28.98	97
29.78	102
31.04	108

- Average number of pounds of fresh fruits and vegetables per month per household
- † MDI= Market Demand Index. MDI is calculated based on the average consumption per household in a census tract compared to the average consumption in the geography of interest. An MDI of less than 100 indicates adults are less likely to consume the product of interest. An MDI greater than 100 indicates households are more likely to consume the product of interest.

The product of interest in **Maps 10.1 and 10.2** is pounds of fresh fruits and vegetables consumed per month per household and the geography of interest is twelve northwest counties in Michigan's Lower Peninsula. The zip codes of darkest green are 6% *less likely* to consume fresh fruits and vegetables as compared to the average household in the target geography and the zip codes with the lightest yellow-green shading are 4% *more likely* to consume fresh fruits and vegetables as compared to the average household in the target geography. The census tracts of darkest green are 12% *less likely* to consume fresh fruits and vegetables as compared to the average household in the target geography, and the census tracts with the lightest yellow-green shading are 8% *more likely* to consume fresh fruits and vegetables as compared to the average household in the target geography.

Maps 11.1 and 11.2 show the likelihood adults in exercise 2 or more times per week at home by zip code and census tract compared to the average user in the twelve northwest counties in Michigan's Lower Peninsula (the target geography). The darker the purple, the *less likely* they are to report exercising 2 or more times per week.

Market Potential Index (MPI) is calculated based on the number of users per 100 households in each zip code or census tract divided by number of users per 100 households in the geographic area of interest times 100. It indicates the likelihood that households in a zip code or census tract are to display the behavior of interest compared to the average for the geography of interest. An MPI of less than

Map 11.1 Likelihood Adults Exercise 2 or More Times per Week at Home by Zip Code Compared to the Average Adult in 12 Northwest Counties in Michigan's Lower Peninsula
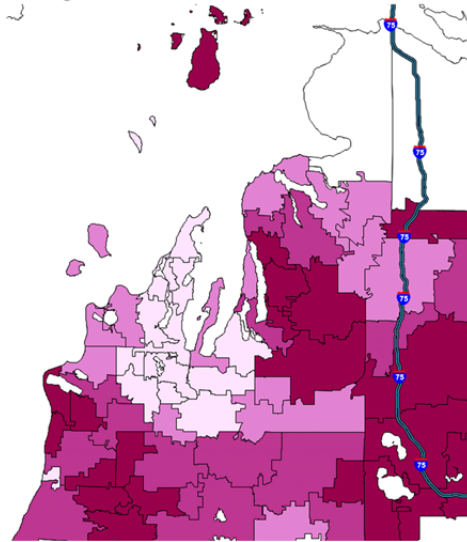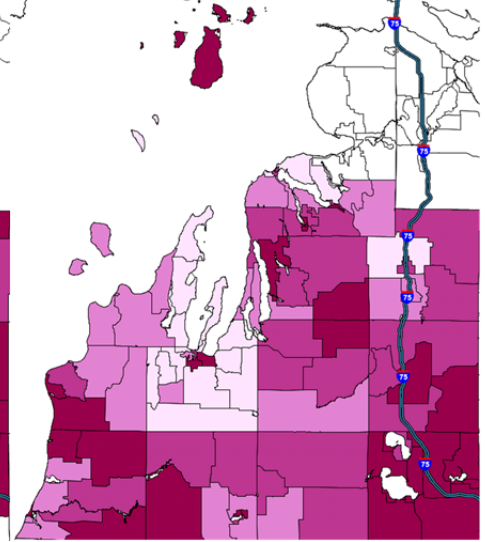
Users/ 100 HH*	MPI†
34.38	78
40.19	92
45.98	105
54.02	123

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a zip code display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

Map 11.2 Likelihood Adults Exercise 2 or More Times per Week at Home by Census Tract Compared to the Average Adult in 12 Northwest Counties in Michigan's Lower Peninsula

Users/ 100 HH*	MPI†
32.95	75
38.83	89
45.78	104
57.52	131

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a census tract display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

100 indicates they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest. An MPI of 100 indicates that they are as likely to display the behavior of interest as the average household in the geography of interest is.

