MINNESOTA STATE DEMOGRAPHIC CENTER
DEPARTMENT OF ADMINISTRATION

CHARACTERISTIC DISTRIBUTIONS OF THE POPULATION IN MINNESOTA

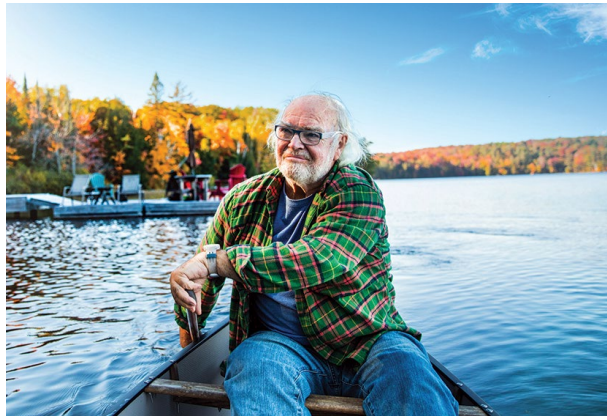
ERIC A. GUTHRIE, PHD | DECEMBER 2023

Racial and ethnic

Age

Educational attainment

Income (and poverty)



The distribution of population characteristics provides a view into the social and economic history of an area, its current vitality, and its prospects moving into the future. A distribution reflects the decisions made by past and current residents and will impact decisions by those yet to come. When thinking about how characteristics in a population are distributed, there are many different elements that can be considered depending on the needs being analyzed.

The types of characteristic distributions being studied will depend on the questions being asked, and those questions will inform the datasets that will be consulted. While many organizations look at population or characteristic distributions for different reasons, most will default to datasets produced by the U.S. Census Bureau because of their completeness and comparability across all areas of the nation.

While the variables on which the distribution of the population can be analyzed are wide and varied, there are several that people more commonly ask to see. Some common characteristic distributions requested from the State Demographic Center are: **racial and ethnic, age, educational attainment, income and poverty**.

Data Sources

All of the above characteristics are available from a multitude of sources, but the most common and agreed upon source from which these data are drawn is the U.S. Census Bureau's American Community Survey (ACS). The ACS data is collected monthly and published annually as pooled 12 month estimates for all geographies over 65,000 residents. All areas, regardless of population size, can find estimates in the ACS data that pool 60 months (five years) of data, which are also published annually. To get full statewide distributions, a data user will need to use the five-year estimates. The most recent set of five-year estimates published by the Bureau are the 2021 five-year estimates, which pool responses from 2017 to 2021.

For the most basic demographic data, down to the block level, the data user can also consult the decennial census. The most recent decennial data (2020) contains data about the racial and ethnic distribution of the population across the whole of the state. The decennial census is a great place to start to get a view of the distribution of the races in the state.

Distribution of Characteristics in Minnesota's Population

The State of Minnesota's population, like most states in the nation, is highly concentrated in cities. There are significant social and historical reasons for this pattern of dispersion. When we think about the distribution of the state's population, Minnesota's agrarian past becomes apparent. We can see in Figure 1 below that the state has relatively wide distribution of population and utilization of the land throughout the state. There are wide swaths of the state that are very sparsely populated. In fact, the color that dominates most of the figure is the lowest level of density, 0 to 22 persons per square mile. In addition to seeing where there are relatively few people, we can also see where there are dense pockets all over the state and how those populations came to be in particular areas. It is an easy observation that will surprise no one, but the Twin Cities and the surrounding metro area has the highest density in the state. It is also easy to pick out St. Cloud, Duluth, Moorhead, Mankato, and Rochester, among others as being those places in the state with the highest densities.

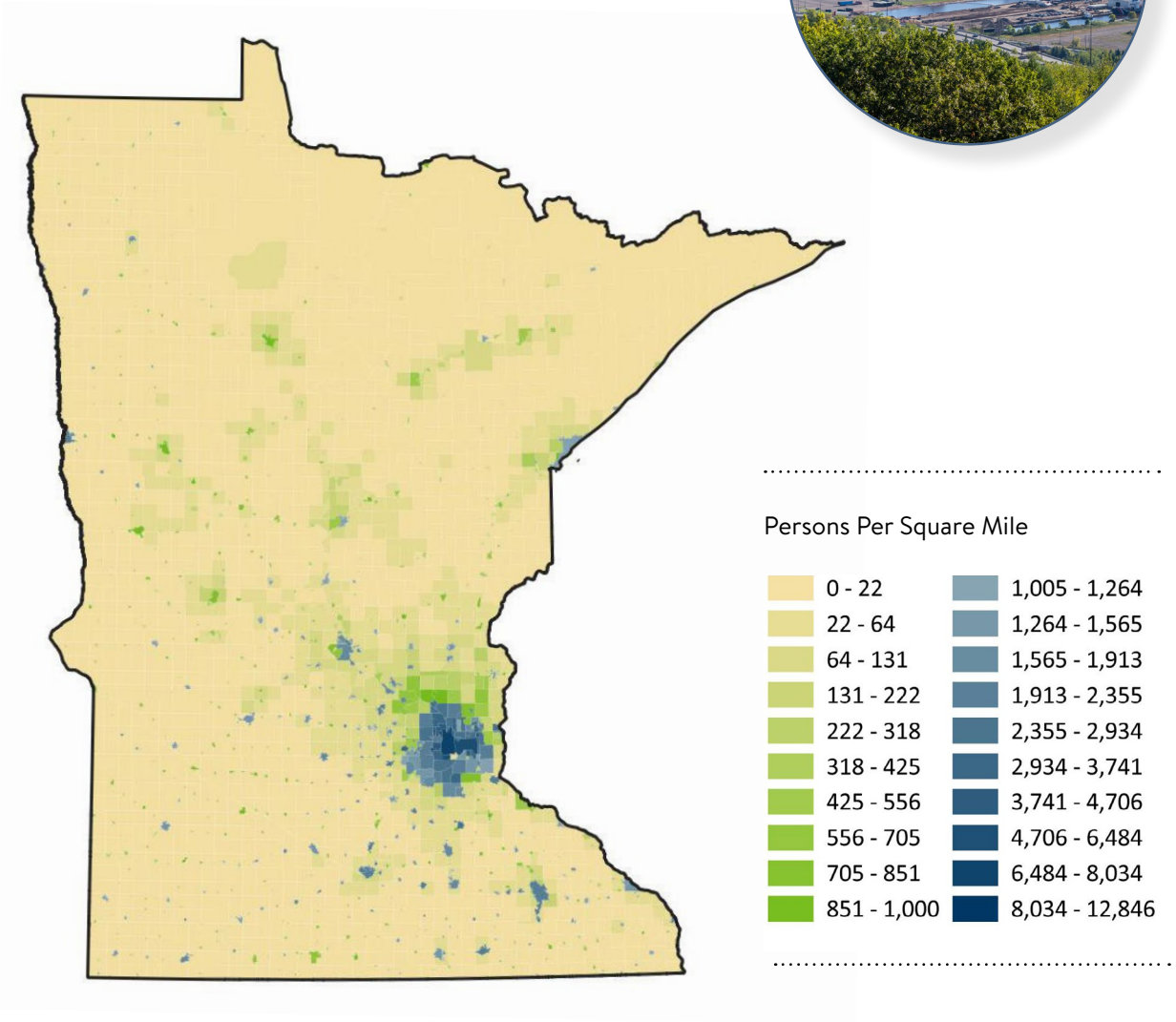
Along with being able to pick out some of the state's larger cities from the population concentrations, we can also see various natural and man-made aspects of the physical geography of the state through the population distributions. In Figure 1, the route or paths of physical features such as Interstate 90 and US Highway 14 are visible as they branch out of Rochester and progress westward across the state. Similarly, the routes of Interstate 35 can be seen going north out of the Metro towards Duluth and Interstate 94 leaving the Metro and progressing through Saint Cloud towards Moorhead.

When we look at the placement of feature such as roadways, it is important to consider those elements were not placed haphazardly. Roads have been placed on established routes that evolved from trade and hunting routes. Those routes

became hubs of population and often evolved through the years from trade routes to railroad lines, and then to highways. The development had not been universal or balanced, but the effects are obvious from a view of the population densities and their proximity and alignment.

Natural physical features have been very important to the development of the state. It is well known that the port in Duluth and the position of the Twin Cities just south of the headwaters of the Mississippi River have been boons to the local and state economies. We can also see natural elements through the population distributions, for example we can follow the Minnesota river backwards as it progresses south from its confluence with the Mississippi River through the Valley of the Jolly Green Giant around Le Suer. In Mankato it turns northwest and cuts a path to its source, Big Stone Lake, on the border of South Dakota and Minnesota in Big Stone County.

Figure 1: Population Density



RACIAL AND ETHNIC DISTRIBUTIONS OF MINNESOTA'S POPULATION

Total Population Distribution

An interesting aspect of the state's population dispersion is the ways in which it is different for different groups.

The next five maps (Figure 2 through Figure 7) are dot density maps that reveal more detail of the state's population distributions in a more nuanced way than the previous choropleth map in Figure 1. The first map in the series represents the distribution of the total population, while the following detail the distributions of the major race groups other than the group who identifies as white. A dot density map of the population that identifies as white was not included because it would look nearly identical to the total population distribution map in Figure 2.

