

A GIS and Statistical Assessment of Welfare Population Characteristics in Ramsey County

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Keywords: Minnesota Family Investment Plan (MFIP), Welfare Reform, welfare to work transition, Ramsey County, Saint Paul Planning District, Dayton's Bluff Planning District, Demographic studies, Population characteristics, Geographic Information Systems (GIS).

Abstract

The characteristics and patterns of the Minnesota Family Investment Plan in Ramsey County municipalities and planning districts from December 1999 to February 2000 were analyzed by using statistical and geographical analysis methods. Population characteristics such as age, education, race-ethnicity, and family size were examined. The goal of this project was to identify MFIP patterns and give a holistic picture of MFIP. This will assist policy makers in implementing and improving various social and environmental issues as well as implement programs to conduct population transition from welfare to work in Ramsey County municipalities and planning districts.

Introduction

Discussion of MFIP

In 1996, the U.S Federal Government passed new welfare reform legislation (TANF or Temporary Aid to Needy Families) that gave birth to the Minnesota Family Investment Plan in 1997. Under the new federal legislation, a person can only receive up to 60 months of public assistance in her/his lifetime (Minnesota Department of Human Services, 2000). This presents a great challenge for low-income families who must make a transition from welfare to work in five years or less. MFIP strongly emphasizes employment and work related activities to reduce the number of welfare recipients in the State of Minnesota. OPME supplied the characteristics and needs of families at the beginning of MFIP (Ramsey County office of Performance, Measurement and Evaluation, 1999). The GIS and Statistical Assessment of Welfare Population Characteristics in Ramsey County updated that information by re-examining population characteristics such as

age, ethnicity and family size at the beginning of 2000.

Ramsey County consists of the city of Saint Paul and 17 suburban municipalities. Within the city of Saint Paul, there are 17 neighborhood planning districts (Figure 1). The Census 2000 estimates the population of Ramsey County to be 511,033.

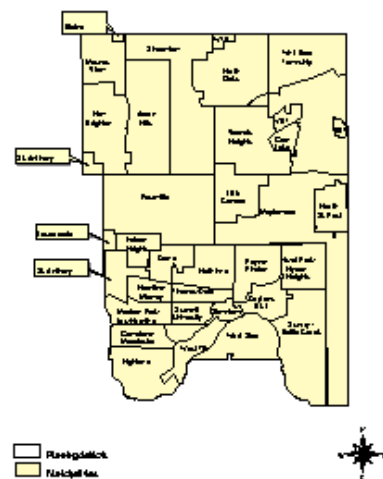


Figure 1. Ramsey County Municipalities and Planning Districts.

Background Information

Overview of MFIP

Many Minnesota welfare recipients have moved off MFIP relatively quickly, while others have made little progress (Office of the Legislative Auditor, 2000). The overall MFIP caseload in Ramsey County has decreased significantly since July 1st, 1997, the beginning of MFIP (Figure 2).

AFDC/MFIP Cases			
Year	1994	1998	1999
Number of Cases	11,800	9,300	8,700

Figure 2. Number of AFDC/MFIP cases in Ramsey County.

The percentage of MFIP caseheads of the age group 20 - 35 decreased from 68.8 percent to 62.4 during the four-year period 1995 to 1999 (Figure 3). Adults aged 20 - 35 are more likely to find jobs and make the transition from welfare to work. The proportion of adults aged 51 - 65 and teenagers aged 15 - 19 have increased by approximately 2.5 percent from the baseline example (Figure 3).

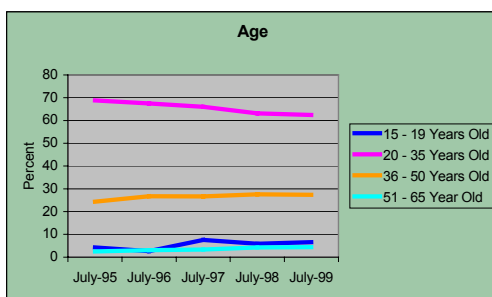


Figure 3. Age of MFIP caseheads in Ramsey County.

The number of caseheads who have some formal education, such as high school diploma/GED or some college background, have decreased during the four-year time period. The proportion of MFIP caseheads having no formal education or no education

beyond 9th to 11th grade has slightly increased (Figure 4).

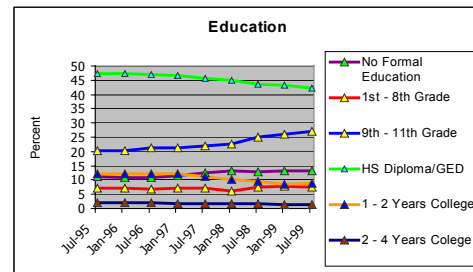


Figure 4. Highest level of education MFIP caseheads achieved

Even though the overall MFIP caseload has decreased from July 1995 to July 1999, the proportional representation of various race-ethnic groups has not remained the same. The percentage of Asian American, Hispanics and Native-Americans have each increased by less than one percent. The ratio of MFIP caseheads identified as Caucasian has significantly decreased by 10 percent during this four year period of time. However, the proportion of MFIP caseheads with an African-American background increased by 9.2 percent (Figure 5).

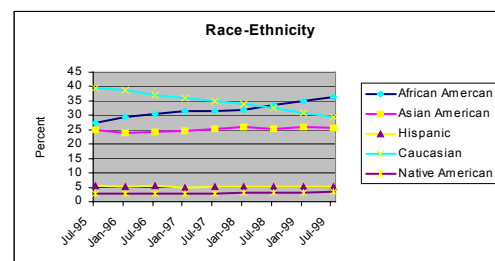


Figure 5. Race-Ethnicity of MFIP caseheads in Ramsey County.