The behavior of interest in **Maps 11.1** and **11.2** is exercising two more times per week at home and the geography of interest is the twelve northwest counties in Michigan's Lower Peninsula. The darkest purple zip codes are 22% *less likely* to exercise 2 or more times per week at home as compared to the average adult in the target geography. The zip codes with the lightest purple shading are 23% *more likely* to exercise 2 or more times per week at home as compared to the average adult in the target geography. The darkest purple census tract are 25% *less likely* to exercise 2 or more times per week at home as compared to the average census tract in the target geography. The areas with the lightest purple shading are 31% *more likely* to exercise 2 or more times per week at home as compared to the average adult in the target geography.

Maps 12.1 and 12.2 show the likelihood adults watch 45 or more hours of television per week by zip code and census tract compared to the average user in the twelve northwest counties in Michigan's Lower Peninsula (the target geography). The red areas are *more likely* to report watching 45 or more hours of television per week.

Market Potential Index (MPI) is calculated based on the number of users per 100 households in each zip code or census tract divided by number of users per 100 households in the geographic area of interest times 100. It indicates the likelihood that households in a zip code or census tract are to display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicates they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest. An MPI of 100 indicates that they are as likely to display the behavior of interest as the average household in the geography of interest.

Map 12.1 Likelihood Adults Watch More Than 45 Hours of TV per Week by Zip Code Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula

Users/ 100 HH*	MPI †
49.40	110
46.79	104
44.30	98
39.95	89

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a zip code display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

Map 12.2 Likelihood Adults Watch More Than 45 Hours of TV per Week by Census Tract Compared to the Average User in 12 Northwest Counties in Michigan's Lower Peninsula

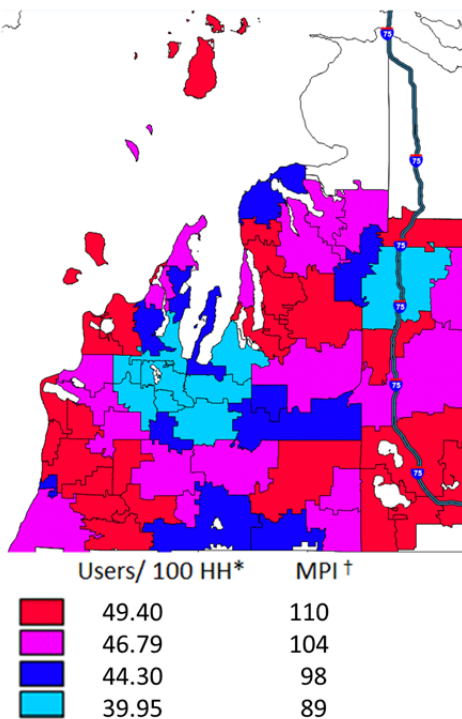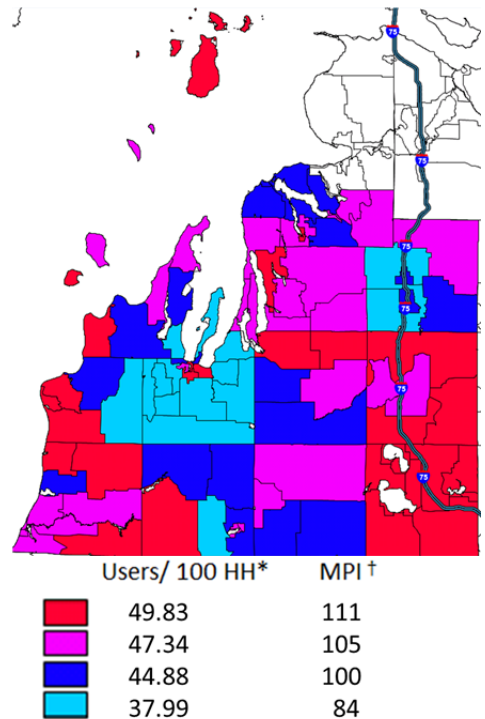| Users/ 100 HH*	MPI †
49.83	111
47.34	105
44.88	100
37.99	84

*Number of adults per 100 households.
† MPI = Market Potential Index. Likelihood that households in a census tract display the behavior of interest compared to the average for the geography of interest. An MPI of less than 100 indicated they are less likely to display the behavior of interest. An MPI greater than 100 indicates they are more likely to display the behavior of interest.