Similar to Figure 1, some physical and political features in Figure 2 are easy to pick out. It is easy to see many cities across the state. It is easiest to find them in the western and southwestern parts of the state. One aspect of cities in this type of map is many of the cities that can be picked out appear to be roughly circular rather than conforming to the specific municipal boundaries of a city. This highlights the difference in the natural settlement of the population versus the development of political entities with specific boundaries.

As with the map in the previous figure, we can also see some natural features of the state through the population dot densities. You can clearly see the area in the northeastern part of the state that has very few residents. Those areas are the Iron Range and the surrounding park lands such as the Boundary Waters Canoe Area. Numerous lakes are also visible as zero population areas right next to very densely populated areas. One of the best examples is Lake Mille Lacs in the north central part of the state.

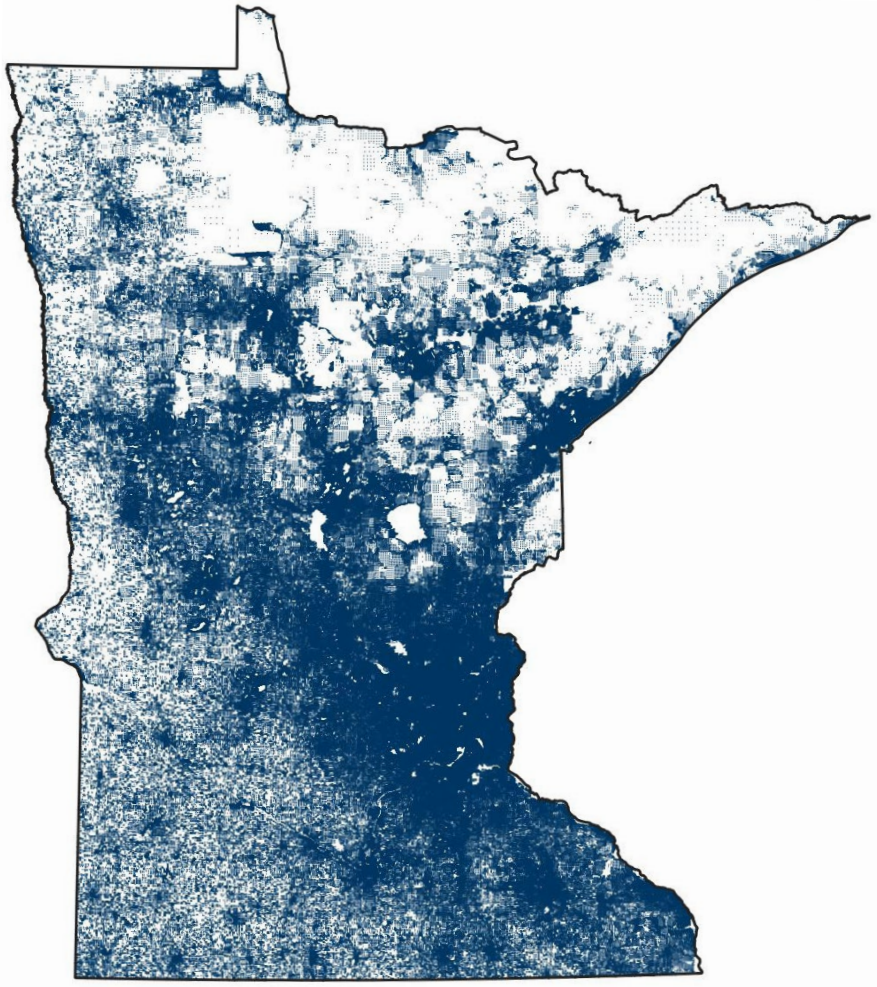


Figure 2: Detailed Population Density – Total

1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

Distribution of the African American Population

The distribution of the African American population, at first glance, seems to have a very different distribution than other populations in the state. It is true that there are unique aspects to all of the population we are going to review, but there are a few key points that need to be remembered when analyzing these maps. The first is most people in the state live in cities. According to the 2021 American Community Survey data, over 83 percent of Minnesotans live in what the Census Bureau calls a place, i.e., an incorporated city or Census Designated Place. Further, over 65 percent of the state's population lives in a place with a population over 10,000 residents. The second important point is there are individuals of all the major racial and ethnic identifications across the populated portions of the state. Individual groups' densities vary by group and geography, but there is a presence across the state.

When we apply those reminders to our analysis of the African American population, we can see the distribution seems fairly typical. Most of the African American population in the state live in the state's larger cities. The metro area, Mankato, Rochester, Moorhead, Duluth and several other cities are clearly visible through the population distributions in Figure 3. Additionally, we can see populations in our small towns and the sparsely populated areas of the state.

It is going to be noticeable that the distributions for all of the racial and ethnic groups are going to be right outside of the urban areas. This relates to the observation about the white population representing the large majority of the population. In fact, the aggregate population for the populations in Figure 2 through Figure 7 present less than 24 percent of the state's population. That lopsided proportion is going to mask some of the similarities across population characteristics.

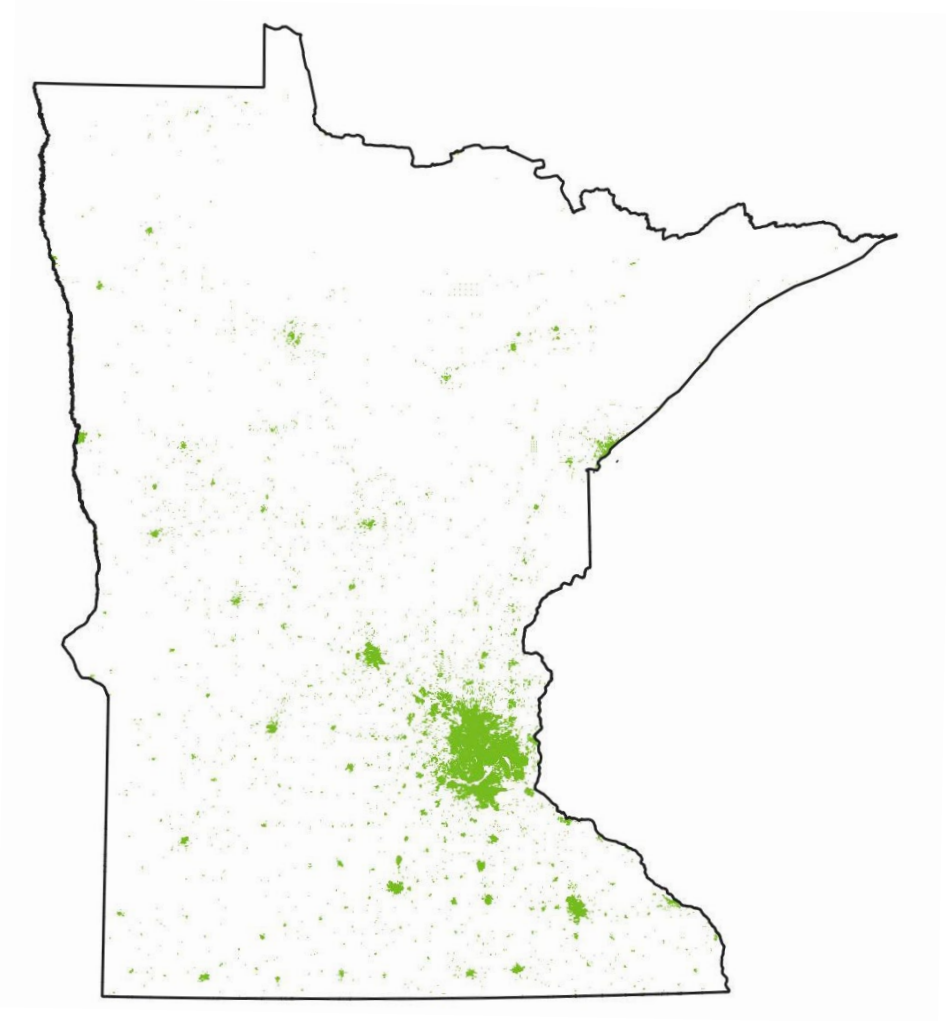


Figure 3: Detailed Population Density – African American

1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

Distribution of the Native American and American Indian Population

As the distribution of the American Indian population in Figure 4 is reviewed, it is apparent that the two major analysis themes, urban population and wide dispersion, hold true for the American Indian population, but with some variation.

The urban portions of the distribution are still clearly visible, but there are also multiple concentrations in the more rural parts of the state. The Anishinaabe reservation in the northern half of the state is clearly visible through the concentrations. The Red Lake, White Earth, Fond du Lac, Leech Lake, Grand Portage and Mille Lacs Reservations can all be picked out easily. The Bois Forte Band area is visible as well, but it is a little harder to spot if you are not looking for it. The Dakota communities in the southern part of the state can be seen, but they are harder to pick out than the large reservations north of the Twin Cities. The differences in the distributions between the Dakota in the south and the Anishinaabe in the north can be traced to the historical legacy of the U.S.-Dakota War of 1862.

While a large portion of the Native American Population in the state live in the Twin Cities Metro Area, there are also a significant number that are dispersed widely throughout the state. This is true both on and off the native lands in the state.