The number and characteristics of MFIP cases during December 1999, January and February of 2000 varies significantly between different geographical regions within Ramsey County. Even though Saint Paul has a higher MFIP case density than suburban municipalities, Saint Paul's MFIP case density varies significantly across its planning districts. Outside Saint Paul, the city of Maplewood is the second highest in

total MFIP cases with 2.2 percent. The city of New Brighton is third with 1.4 percent. The city of Moundsview is fourth with 1.2 percent. The remaining suburban municipalities account for less than three percent of the total MFIP cases (Figure 6).

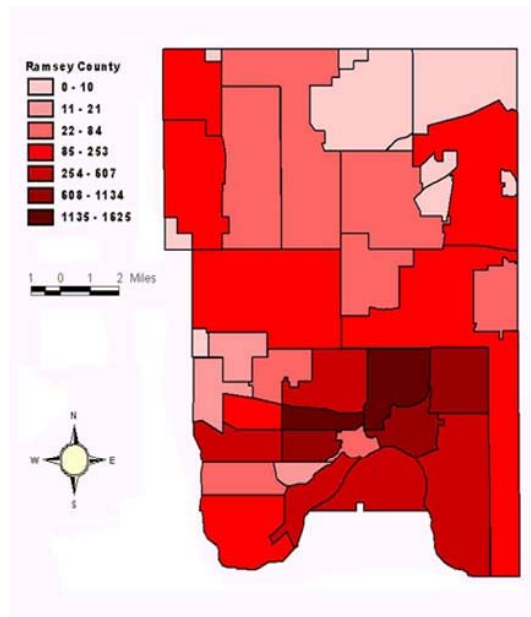


Figure 6. MFIP Cases in Ramsey County.

Data Acquisition and Manipulation

The Department of Human Services (DHS) data tracks families' experiences with financial, medical and food assistance programs (Department of Human Services, 2000). The Department of Economic Security (DES) data provides information regarding a participant's experience in employment services (Department of Economic Security, 2000). The data provide a picture of the families on MFIP in Ramsey County. The data were structured to fit to the parameters of this study. The data were reclassified to include three months of data from December 1999 to February 2000. The data were organized by geographical areas, then further analyzed by population characteristics. Selected population characteristics included race-ethnicity, age, MFIP case type, education, number of

months on assistance and number of children on MFIP. This cross-sectional study provided a holistic picture of MFIP patterns and characteristics.

In December 1999, there were 10,405 MFIP caseheads (parents and/or caretakers). In January 2000, the number of caseheads decreased to 10,193 and in February 2000, the number of MFIP caseheads decreased to 9,873. During this three-month period, a total of 11,275 unique MFIP caseheads occurred in Ramsey County. For example, in a family with four people on MFIP, only the head of the case would be counted. The number of the cases is higher because this data tracks all the adults open (active case holders) during this period of time. The result was an unduplicated database saved as .dbf format and later imported to ArcView.

Methodology

The data under this study needed to be aggregated to maintain client confidentiality. The data include many personal traits or characteristics, which are key factors in determining the characteristics of MFIP cases in Ramsey County (Ramsey County Human Services, 2000). However, using this confidential data and at the same time aggregating data without compromising accuracy was a great challenge.

This project is developed using various software application packages such as SPSS 9.0 produced by SPSS Inc.; Microsoft Access 9.0 produced by Microsoft; and ArcView 3.2a produced by Environmental System Research Institute Inc. (ESRI). There were five different extensions/scripts used throughout this project: *Add X, Y and Z Coord* by Yuan Ming Hsu, *Count Points in Polygons* by Yingming Zhou, *Spatial Analyst* by ESRI, *Hot Spot Analyst* by United States Department of Justice, and *Disperse Point Script* by Robert Mangold.

The data were converted to SPSS 9.0 in order to complete the needed steps before it could be imported to ArcView. In SPSS the data were matched with other Department of Human Services data to check the accuracy and complete missing information. In ArcView the MFIP caseheads were geocoded using the Ramsey County boundary coverage and parcel coverage. There were a total of 12,275 MFIP cases in Ramsey County during the three month period of time. About 5.6 percent of the MFIP cases, 687 records, were unable to be mapped due to insufficient address information or due to residency outside of the Ramsey County mapping boundaries. Cases with insufficient addresses included, for example, general delivery, or motel address etc. The geocoded MFIP points were grouped and extracted by municipalities and planning districts in order to further analyze the data. These points produced a coverage that could be visually displayed along with Ramsey County congressional and district coverages.

The first extension used was *Add X, Y and Z Coord*. This extension simply added X and Y coordinates in reference to the geocoded points, which allowed all addresses associated with clients to be removed. The *X and Y Coord* provided a method of protection for MFIP clients by removing addresses from personal data. By using the query builder function in MS Access the data could be subset to specific population characteristics.

The geocoded MFIP case points could be presented by using coverages in planning districts or municipality levels; however, in some municipalities the number of cases were fewer than others. Therefore, these points either had to be joined with other municipalities or converted to polygon coverages to protect data confidentiality. The *Count Points to Polygons* extension converts points to polygons by counting the number of points in each polygon to its spatial distribution. The newly created

polygon coverage show the MFIP cases in three levels of measurement: low, medium, and high.

