

Final Report on the Health Analytics Pilot Program

SL 2016-94, Section 12A.17.(d)



Report to the

Joint Legislative Oversight Committee on Health and Human Services,

Joint Legislative Oversight Committee on Information Technology,

and

Fiscal Research Division

By

North Carolina Department of Health and Human Services

and

**Department of Information Technology, Government Data Analytics
Center (GDAC)**

May 31, 2017

Reporting Requirements

By May 31, 2017, the Department and GDAC shall make a final report of their findings and recommendations on the pilot program authorized by this section to the Joint Legislative Oversight Committee on Health and Human Services, the Joint Legislative Oversight Committee on Information Technology, and the Fiscal Research Division.

Background

2015 -2016 Fiscal Year

Session Law 2015-241, Section 12A1.17 directed DHHS to coordinate with the GDAC in the development and implementation of a pilot program for Medicaid claims analytics and population health management. Further, it directed the pilot to utilize the GDAC's existing public-private partnership to apply analytics to maximize healthcare savings and efficiencies to the State while improving health outcomes.

For the 2015-2016 fiscal year, seven hundred and fifty thousand dollars (\$750,000) of nonrecurring funds and two hundred and fifty thousand (\$250,000) of recurring funds were appropriated to support this effort. The effort and results of the work developed during the 2015-2016 fiscal year are referred to as the Medicaid Analytics Pilot (MAP 1.0).

MAP 1.0 demonstrated the value of enhancing Medicaid analytics through data visualization and interactive reporting to assist in better decision-making capabilities at NC DHHS; and that further development in Medicaid analytics was appropriate. DHHS recommended that potential value could be more quickly realized if further Medicaid data analytics development took place in the existing DHHS Medicaid analytical environment (NCAnalytics) rather than in a separate environment within the GDAC. This recommendation would streamline access to DHHS users allowing them to go to one site for information while also reducing the need to develop operate and maintain a second Medicaid analytics environment.

2016-2017 Fiscal Year

House Bill 1030 of 2016 rewrote Session Law 2015-241 and directed DHHS to coordinate with GDAC to expand the pilot to provide access to needed data sources, including Medicaid claims data, Medicaid beneficiary files, and local management entity/managed care organization (LME/MCO) encounter data for the pilot program. It called for the continued utilization of the existing public-private partnership to apply analytics in a manner that would maximize health care saving and efficiencies to the State and optimize positive impacts on health outcomes.

The rewritten session law also called for the expansion of the Health Analytics pilot to include:

1. The integration of new data sources such as patient level Healthcare Effectiveness Data and Information Set (HEDIS) measures, as prioritized by the DHHS and GDAC.
2. Customized reporting and analytics capabilities.
3. A tool to construct and analyze claims as clinical episodes of care to assist North Carolina in its transition to capitated managed care and value-based purchasing arrangements.

4. Operationalization of the pilot program, including an ongoing feed of the data and other data sources mutually agreed upon by DHHS and GDAC.

For the 2016-17 fiscal year, the session law was rewritten to appropriate the sum of two hundred and fifty thousand dollars (\$250,000) in recurring funds for each year of the 2015-17 fiscal biennium; and the sum of one million two hundred fifty thousand dollars (\$1,250,000) in non-recurring funds for the 2016-2017 fiscal year to support this effort.

HB1030, Section 12A.17(d), set forth the following timeline:

- January 15, 2016, submission of a progress report to the Senate and House appropriations Committees on Health and Human Services and the Fiscal Research Division.
- May 31, 2016, submission of an interim report of findings and recommendations to the Joint Legislative Oversight Committee on Health and Human Services, the Joint Legislative Oversight Committee on Information Technology, and the Fiscal Research Division.
- May 31, 2017, submission of a final report of findings and recommendations to the Joint Legislative Oversight Committee on Health and Human Services, the Joint Legislative Oversight Committee on Information Technology, and the Fiscal Research Division.

The effort and results of the work developed during the 2016-2017 fiscal year are referred to as the Health Analytics Pilot Program (MAP 2.0).

Health Analytics Pilot Program (MAP 2.0)

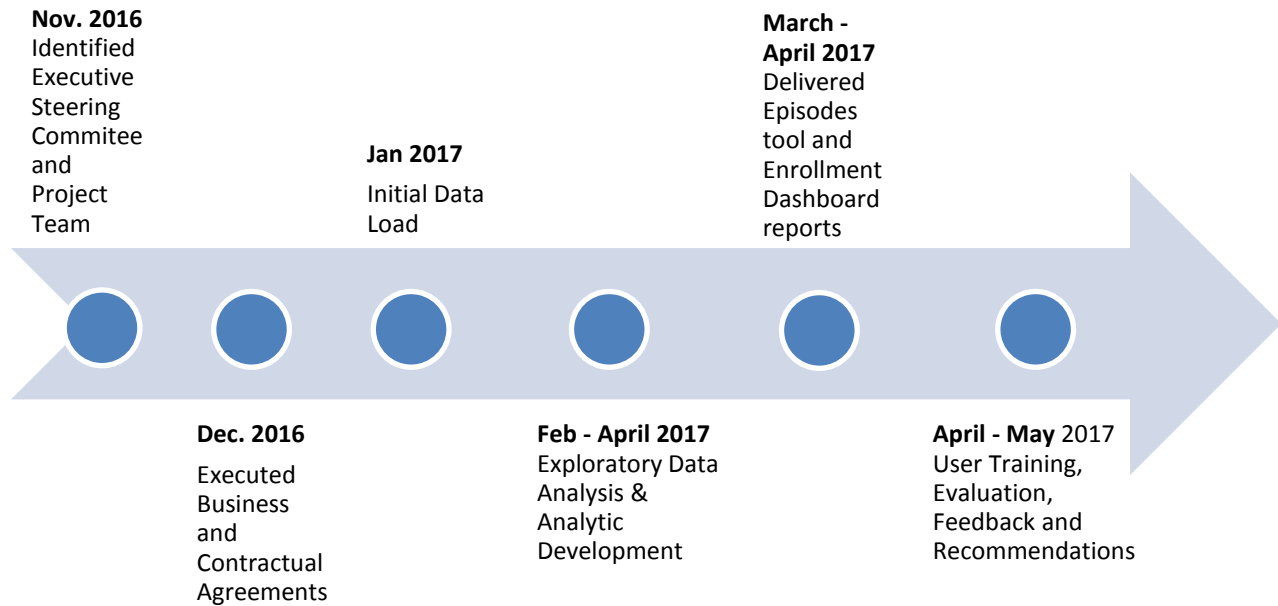
DHHS (Medicaid and Information Technology Division), and GDAC collaborated and defined the scope of MAP 2.0 based on the additional directives contained in the Appropriation Act of 2016. The major components of MAP 2.0 included; Medicaid Episode Analytics and Medicaid Enrollment Interactive Reporting.