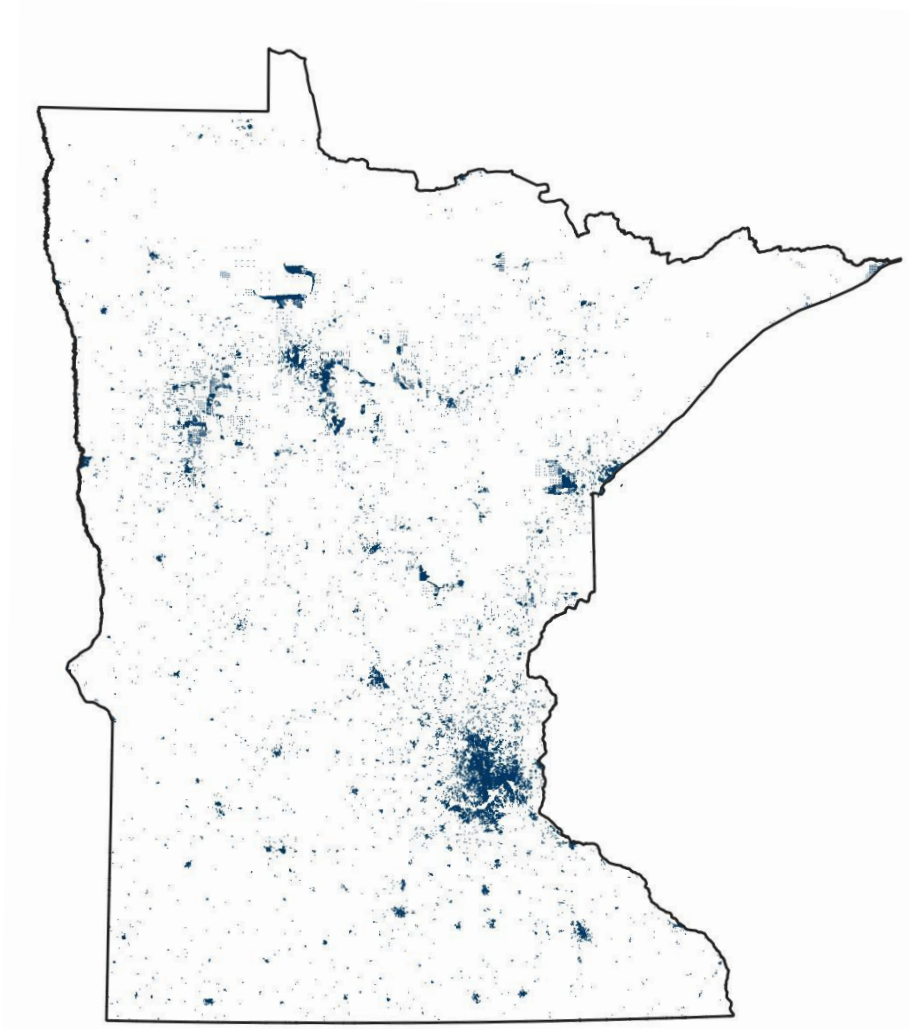


Figure 4: Detailed Population Density – American Indian

1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

Distribution of the Asian American Population

The distribution of the population identifying as Asian is very diverse and from a wide geographic expanse. This population can be from anywhere between the regions of Northern Siberia to Southern Indonesia and from the cities of Istanbul to Tokyo.

At first, the distribution of the population identifying as Asian in the state appears to be very similar to that of the African American population. That is true, but on closer inspection, one clear difference is the degree to which the Asian American population has increased in proportion to the African American population in the northern suburbs of the Metro Region. This difference would warrant further investigation, but the relationship can be observed in the population distributions.

The population identifying as Asian also has an apparent preference for cities and towns. The distribution clearly favors settlement in cities over unincorporated areas.

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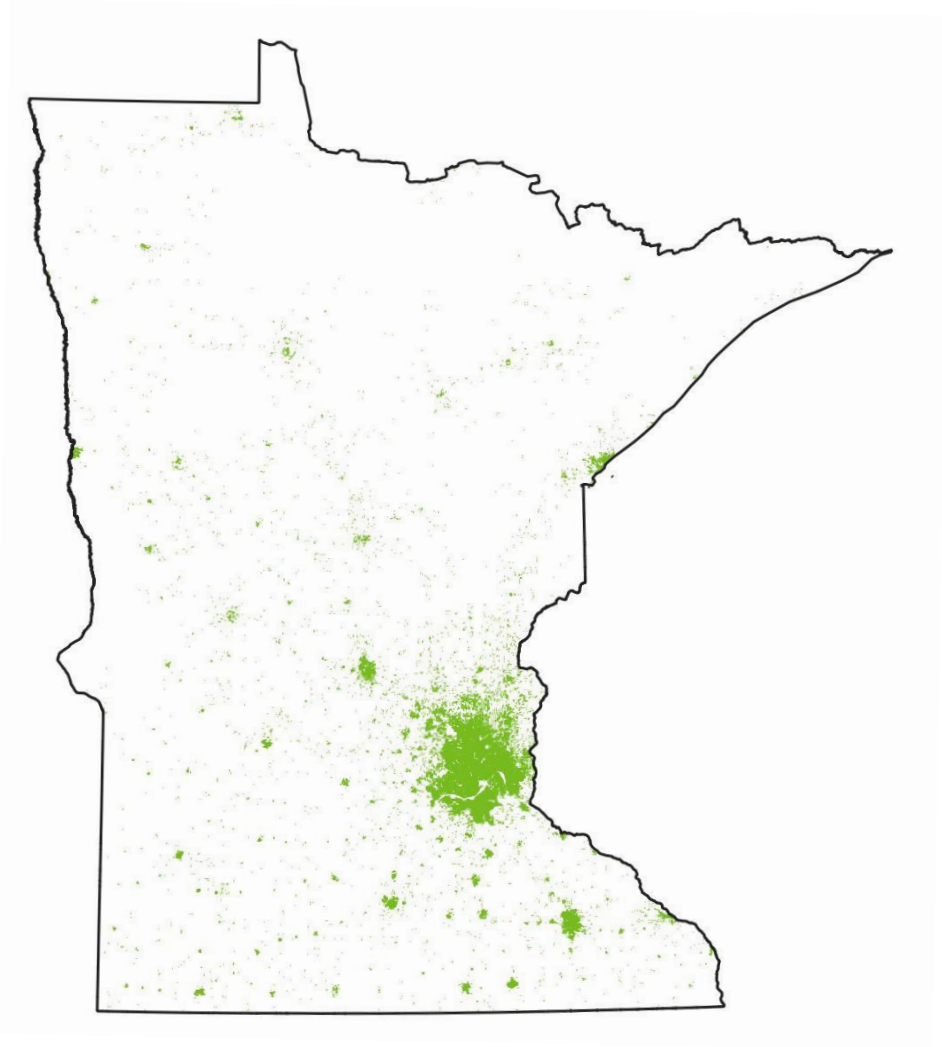


Figure 5: Detailed Population Density – Asian American

1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

Distribution of the Multiracial Population

The population identifying as more than one race is one of the fastest growing categories in the state. This population is difficult to conceptualize outside of the statistical arena as they compose the most diverse group in this discussion. The population identifying as Asian seemed large and monolithic due to its wide geographic expanse and varied cultural landscape. However, the population identifying as more than one race is even more diverse as it represents any combination of the basic race groups or write-in responses to the 2020 Census. New coding introduced in the 2020 Census brings this diversity to light in a new way as it seeks to more accurately represent how respondents view themselves.

Given the predominantly white population of the state, it is likely surprising to some that the geographic expanse for the distribution of the multiracial group is wider than for any other group discussed.

The multiracial group is sometimes difficult to describe as it is not really a traditional racial group as we think about them. The multiracial grouping is really a proxy or catchall for any combination of racial groups. In addition, the U.S. Census Bureau also changed the coding procedure for the race and ethnicity questions to better capture respondents' self-described race. This makes clearer how disbursed the multiracial category is when you realize that many identify as white.