The *Spatial Analyst* Extension was one of the extensions used to show MFIP case density. This extension counted the number of MFIP cases in relation to spatial distribution and created the density analysis. In turn this extension converted the points to a grid to show the density of MFIP cases. The *Spatial Analyst* Extension was used to determine the density levels of MFIP cases in Ramsey County. The MFIP case density was relatively higher in the city of Saint Paul, in which the majority of the highly dense areas resided in the planning districts that are located to the east of Saint Paul. There were five major high density areas/hot spots calculated with the *Spatial Analyst* Extension. Three of them resided in the East Side of the City of Saint Paul. The Ramsey County suburban municipalities had the lowest case density compared to the total number of MFIP cases.

The *Hot Spot Analyst* Extension also showed MFIP case density; however, this could be shown with different tolerance levels. The tolerance levels ranged from zero to one hundred and could be set to determine the degree of improvement in given neighborhoods. The *Hot Spot Analyst* Extension determined specific areas with different tolerance levels. When the tolerance level is identified in a given location, a particular community implementation/development action can be taken. This is a method of measuring the progress of MFIP in Ramsey County municipalities and neighborhood planning districts.

The *Disperse Point* Script calculates the multiple incidents at a given point, which helps identify to population dense areas. By examining why the MFIP population densities exist in these predictable areas, other environmental factors such as high density housing, which resulted multiple cases at a single

address/location, or multiple number of addresses in proximity to each other, were addressed.

The final stage of this analysis was a statistical study of the MFIP patterns and characteristics, which were processed using Microsoft Access 9.0 and SPSS 9.0. Demographic characteristics were calculated and analyzed to a correlation of the spatial analysis and social factors of this study.

Analysis/Results

The GIS and Statistical Assessment of Welfare Population Characteristics in Ramsey County provides general analysis of MFIP in Ramsey County Municipalities and in the City of Saint Paul. Further, Dayton's Bluff planning district is, a planning districts, that has the highest number of MFIP cases. The characteristics of MFIP cases in Dayton's Bluff planning district are examined to address the MFIP cases in a planning district level. This narrows the project's focus from a general or county level, to more specific or district level.

The number of families on AFDC/MFIP has decreased since 1995. Since the new welfare reform legislation the number of families on public assistance has decreased. This is because the MFIP legislation expects recipients to find employment as soon as possible. Unemployed recipients are required to participate in job search activities, which has led to and increased in the employment of welfare recipients. Other educational supports such as completing GED and/or low and soft "life skills" are also provided. The data suggested various characteristics of MFIP by looking at the demographic elements such as age, race-ethnicity, family size, MFIP case type, education, and number of months on assistance. During the three months of this period, there were a total of 11,275 cases, 10,645 of which were geocoded (Figure 7).

The range of MFIP cases varied greatly between Ramsey County urban municipalities and the planning district, which make up the city of Saint Paul. In the Ramsey County municipalities, the MFIP case density was low with some degree of variation. The Saint Paul planning districts, as a whole, accounts for 83 percent of all MFIP cases in Ramsey County.

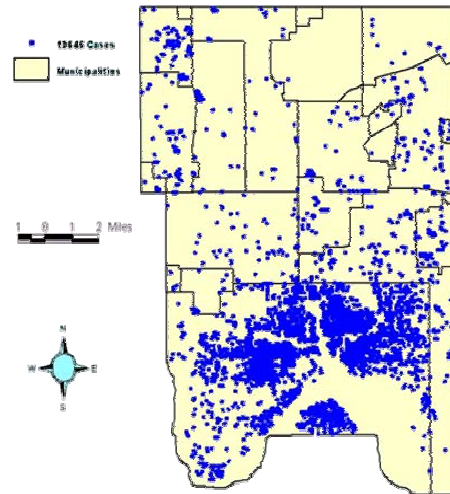


Figure 7. MFIP Cases in Ramsey County.

MFIP case density was concentrated in the northeastern Saint Paul neighborhoods. The *Spatial Analyst* Extension identifies the planning districts that are closest to downtown Saint Paul, particularly to the east and west of downtown, that have the highest number of MFIP cases. The closer the location is to downtown, the higher the number of MFIP cases the location contains. (Figure 8).

The MFIP case density was also calculated in a smaller scale in Dayton's Bluff neighborhoods using the Ramsey County Parcel coverage and *Spatial Analyst* Extension. The MFIP case density was analyzed more specifically by parcels in Dayton's Bluff neighborhoods. The distribution of MFIP cases was higher in north Dayton's Bluff (upper and lower bluffs). There was a correlation between older houses and/or residential areas and

number of MFIP cases in Dayton's Bluff neighborhoods. The data suggested environmental factors such as housing could strongly affect the distribution of MFIP in Dayton's Bluff neighborhoods (figure 9).

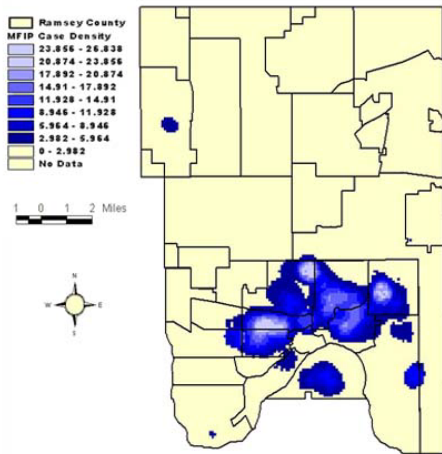


Figure 8. MFIP Case density in Ramsey County.