The behavior of interest in **Maps 12.1** and **12.2** is watching 45 or more hours of television per week and the geography of interest is the average user in the twelve northwest counties in Michigan's Lower Peninsula. The red zip codes are 10% *more likely* to watch 45 or more hours of television per week as compared to the average user household in the target geography and the zip codes in light blue are 11% *less likely* to watch 45 or more hours of television per week as compared to the average household in the target geography. The red census tracts are 11% *more likely* to watch 45 or more hours of television per week as compared to the average user household in the target geography, and the census tracts in light blue are 16% *less likely* to watch 45 or more hours of television per week as compared to the average household in the target geography.

Understanding the Built Environment

Table 2 below provides a list of the number of certain types of businesses located in the target geography. The North American Industry Classification System (NAICS) codes were used to identify businesses. The following NAICS codes were used:

- 621111   Medical Offices (except Mental Health Specialist)
- 445120   Convenience food stores
- 447110   Gasoline stations with convenience stores
- 445110   Grocery stores
- 813110   Churches
- 722511 - 722515   Restaurants
- 722515   Coffee shops
- 812112 - 812113   Beauty Salons
- 611110   Elementary and Secondary Schools
- 713940   Fitness Centers

Appendix 7 provides a list of each of these types of businesses that are in the target geography.

Table 2. Number of Select Types of Businesses within the Target Geography

	Number of Businesses
Medical Offices (except Mental Health Specialist)*	306
Federally Qualified Health Centers ‡	14
Farmer's Markets	26
Grocery Stores	151
Churches	537
Elementary and Secondary Schools	285
YMCA	7
Fitness Centers	84
Senior Centers	23

* This includes dermatologists, cardiologist, and other specialty offices in addition to primary care offices. Due to changes in coding, it is not easy to separate the type of medical office based on the NAICS codes. Also medical offices are listed multiple times because each provider can register themselves as a business. Attempts were made to de-duplicate the number based on the street address. However, all listings are provided in Appendix 7.

‡ Health Resource and Service Administration Data Warehouse
http://datawarehouse.hrsa.gov/Download_HCC_LookALikes.aspx. Accessed March 8, 2013

Farmer's Markets

Map 13 shows the locations of farmer's markets throughout the target geography.