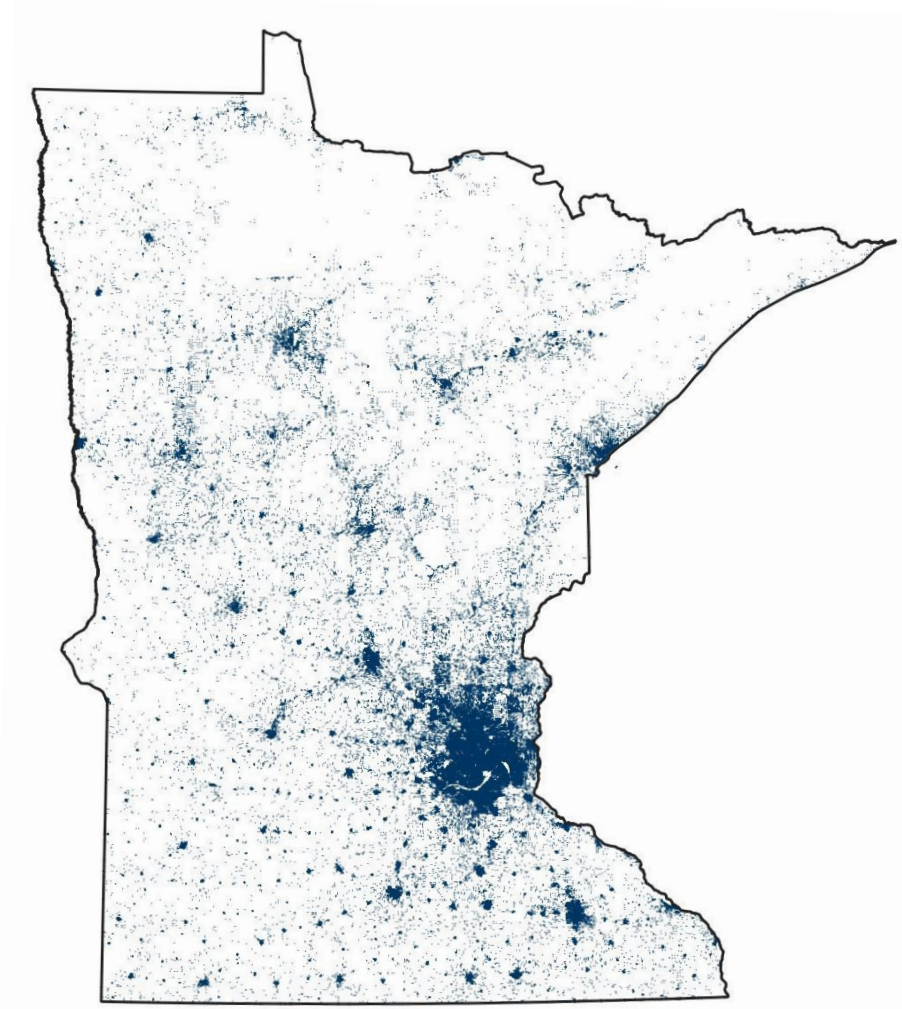


Figure 6: Detailed Population Density – Two or More Races

1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

Distribution of the Hispanic or Latino Population

The Hispanic or Latino population distribution, as seen in Figure 7, is more similar to the multiracial distribution than any other group. This makes sense as the Hispanic or Latino ethnicity is not a racial category. Persons indicating Hispanic or Latino can be of any race. So much like the multiracial groups, the Hispanic or Latino groups is comprised of many different groups whose only commonality may be the exogenous designation of Hispanic or Latino. The Hispanic or Latino groups are likely as heterogeneous as is the multiracial group.

The Hispanic or Latino population distribution is more similar to the multiracial than any other group.

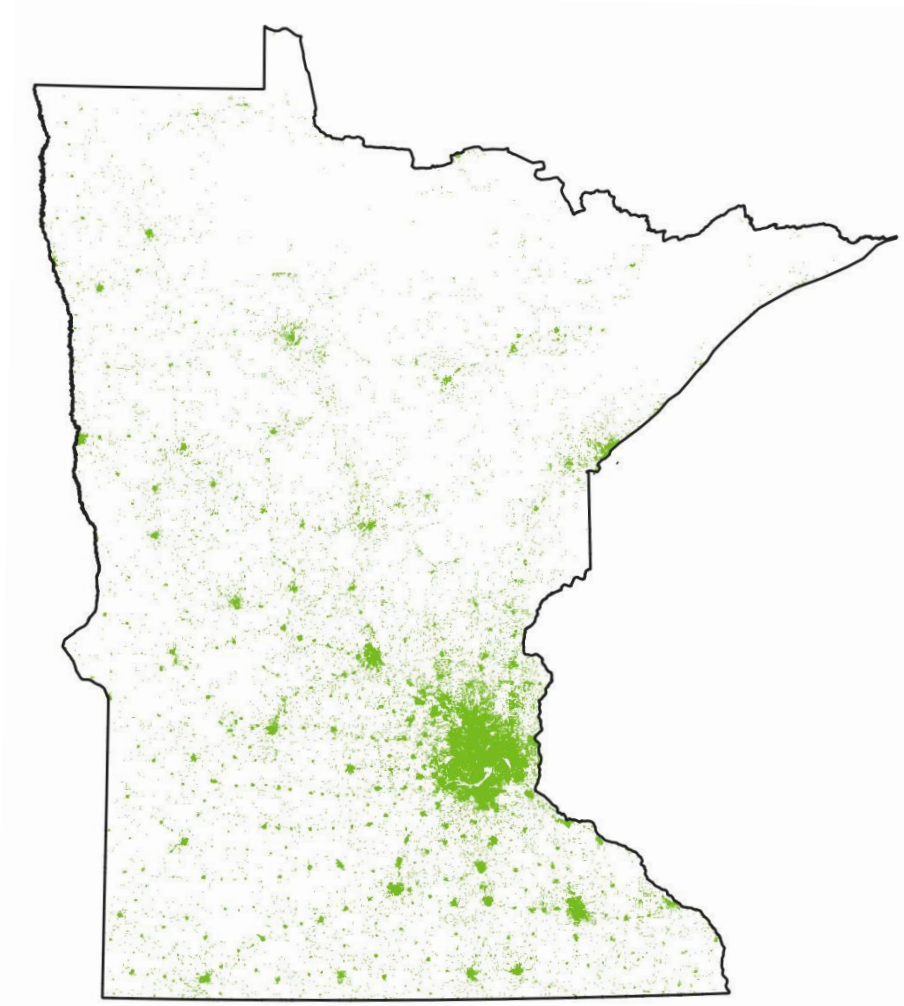


Figure 7: Detailed Population Density – Hispanic or Latino

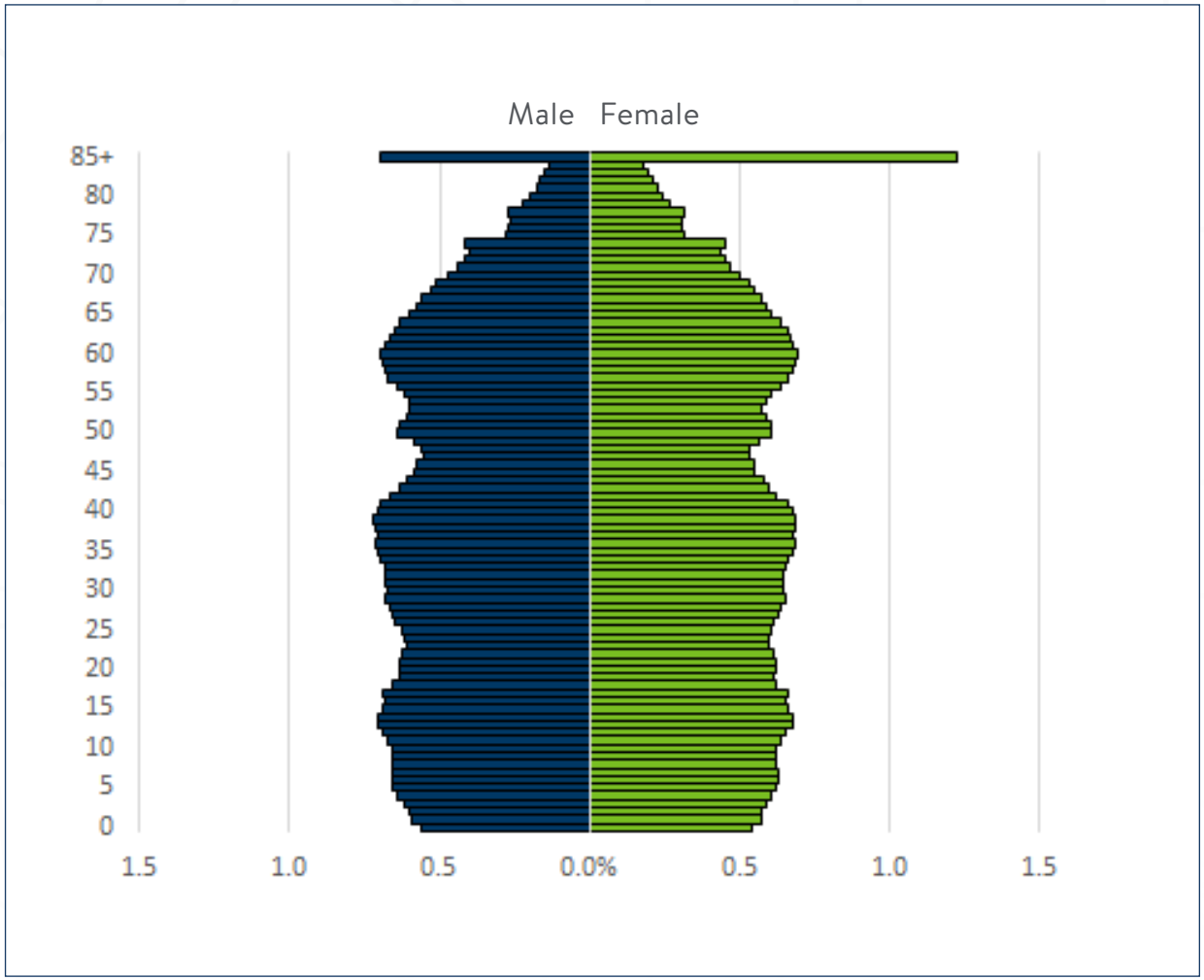
1 Dot = 1 Person
Locations are approximate, populations are evenly distributed across blocks

AGE DISTRIBUTION OF THE POPULATION

When we think about how age and sex are distributed, the first step is to recognize that geographic distribution is not the only way for distribution of characteristics to be considered.