The *Hot Spot Analyst* is another extension which calculates hotspot areas by specifying different tolerance levels ranging from zero to hundred. The higher the tolerance level, the smaller an area becomes. This method of analysis was used in Dayton's Bluff planning district. The Hot Spot Extension was used to identify areas with high MFIP case distributions or hotspots. A specific goal could be set up

in a given locations to determine the degree of improvement in areas that are recognized as MFIP hotspots. Resource could be allocated to those hotspots by determining various tolerance levels. The *Hot Spot Extension* suggested many areas that need immediate attention by policy makers, community developers, and community organizers. For confidentiality purposes these areas cannot be specified, but some of them are shown below (figure 10).

Here, the MFIP density and hotspots were calculated to show the distribution of MFIP cases in Ramsey County, the City of Saint Paul and Dayton's Bluff neighborhoods. Many sociological and environmental factors could have affected the results of this analysis.

The next step of this study was to look at the demographic characteristics of MFIP by using statistical and geographical calculation methods. There were six variables studied to complete the analysis: age, race-ethnicity, family size, education, MFIP case type, and number of months on public assistance (TANF and MFIP). Each variable will be examined separately to demonstrate what roll the variable played in the analysis.

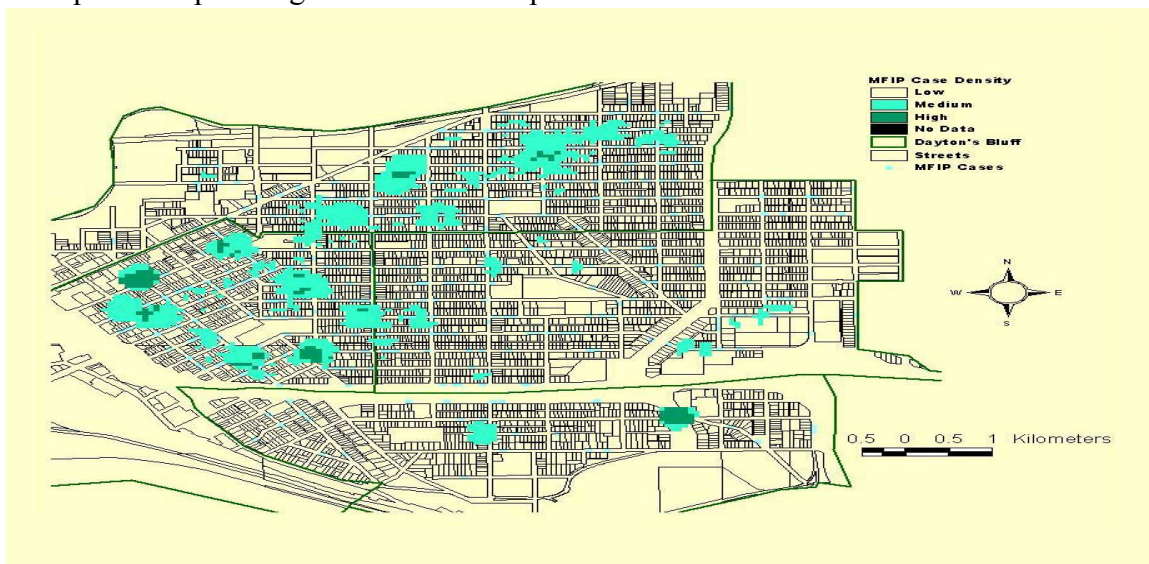


Figure 9. MFIP case density in Dayton's Bluff neighborhoods.

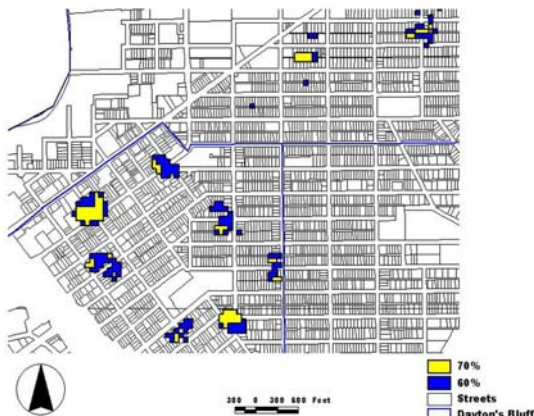


Figure 10. MFIP hot spots at 60 and 70 percent tolerance level in Dayton's Bluff neighborhoods.

Age

The age of MFIP caseheads varies from early teens to older adults. The highest numbers of MFIP cases were found in the 20 –25 year old age group, which accounted for 54.8 percent of all caseheads in Ramsey County (Figure 11).

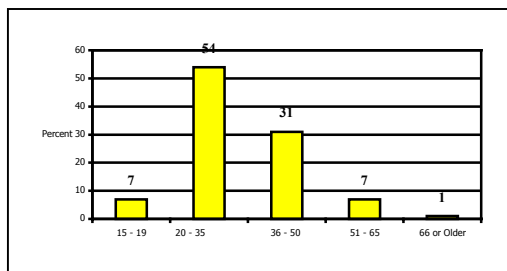


Figure 11. Age of MFIP cases in Ramsey County.

The age distribution of MFIP caseheads in the City of Saint Paul and Dayton's Bluff planning district is essentially the same as in Ramsey County as a whole. Here 20 - 35 year olds account for 54 percent of all MFIP cases in the in Dayton's Bluff planning district (Figure 12).

The number of MFIP cases among elderly, 66 years or older is significantly low in Ramsey County as well as in Dayton's Bluff Planning District.