Map 13 Farmer's Market

◆ Farmer's Markets

Zip Code Border
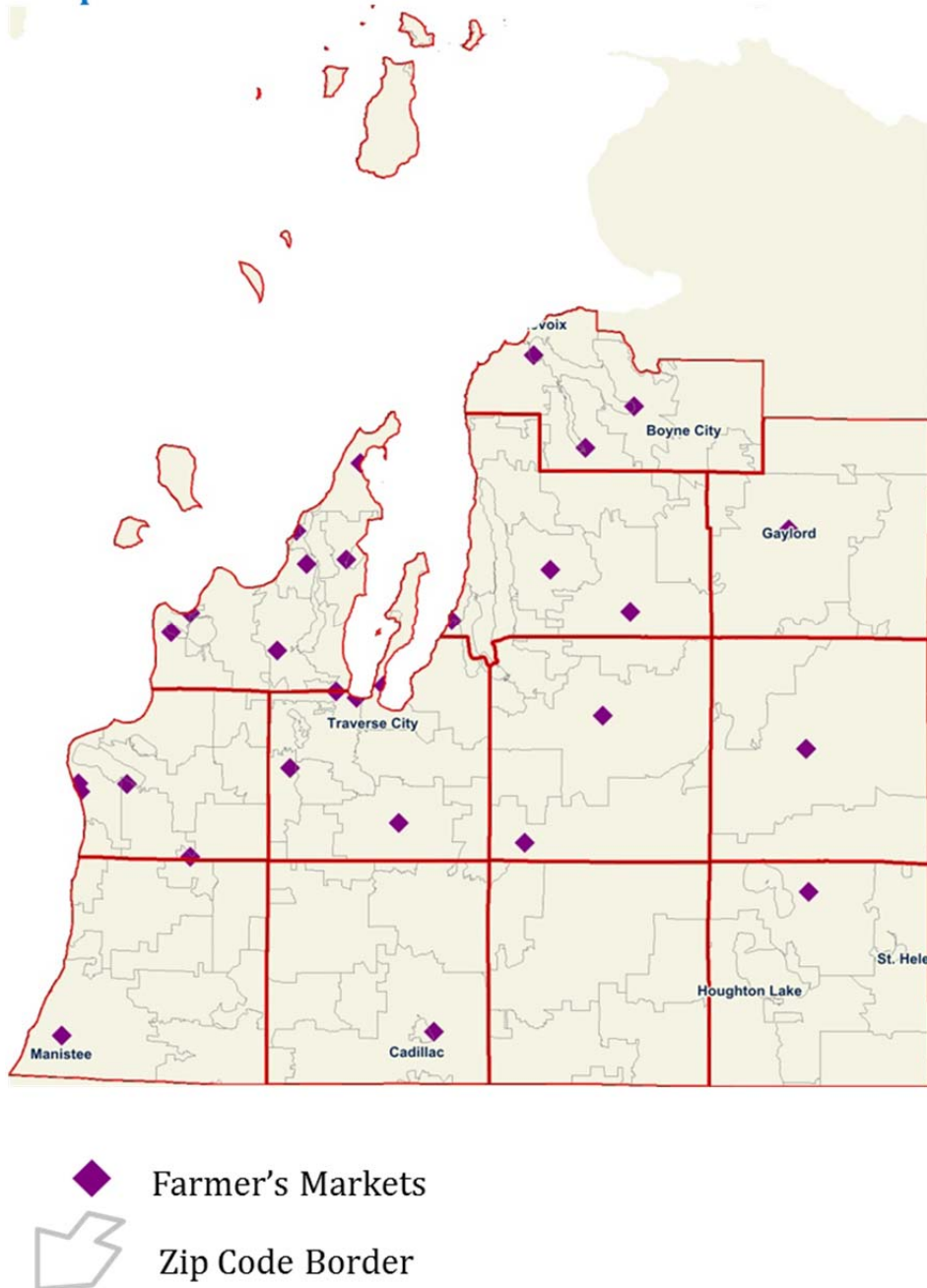
Large Employers

Table 3 below provides a list of business that have 500 or more employees within the geography of interest. Businesses with multiple locations may have registered the number of employees for each location OR the number for all locations. (e.g., McDonald's might say it has 10,000 employees because all locations combined have 10,000). **Appendix 8** provides a list of all businesses, large employers, and business with multiple locations. The business lists may contain the same business multiple times for several reasons: 1) they have multiple locations, 2) different spellings of the same business were registered with the same address, 3) the business is registered under more than one NASIC code, and 4) it was register with the same name more than once or with a different employee size.