The graphic used in Figure 8 is called a population pyramid. The graphic contains a lot of data, and likely more than is useful for consideration on individual levels. The population pyramid has 86 bars (one for each age group 0 to 85 plus) and one division for sex, making for a total of 172 data points on display. Those are too many datapoints to be useful individually, but the purpose of this type of graphic is

Figure 8: Population Pyramid –Age Distribution by Sex



Source: U.S. Census Bureau, 2021 Population Estimates, Special Tabulation

not granular detail. Rather, the goal of a population pyramid is to give an impression of the overall population's structure, or the relative position of individual age and sex levels to all the other groups' levels.

When the structure of the population is considered, a few points become apparent. The first is there is a rather large "bulge" in the population that is currently crossing the 65-year mark. This group is the baby boom group. We are currently seeing about half of that group having crossed the 65-year mark, with the modal age group crossing in the next two to three years.

A second observation is the relative size of each generation currently in the population. The 85 and over group in the population pyramid is clearly the largest individual bar, which is due to it being an open-ended age group that has been increasing drastically over the last couple of decades. The increases can be attributed to changes in lifestyles and increases in medical science that have been successful in bringing down mortality rates and allowing people to live longer and healthier lives. This group has been increasing at a rate that there is talk of increasing the upper bound for the last age group in federal statistical publications. The next visible generation is the Baby Boom generation, which can be seen as represented by the points between the ages of about 55 to 75 years of age. Generation X can be seen as the contraction of the pyramid between the ages of roughly 40 to 54. The echo of the Baby Boom can be seen in the shape of the Millennial Generation aged between about 20 and 39 years. Under 20, the structure of the Generation Y and subsequent reductions in fertility in the very young age groups are visible.

A final point that can be seen in the figure is the difference in the relative size of the oldest group by sex. There are clearly more women than men in the 85 and over group. What is less apparent is there are slightly more males in the youngest age groups. The sex difference in births is a long-observed sex-based variation, and the difference in the mortality among the sexes as they progress on the life course has many explanations and theories including life course and life stress differences. Whatever the ultimate cause of the differences, these can be seen in the data and reinforce long standing social and biological understandings observed regarding the sex differences at birth, in life course, and aging.

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Median Age by Census Tract and County

The median age varies across the state, and different patterns can be seen when the geographic perspective is changed. These different patterns have real implications for the governmental and social units that make up those geographic units.

When looking at the state by census tract, as in Figure 9, a great deal of variation is notable. There is a swath of younger tracts that cut across the state from the northwest to the southeast. The largest concentration of tracts with a relatively young median age can be seen in the Twin Cities metro area. That is to be expected with the inherent population momentum that is found with younger populations. That means that a population that is younger will tend to stay younger as compared to the rate of change for a population that has a higher median age. An easier way to think about the dynamic is to say a younger population will have more children, which will further bring down the median age. We see the opposite in the more remote and less urbanized parts of the state. In those more rural and isolated places, people are getting older and there are few to no children being born or migrating in to maintain a lower median age. A similar distribution can be seen in Figure 2 where the densest population densities could be seen on a northwest to southwest axis of the state. This shows in a natural way, the correlation between population size and lower median ages in the state.

Figure 10 below, county level median age, tells a slightly different story than does the tract level data in Figure 9. When we look at the county level data, it is apparent that the state is younger than the tract level data would have us believe. This view of the data also makes more sense when the state median age is considered, which is under 39 years of age for 2020.

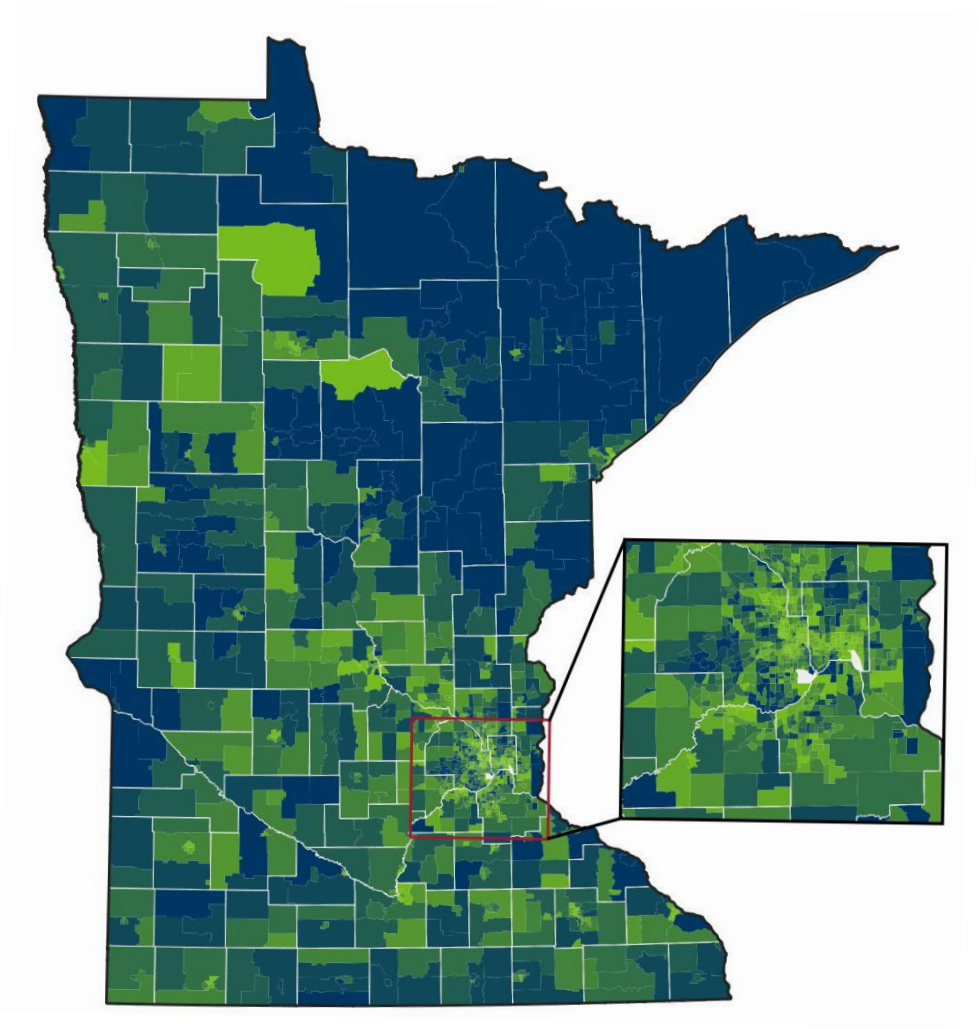

Figure 9: Median Age by Census Tract

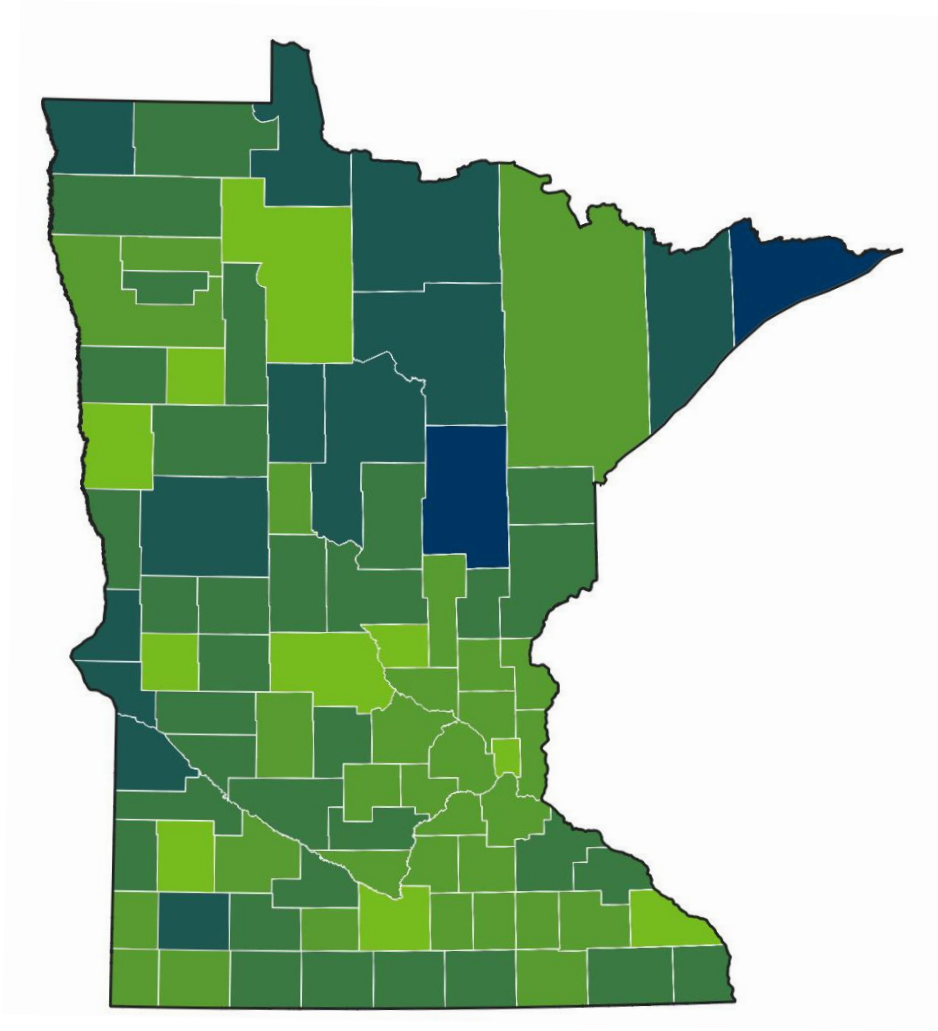

Figure 10: Median Age by County

The relationship between tract and county level data can be misleading without further investigation. For examples, consider Aitkin and Saint Louis counties in northeastern Minnesota. Both counties are similarly situated in the state geographically, according to the map in Figure 9, and have similar age structures. When we look at those same counties in Figure 10, Aitkin continues to show a high median age while Saint Louis does not. The previous observation that youth tends to be correlated with more urban or populated areas will be important.