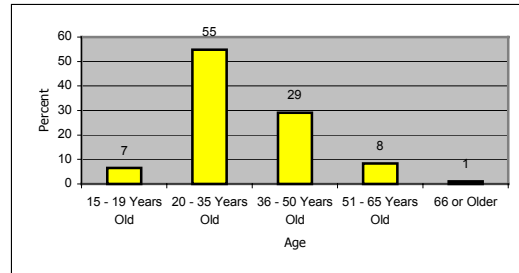


Figure 12. Age of MFIP caseheads in Dayton's Bluff Planning District.

Race-ethnicity

The second demographic variable studied was race-ethnicity of MFIP caseheads. The race or ethnic identity of the MFIP cases included in this study was based on the race/ethnicity of the casehead. This categorization is self-selected by the casehead, but it may not adequately capture the diversity of biracial individuals or multi-ethnic families.

According to Census 2000 estimates, the population of Ramsey County is 511, 033. The population of Ramsey County is divided into different race-ethnic groups that represent 77.3 percent are Caucasian; 7.6 percent are African American; 8.2 percent are Native American; 8.7 percent are Asian American and 0.82 percent are Native Hawaiian; 5.3 percent are Hispanic and 0.06 percent are Other Pacific Islander.

Out of 38,900 African Americans in Ramsey County, 11.0 percent are on MFIP, which represents 34.4 percent of the total MFIP cases found in Ramsey County. Out of 44,836 Asian Americans, 8.7 percent are on MFIP, which represents 7.9 percent of the total MFIP cases in Ramsey County. Out of 395,406 Caucasians 0.8 percent are on MFIP,

which represents 26 percent of the total MFIP cases in Ramsey County. Out of 4,221 Native Americans, 8.7 are on MFIP, which represents 3 percent of the total MFIP cases in Ramsey County. Out of 27,349 Hispanics, 3.1 percent are on MFIP, which represents 7 percent of all MFIP cases in Ramsey County.

African American caseheads constitute the highest percentage of total MFIP cases, (34.4 percent) and the Asian American second highest, (29 percent) of total MFIP cases, this is not representative of Ramsey County as a whole. These percentages are high because the MFIP proportion within their race-ethnicity is high in the small representation of the population in Ramsey County as a whole (Figure 13-16).

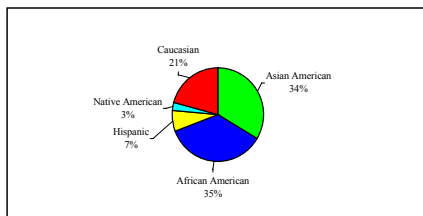


Figure 13. Race-ethnicity of MFIP caseheads in Ramsey County.

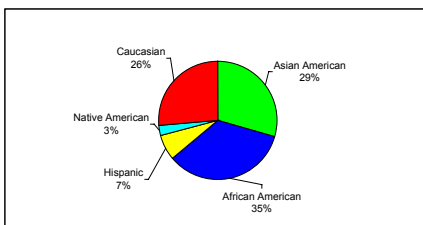


Figure 14. Race-ethnicity of MFIP Caseheads in Saint Paul Planning Districts.

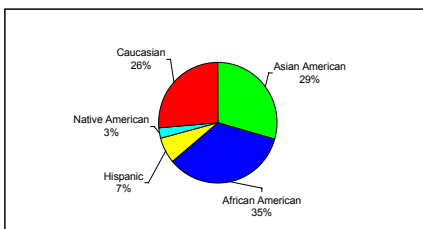


Figure 15. Race-ethnicity of MFIP in Dayton's Bluff Planning district.

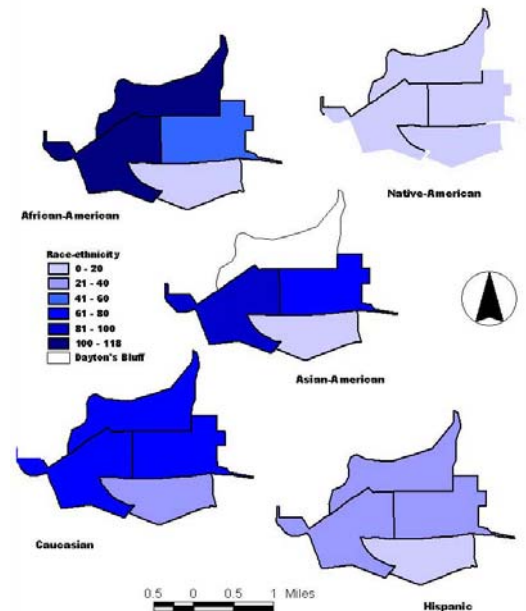


Figure 16. Race-ethnicity of MFIP caseheads in Dayton's Bluff neighborhoods.

Number of Children on MFIP

The third demographic variable studied was number of children on MFIP. When the age and race-ethnicity of MFIP cases were examined, it was interesting to further study the family size of MFIP casheads. The number of children of MFIP families ranged from one to thirteen. Most families, 61 percent of MFIP caseheads in Ramsey County, have two or fewer children. The number of children in the Saint Paul planning districts was almost the same as Ramsey County as a whole. Dayton's Bluff had a lower percentage of one child and two children families compared to Ramsey County and the city of Saint Paul. There was a correlation between cases with Asian American caseheads and a larger average family size. Cases listed as "no children" are eligible for MFIP because of a current

pregnancy or are cases without a casehead present (Figure 17-20).

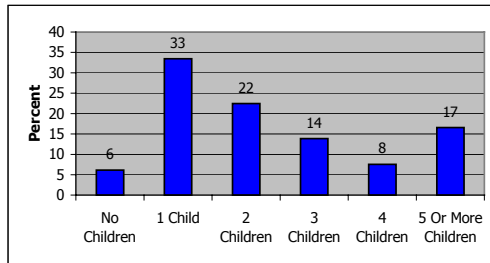


Figure 17. Number of Children on MFIP cases in Ramsey County.