Table 3. Large Employers within the Geography of Interest

Company Name	Address	City/State	Zip Code
EAST JORDAN IRON WORKS INC	301 SPRING ST	East Jordan, MI	49727
LITTLE RIVER CASINO RESORT	2700 ORCHARD HWY	Manistee, MI	49660
PACTIV CORP	2246 UDELL ST	Filer City, MI	49634
OTSEGO MEMORIAL HOSPITAL	825 N CENTER AVE	Gaylord, MI	49735
SHANTY CREEK RESORTS	5780 SHANTY CREEK RD	Bellaire, MI	49615
SLEEPING BEAR DUNES VISTORS	PO BOX 517	Glen Arbor, MI	49636
ASHLEIGH'S	6300 US HIGHWAY 31 N	Acme, MI	49610
TURTLE CREEK CASINO	7741 M 72 E	Williamsburg, MI	49690
GRAND TRAVERSE RESORT & SPA	6300 US HIGHWAY 31 N	Williamsburg, MI	49690
GRAND TRAVERSE RESORT & SPA	6300 US HIGHWAY 31 N	Acme, MI	49610
CHERRY GROWERS INC	6331 US HIGHWAY 31	Grawn, MI	49637
MUNSON HEALTHCARE CTR	1105 SIXTH ST	Traverse City, MI	49684
MEIJER PHARMACY	3955 N US HIGHWAY 31 S	Traverse City, MI	49684
MEIJER	3955 N US HIGHWAY 31 S	Traverse City, MI	49684
BIMBO BAKERIES USA	2314 SYBRANT RD	Traverse City, MI	49684
MEIJER	8605 E 34 RD	Cadillac, MI	49601
MERCY HOSPITAL CADILLAC	400 HOBART ST	Cadillac, MI	49601
AVON AUTOMOTIVE	805 W 13TH ST	Cadillac, MI	49601

Appendix 1: Project and Technical Notes:

Behavioral Risk Factor Surveillance System (BRFSS) is a primary source of diabetes data at the county and state level for local health departments and other agencies. Through a grant award, from NACDD the Directors of Health Promotion and Education (DHPE) are able to offer data and analysis at smaller units of geography through a database maintained by the Nielsen Company.

Technical Background
Nielsen is a global marketing and advertising research company that offers software to businesses and government agencies through two software programs: ConsumerPoint and PrimeLocation. Nielsen is one of the world's leading suppliers of marketing information, media information and TV ratings, online intelligence and mobile measurement.

Nielsen PRIZM Segments
Community populations are categorized into 66 segments based on socioeconomic rank, life stage, and urbanization. The 66 segments each have unique demographic descriptions based on income, age class, age range, presence of kids in the household, home ownership, employment, education, and race and ethnicity. Each segment also has specific lifestyle preferences that are typical for the segment such as media preferences, shopping preferences, and typical behaviors. More information may be accessed at the following site:
http://www.claritas.com/MyBestSegments/Default.jsp?ID=30&SubID=&pageName=Segment%2BLook-up

Appendix 2: Enhanced Demographics

Due to the length of this appendix it is in a separate accompanying document. This appendix contains detailed demographics and socioeconomic characteristics beyond those provided in **Table 1**.

Appendix 3: Target Concentration Reports

There are approximately 137,700 households in the twelve northwest counties in Michigan's Lower Peninsula. Of these approximately 81,403 households (or 59%), have one or more members who are at high risk of developing prediabetes.

Due to the length of this appendix, it is in a separate accompanying document. The information in this appendix was used create Maps 2.1 and 2.2.

Appendix 4: Media Profiles
Media profiles were conducted for the target area of interest using PRIZM household segments that have characteristics associated with a higher risk of developing prediabetes and diabetes as the

target population. For this report, the geographies of interest are twelve northwest counties in Michigan's Lower Peninsula.

Due to the length of this appendix, it is in a separate accompanying document. The information in this appendix was used create the marketing descriptions provided in the Marketing section of this report.

Appendix 5: Select Demographics by Zip Code

Due to the length of this appendix it is in a separate accompanying document. This information in this appendix was used in the creation of Maps 3.1 through 8.3.

Appendix 6.1 Behaviors Associated with Higher Risk of Diabetes by Zip Code

Due to the length of this appendix it is in a separate accompanying document. The information in this appendix was used create Maps 9.1 through 12.2.

Appendix 6.2 Behaviors Associated with Higher Risk of Diabetes by Census Tract

Due to the length of this appendix it is in a separate accompanying document. The information in this appendix was used create Maps 9 through 12

Appendix 7. List of Select Businesses

Due to the length of this appendix it is in a separate accompanying document. The information in this appendix was used to estimate the number of business in **Table 2**.

Appendix 8. Large and Multi Site Businesses

Due to the length of this appendix it is in a separate accompanying document. The information in this appendix was used to develop the large employer list in **Table 3**.