In Aitkin County, there are not any significant population centers. The City of Aitkin is the largest population center with just over 2,000 residents. St. Louis county, in contrast has several population centers that serve as attractors to bring down the median age.

Duluth alone accounts for over 43 percent of the total population of Saint Louis County. When we add the next three largest cities to Duluth, Hibbing, Hermantown, and Virginia, the proportion jumps to over 60 percent. The effect on the median age we would expect to see is a decrease with the inclusion of those four population centers. That is exactly what we do see with the overall county median age being 40.9, and the estimated median age without those four places being 48.3. What we see is the effect of the large number of relatively small places serving to increase the median age by over seven years for the more sparsely populated areas of the county.

There is a similar but opposite dynamic in action for Aitkin County. While the City of Aitkin is the largest place in Aitkin County, and its median age is 10 years younger than the county, it only accounts for just over thirteen percent of the county's population. That, along with the other significantly older cities and townships, is not sufficient to reduce the median age for the county. So, while Aitkin and Saint Louis Counties are similarly situated geographically in the state, the characteristics of the places within the counties are different enough to produce a significantly different result.

DISTRIBUTION OF EDUCATIONAL ATTAINMENT IN THE STATE

Median Level by Census Tract

The distribution of educational attainment in the state varies within relatively narrow bounds. More variation is more evident at census tract level versus the county level. That is logically consistent as aggregating larger populations or areas will regress characteristics towards their respective means.

When viewed at the census tract level in Figure 11, we can see variation in the state between a median educational level of high school all the way up to bachelor's degree. The bachelor's degree tracts are all in very urban areas in the metro area. There are several areas around the state where the median level of educational attainment is the associate degree level. Those areas tend to be around institutions of higher education. They can be seen around Mankato, Rochester, and Saint Cloud most prominently. Areas can also be observed around Winona and Bemidji where the median level of educational attainment is at the associate level.

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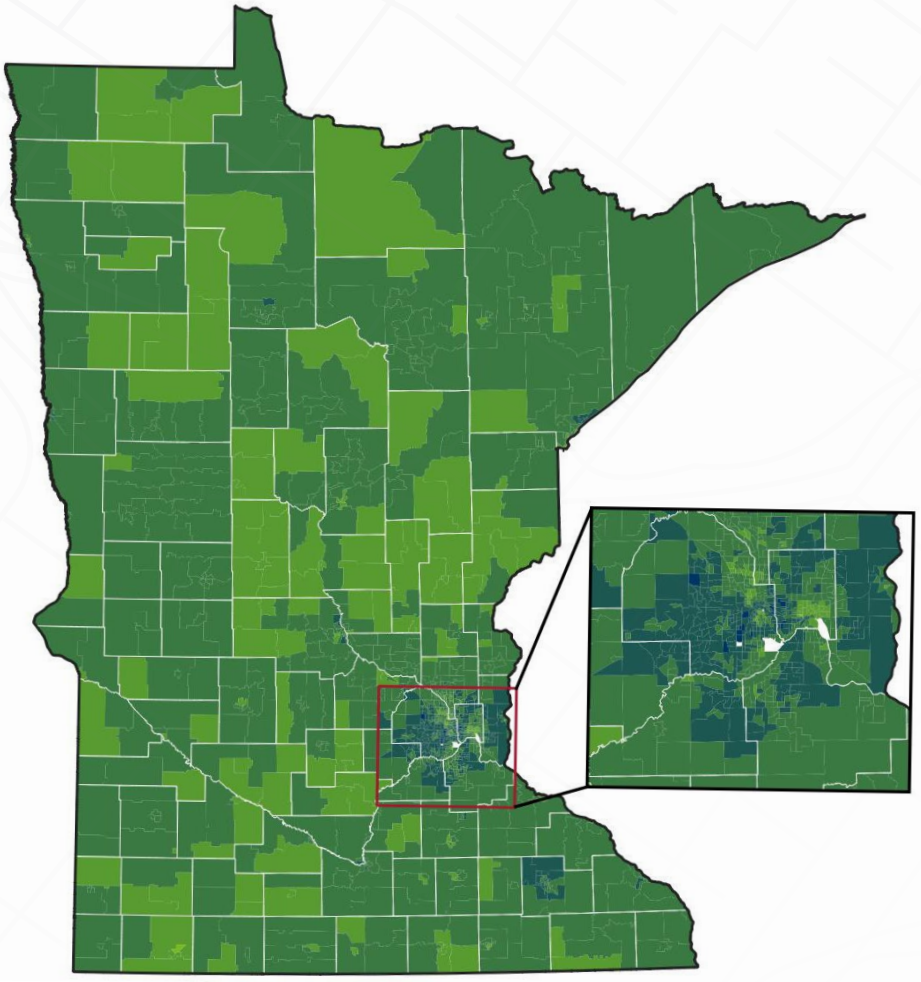

Figure 11: Median Level of Educational Attainment by Census Tract

Median Level by County

When county level educational attainment is viewed in Figure 12, it is readily apparent that there is little variation and the median level shifts between high school and some college everywhere except for Hennepin County where the median level is an associate degree. Hennepin County likely owes a large part of the higher level of educational attainment to the presence of the University of Minnesota as well as several other distinguished institutions of higher education. The concentration of highly skilled jobs in downtown Minneapolis is also likely having an effect on the level of educational attainment in the county.

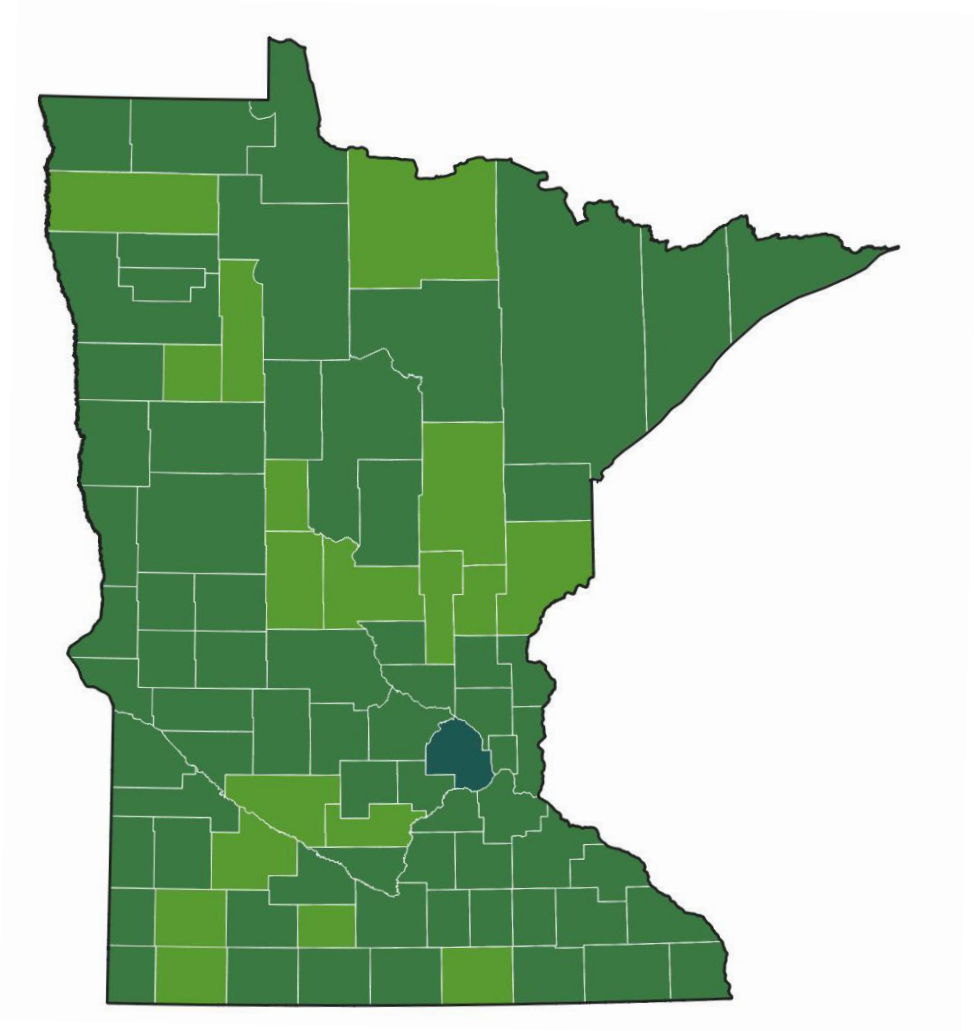

Figure 12: Median Level of Educational Attainment by County

DISTRIBUTION OF INCOME AND POVERTY IN THE STATE

Distribution of Income

When the distribution of income is viewed at the census tract level, there is great variation that can be seen across the state. The first thing that one can note is the highest incomes in the state tend to be in pockets that are in the seven-county Metro area. This holds true for most places with the exception of Rochester, where the Mayo Clinic is clearly affecting local incomes.