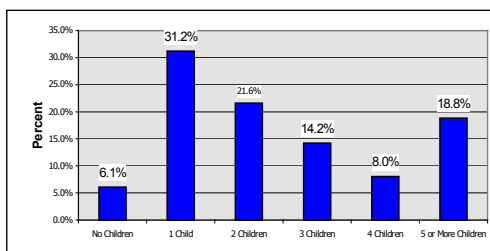


Figure 18. Number of Children on MFIP cases in Saint Paul Planning Districts.

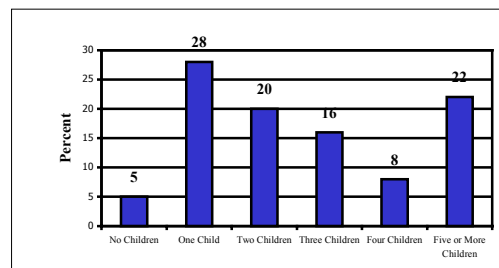


Figure 19. Number of Children on MFIP in Dayton's Bluff Planning District.

The number of children in Dayton's Bluff varies within the neighborhoods and ranges greatly between -upper, middle, and lower east neighborhoods (Figure 20).

Education

The fourth demographic variable researched in depth was the education of MFIP cases. This was done to examine if

there was a significant correlation between the education levels achieved and the number of children. About 56 percent have less than a HSD/GED diploma and 37 percent had a HSD/GED.

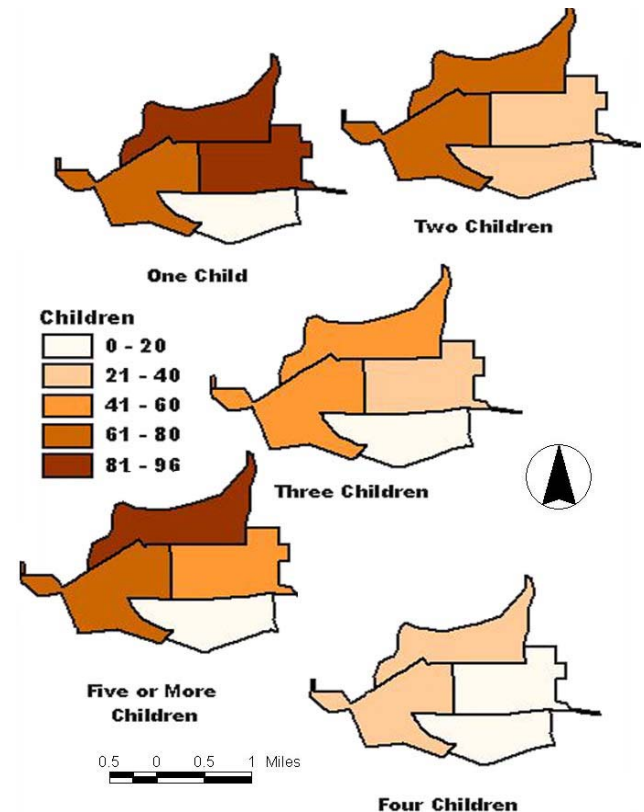


Figure 20. Number of Children on MFIP in Dayton's neighborhoods.

The caseheads who have completed high school/GED represent a higher percentage of caseheads with fewer children. There is a significant difference in the average number of children per family when the casehead has no formal education versus when the casehead has completed up to or between three to four years of college (figure 21).

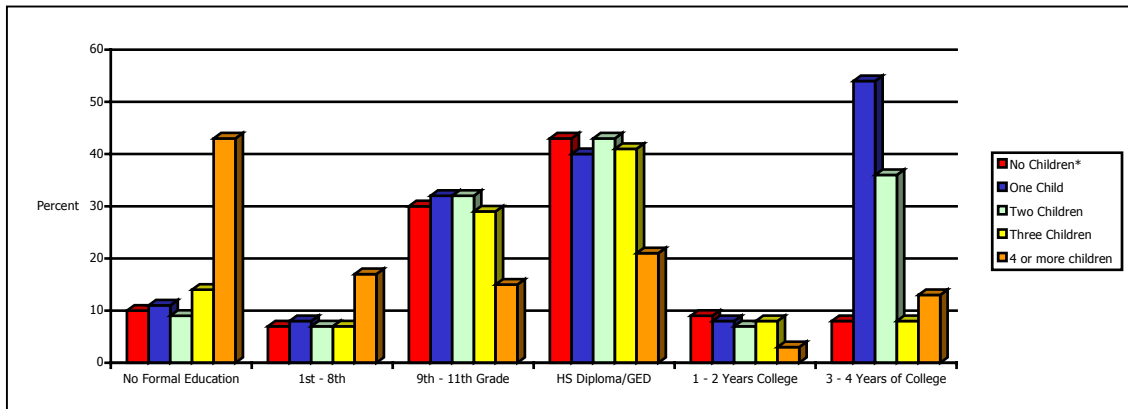


Figure 21. Education and Number of Children of MFIP caseheads in Ramsey County.

The higher the level of education associated with the casehead the lower the average number of children a casehead has and vice versa. Caseheads with no formal education make up the highest percentage of parents with five or more children, whereas caseheads with three to four years of college have the highest percentage of families with only one child (Figure 22).