Another interesting observation is the income in rural towns tends to be slightly lower than surrounding areas. This can be seen by the slightly lighter shade of green that tends to highlight most of the state's smaller cities. The state's median household income, according to the 2021 5-year American Community Survey (ACS) was just $77,706, which is reflected across the majority of census tracts in the state.

The highest incomes in the state tend to be in pockets that are in the seven-county Metro area.

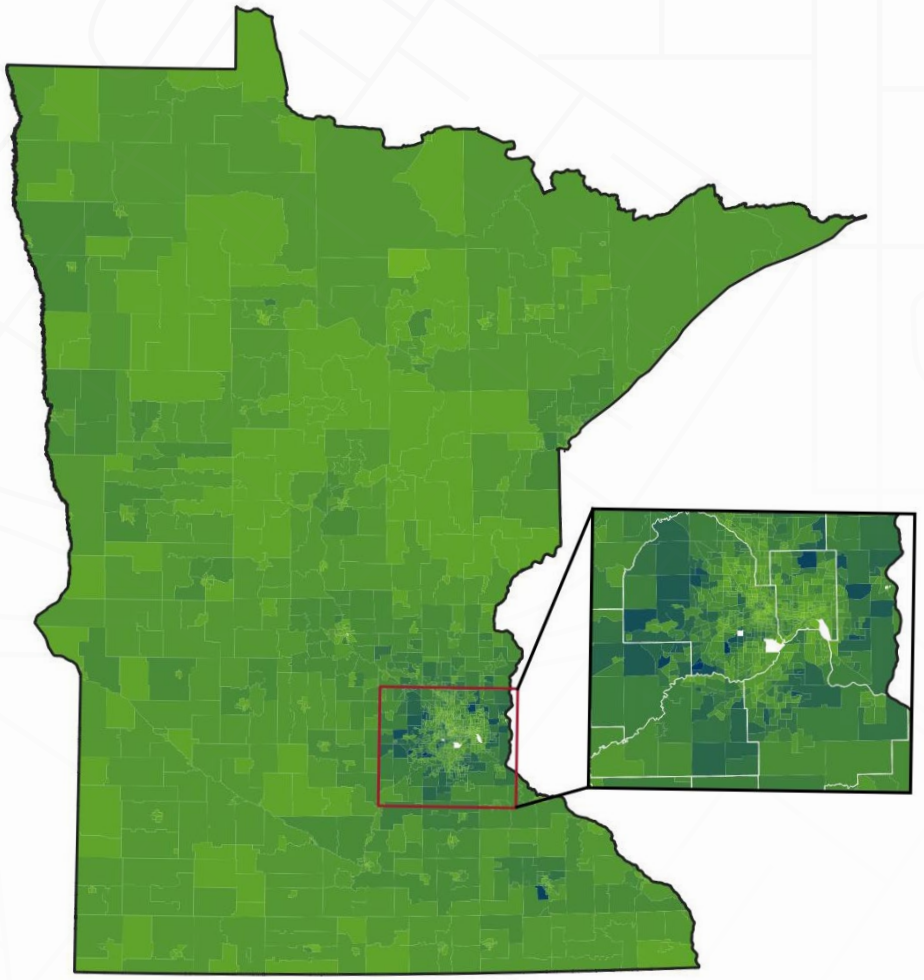

Figure 13: Median Household Income by Census Tract

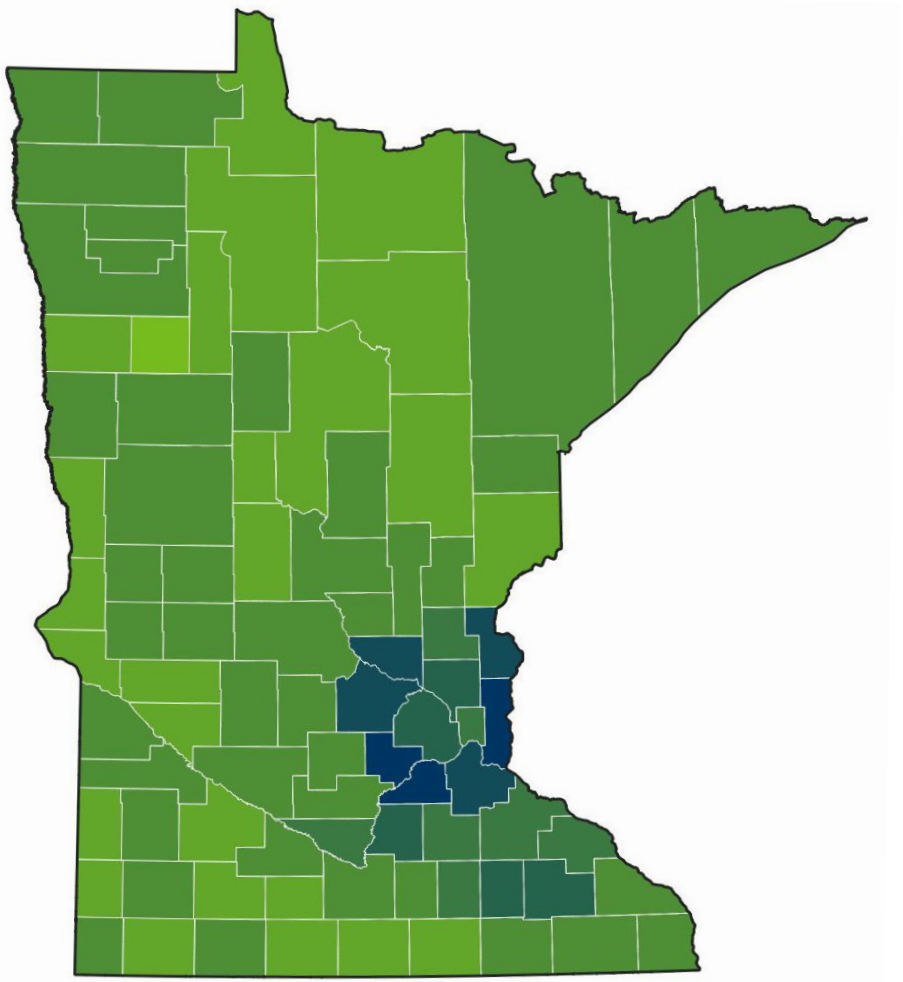

Figure 14: Median Household Income by County

When the level of analysis is changed to the county level, it becomes clear that higher incomes are present in the seven-county Metro area. While not universally higher in all of the seven counties of the Metro Area, they are clearly higher in and around the area than they are in Greater Minnesota where incomes hover closer to the state median. More similar to the Metro Area, incomes appear higher around Rochester as noted when tract data was under analysis.

Distribution of Poverty

The distribution of poverty in the state at the census tract level is broken up in to 20 percent bands, except for the last group that ends at 75 percent, the highest recorded poverty for a tract in the state. This is because of the understanding that an area that exceeded 20 percent poverty is considered an area of concentrated poverty. There is some debate in the literature on poverty as to the exact point between 20 and 40 percent that an area begins to exhibit the qualities of an area of concentrated poverty, however there is wide agreement that an area with a poverty rate of 40 percent or higher is experiencing a level of poverty that will extend beyond its bounds and begin to have significant effects on surrounding areas.

This view of poverty also shows some of the flaws in the way that we, as a nation, record and understand poverty. As an example, the highest tract level poverty seen in the state is on the East Bank of the University of Minnesota's campus. That rate 74.7 percent is very high but is more reflective of the definition of poverty not appropriately accounting for the different types of incomes and living situations of students. Traditional poverty measures the amount of cash income and does not include government or family assistance, transfer payments, or student financial aid. This creates a situation where it appears that a large majority of poverty exists among the student body. To be sure, there is poverty among students, but they are also not the neediest, from a poverty perspective.

These data also reveal that poverty is not an urban problem. This is shown by the areas in Greater Minnesota that have poverty that exceeded 20 percent. This is a very high level of poverty that, as mentioned above, can begin to extend effects beyond the bounds of the particular geographic area.

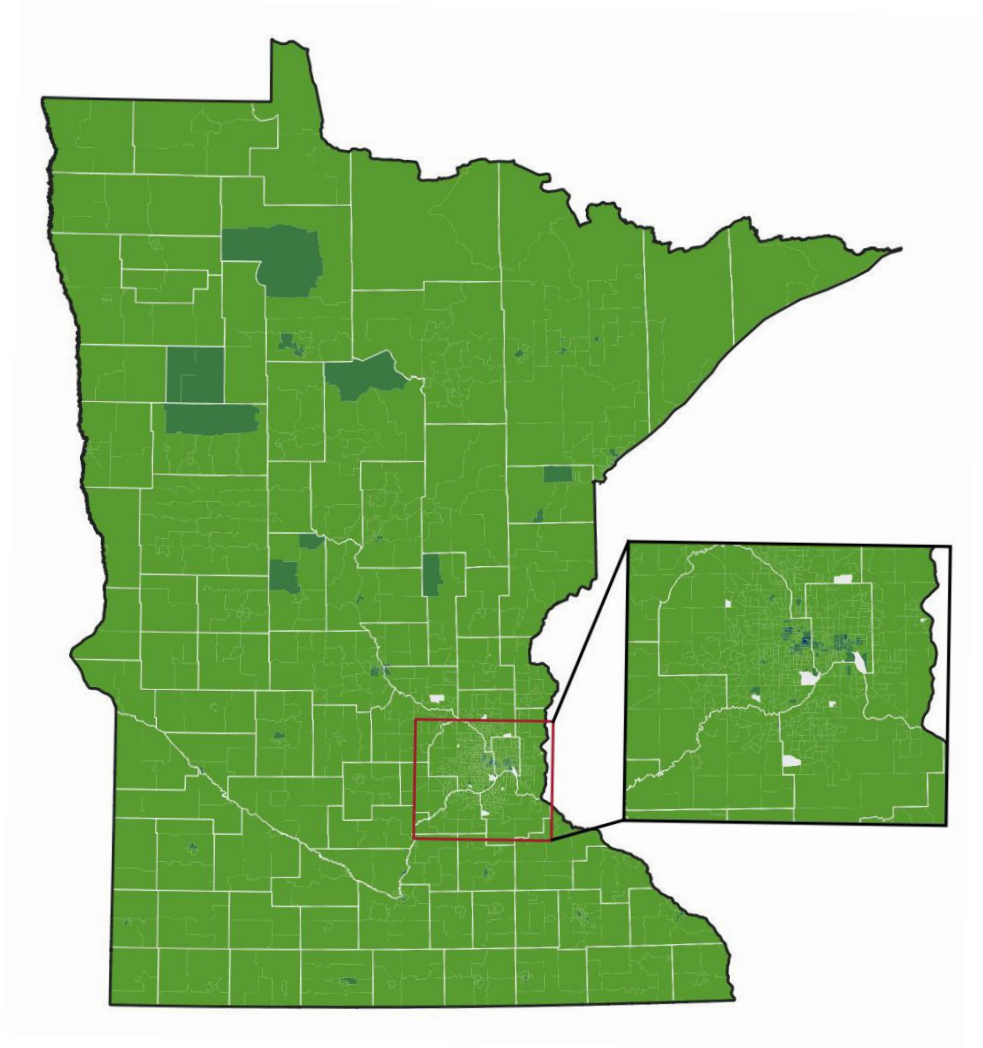

Figure 15: Percent in Poverty by Census Tract

When we shift focus to county level poverty, we can see the mollification of poverty as most counties drop to a relatively lower level of poverty than what was seen on the tract map. An exception to this is Mahnomen County that still has a poverty rate over 20 percent, which is troublingly high for a county. Mahnomen county exists entirely within the boundaries of the White Earth Reservation, so it is more than a story of high poverty, there are also racial and historical considerations that have to be taken into account when reviewing county level poverty.

Beltrami and Blue Earth Counties also have relatively high levels of poverty, both in excess of 16 percent. Both counties have something in common with the tracts around the University of Minnesota, however. That is a large and disproportionate share of college students. That is not to say there is not poverty among Blue Earth and Beltrami County residents who are not college students. Data from the American Community Survey suggest, for residents who are not in school, the poverty rate in Blue Earth County is somewhat higher, at 10 percent, than the state's overall eight percent. The rate of poverty among non-students in Beltrami County is considerably higher than the state average at 13 percent.

Racial and historical considerations have to be taken into account when reviewing county level poverty.

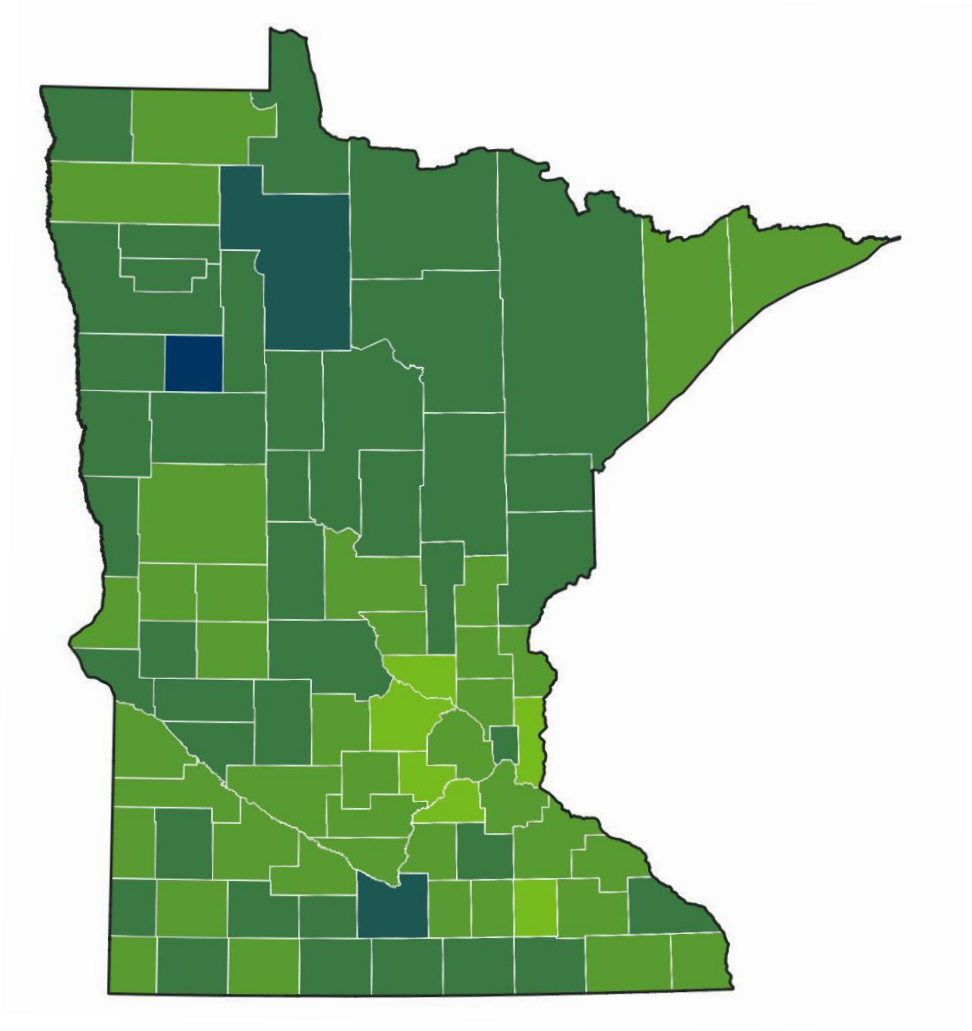

Figure 16: Percent in Poverty by County

LEARNING FROM DISTRIBUTIONS

There is much that can be learned from reviewing the distributions of data in an area and the state. Many of the decisions and events that have shaped Minnesota can be seen in the settlement patterns as well as the distributions of characteristics of the population across the state. There is great value in reviewing both the geographic distributions of characteristics and in the overall distribution of characteristics, like age and sex, within the total population.

REFERENCES

Figure	Data Source	Source Link	Derived/Published
1	2020 Decennial Census	https://data.census.gov/table/ACSST5Y2021.S0101?g=040XX00US27$1400000	Published
2–7		https://data.census.gov/table/DECENNIALPL2020.P2?g=040XX00US27$1000000	Published
8	2021 Population Estimates	Data not publicly available	Not Applicable
9	2021 American Community Survey 5-year Estimates	https://data.census.gov/table/ACSST5Y2021.S0101?g=040XX00US27$1400000	Published
10		https://data.census.gov/table/ACSST5Y2021.S0101?g=040XX00US27$0500000	Published
11		https://data.census.gov/table/ACSST5Y2021.S1501?g=040XX00US27$1400000	Derived
12		https://data.census.gov/table/ACSST5Y2021.S1501?g=040XX00US27$0500000	Derived
13		https://data.census.gov/table/ACSST5Y2021.S1901?g=040XX00US27$1400000	Published
14		https://data.census.gov/table/ACSST1Y2022.S1901?g=040XX00US27$0500000	Published
15		https://data.census.gov/table/ACSST5Y2021.S1701?g=040XX00US27$1400000	Published
16		https://data.census.gov/table/ACSST5Y2021.S1701?g=040XX00US27$0500000	Published

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