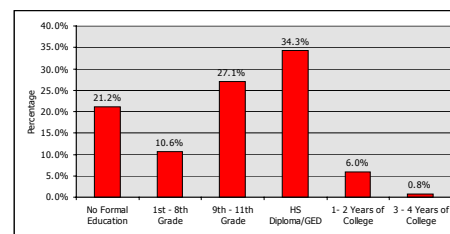


Figure 23. Education of MFIP caseheads in Saint Paul Planning districts.

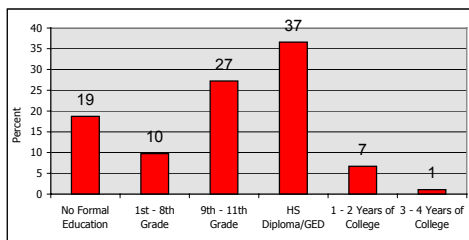


Figure 22. Education of MFIP cases in Ramsey County.

The highest percentage, 34.3 percent of cases in the Saint Paul planning districts, are those with a casehead who completed high school. These make up 34.3 percent of all cases. Caseheads where there has been no formal education make up 21.2 percent of the MFIP cases in Saint Paul. This is generally due to immigration status, language barriers or other factors (Figure 23).

Dayton's Bluff planning district has the highest percentage compared to Ramsey County and the city of Saint Paul as a whole with 30 percent of MFIP caseheads who completed 9th – 11th grade (Figure 24).

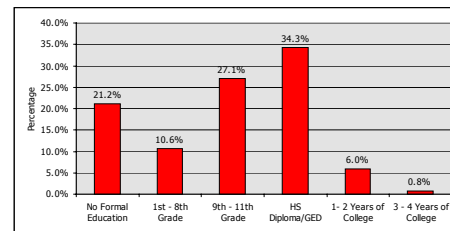


Figure 24. Education of MFIP casheads in Dayton's Bluff Planning District.

The distribution of caseheads with 9th – 11th grade educational background is higher in the upper and west lower Dayton's Bluff neighborhoods (Figure 25).

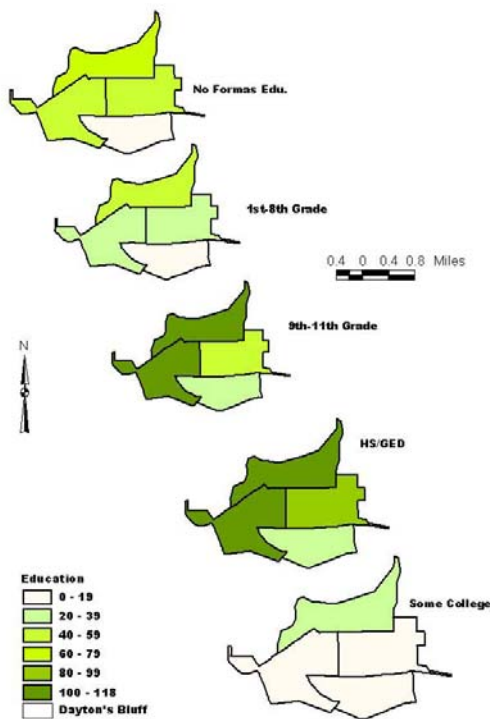


Figure 25. Education of MFIP caseheads in Dayton's Bluff neighborhoods.

MFIP Case Type

The fifth demographic factor studied was the MFIP case types, which included single parent, two parent, caretaker (adult is not the parent) or "child only" (the parent is not included the MFIP grant). A caretaker is usually an adult such as an aunt or grandparent, or another person other than the child's biological parent, who has legal custody of the child. The "child only" cases are where the parent or caretaker of the child is not eligible for MFIP due to citizenship, disability program or other reasons. MFIP Case Types were also studied to address the patterns of the case types in relation to various race-ethnicity populations. The MFIP "case type", which refers to the number of parents present, also varies with the different race-ethnicity groups. For Asian American caseheads, two parent cases make up 50 percent of all cases and "caretaker cases" about 36 percent. For the African American families on MFIP cases,

the child only case type represents 50 percent and single parent case type 40 percent. For Caucasian caseheads, single parent case type represents 29 percent and two parent case type 22 percent. Ramsey County had 65 percent single parent case type; 17 percent caretaker; and 18 percent two parent homes during the three month period of this study (Figure 26).

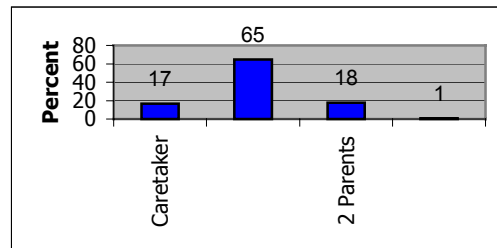


Figure 26. MFIP Case Type in Ramsey County.

The majority of MFIP families, 62 percent, represents single parent homes in Saint Paul. (Figure 27).

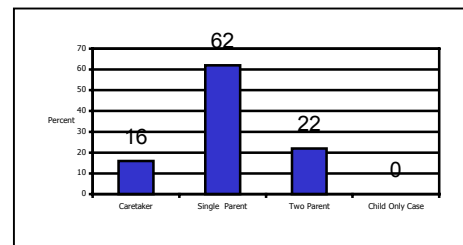


Figure 27. MFIP Case Type in the Saint Paul Planning Districts.

The percentage of two parent homes in Dayton's Bluff is higher at 22 percent compared to Ramsey County and Saint Paul Planning District at 18 and 18.5 percents.

The distribution of single parent homes in the middle bluff is higher, whereas the proportion of caretaker cases is low and fairly distributed overly throughout Dayton's Bluff (Figure 28).

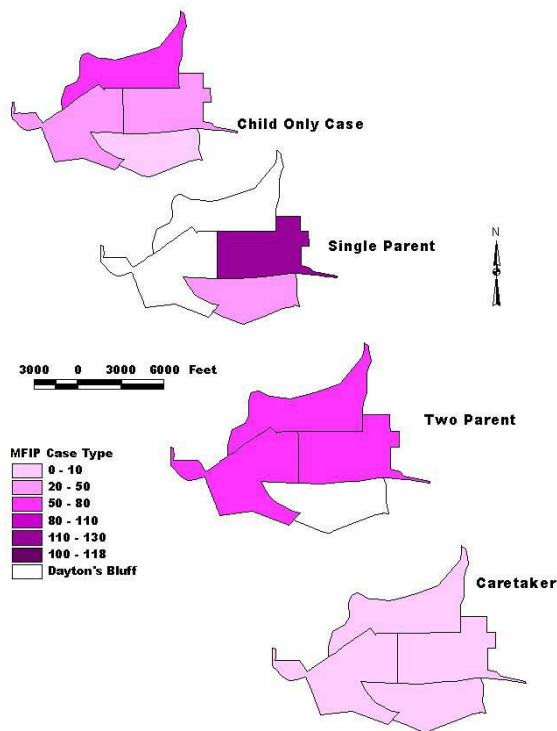


Figure 28. MFIP Case Type in Dayton's Bluff planning district.

Months on Assistance (TANF & MFIP)

The final demographic factor studied was number of months on public assistance including TANF and MFIP. Under federal TANF restrictions, caseheads are only allowed to receive 60 months of support. In Minnesota, the "MFIP clock" began on July 1, 1997. As of March 1, 2000 cases that began on MFIP and received continuous benefits would have expended 32 months of their total eligibility.

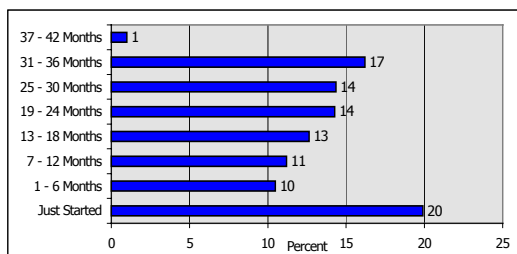


Figure 29. Total Number of Months on Assistance in Ramsey County (includes TANF and MFIP).

Some cases, such as those transferring from other states, many have expended more than 32 months depending on the date they started receiving TANF in their original state. Less than 1 percent of all cases have received MFIP for 37 to 42 months. Another 79 percent have received MFIP to some extent between a month to 36 months (Figure 29).

Discussion and Issues of Errors

This study provides only general analysis of MFIP cases in Ramsey County by examining various population characteristics such as age, number of children on MFIP, education, race-ethnicity, MFIP case type and number of months on assistance. Other factors that could have a great effect in determining the characteristics of MFIP, such as the different public assistant programs that are provided for MFIP recipients and their effectiveness as well as general training of life skills, education training and job success, could be major factors in determining the patterns of MFIP. However, this study focuses only on examining the population characteristics of MFIP clients rather than evaluating the effectiveness of various provided programs. Data privacy and confidentiality is another important factor that had to be considered throughout this study. For this purpose, results that could violate the Data Privacy Act were presented in aggregate form methods to protect client confidentiality. Street names are not listed throughout the study.

Conclusion

The use of GIS mapping techniques helps to identify various sociological and environmental issues. Through the sociological perspective, the analysis of MFIP cases and demographic study in Ramsey county give a visual and statistical perspective of MFIP cases and

many other factors that can have a great effect in reducing MFIP cases in Ramsey County. East Saint Paul has the highest number of MFIP caseheads in Ramsey County. The data suggested that there is a definite need for education programs for MFIP caseheads. Those who have been able to make the transition from welfare to work during these last three years are the caseheads who had HSD/GED or higher education. Therefore, it is important to provide MFIP caseheads with some higher education or practical training that could enable them to acquire an adequate job. More than half of the caseheads represent a single parent home. This represents a great challenge for low income families to become self-sufficient. By providing social programs that meet the needs of single parent homes such as daycare, single parent MFIP cases could be reduced. A large proportion of MFIP caseheads, African American and Asian American caseheads, reside in upper and lower Bluff neighborhoods. Also, caseheads who have no formal education and mostly immigrant population and are found in these neighborhoods. The data suggested that programs culturally sensitive for minority groups such as ESL for adults need to be promoted in upper and lower Bluff neighborhoods.

The distribution of MFIP cases throughout Ramsey County and the City of Saint Paul is diverse. The City of Saint Paul, especially the East Side, has the highest number of MFIP cases. By examining the different social perspectives such as family needs and environmental perspectives including housing aspects, this study could produce even more valuable suggestions.

Acknowledgements

I would like to thank my graduate committee members: Ms. Nicole Demotto, Mr. Dean Mierau, and Ms. Laurie

Hestness from Ramsey County Department of Human Services. Also, I would like to acknowledge the Ramsey County Human Service Department, Performance, Measurement and Evaluation Unit, not only for providing me with the MFIP data, but also for helping me creating the MFIP database. A special thanks goes to Melissa Barker from Ramsey County Human Services Department for taking time to edit and compile different databases together; without her help this project would not have been possible. I would like to thank Justin Niebuhr for his many insights throughout my project. Finally, I would like to acknowledge Saint Mary's University of Minnesota for use of its facilities.

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