- Medicaid Episode Analytics uses SAS' Episode Analytics, to bundle medical claims into related episodes of care. An *episode* refers to all medical services that are provided for one patient's medical problem or condition during a specified time-period. Episodes are constructed using professional, outpatient, inpatient, and pharmacy claims that are signaled through some event, which can include hospitalizations, other facility services, or professional services. Episode Analytics enables retrospective and prospective analyses in support of bundled payments, share savings, to share financial and clinical risk, and to expose potentially avoidable complications.
- Medicaid Enrollment Interactive Reporting comprises custom-developed interactive reporting dashboards for Medicaid enrollment. These dashboards were developed based on requirements provided by Medicaid enrollment subject matter experts using SAS Visual Analytics

- DHHS recommended the MAP 2.0 analytics leverage the existing Transformed Medicaid Statistical Information System (TMSIS) data extracts developed for the Center for Medicare and Medicaid Services (CMS). TMSIS data is a federally defined set of data consisting of claims, encounters, Third Party Liability (TPL), beneficiary, and provider information that is used by CMS for federal-level Medicaid analytics. TMSIS data is extracted from the NCAnalytics data warehouse. For the Health Analytics Pilot, the substance abuse data was removed prior to transmission to the GDAC to comply with data protection prescribed under 42 CFR Part 2.

Timeline and Accomplishments

MAP 2.0 Timeline:



The following key milestones have been completed:

1. Identified business and data requirements for MAP 2.0 using TMSIS data; developed and tested the processes to remove Substance-abuse-related data from TMSIS data.
2. Executed necessary Data Use Agreements, Business Associate Agreements, and Contractual Agreements.
3. Completed secure data transmission process testing.
4. Transmitted monthly TMSIS data comprising of 4 claim files per month and 4 non-claim files (Provider, Eligibility, TPL and Managed Care) for the timeframe of July 2015 through September 2016.
5. Established technical environment for MAP 2.0 including installing SEA components and new data Extract-Transform-Load (ETL) process associated with new data sources.
6. Completed exploratory Data Analysis of Medicaid claims data consisting of 257 million claim lines, 674 million detailed records and 68 million supporting records.
7. DHHS provided GDAC resources with the business rules and technical knowledge transfer to assist in the transformation of TMSIS data into analytics.
8. Transformed TMSIS data into formats needed for automated reporting and analysis.
9. Configured SAS Episode Analytics tool. The SAS Episode Analytics Tool includes one episode constructed by SAS which could be customized.
10. Configured SAS Visual Analytics Interactive Enrollment Dashboard for reporting and analytics, which includes six interactive multidimensional report “views” of the enrollment data.
11. Completed MAP 2.0 user training and testing.
12. Completed MAP 2.0 user evaluation.

Health Analytics Implementation Observations

1. DHHS Pilot users included a diverse set of management and staff professionals associated with Medicaid Reform, current Medicaid operations, and DHHS Information Technology. These Pilot users participated in a two-day interactive training session. Initial user feedback provided sufficient positive comments to warrant additional business engagement and business use case development to better define the operational use and values. The Health Analytics Pilot reinforced the value of visual depiction of data and interactive reporting.

Examples of the Health Analytics Pilot analytics are included in Appendices A and B.

The Health Analytics Pilot has identified operational logistics and strategic design considerations that should be factored into the immediate next steps and long-term direction of Medicaid analytics.

- The content and amount of data provided to GDAC support extensive Medicaid data analyses and is consistent with GDAC’s mission of managing *data sharing and integration* initiatives, including “identifying opportunities where data sharing and integration can generate greater efficiencies and improved service delivery” by State agencies, institutions and departments. It does not, however, comprise all the Medicaid data that is available or required to support operational and tactical data analyses associated with operating a Medicaid program.

The decision to adopt TMSIS as the source of ongoing Medicaid data for GDAC was made based on balancing the amount of data made available for GDAC-based analyses and the logistical feasibility of regularly transmitting large amounts of Medicaid data to GDAC.

- GDAC is reviewing options to be able to begin receiving data protected under 42 CFR Part 2 that must currently be excluded from data provided to GDAC.

The Medicaid program is currently undergoing fundamental transformation to a performance and value-based managed care model. The comprehensive program requirements, operating model and business processes have yet to be developed. Further investment in the development of data analytics to support the reformed Medicaid program should be based on requirements that are not yet known.

Recommendation

The results of the Health Analytics Pilot efforts demonstrate the value of interactive, visually depicted analyses. The pilot program should move forward with the operationalization of the existing Health Analytics pilot program components in accordance with the legislative mandate using the resources remaining from Session Law 2015-241.

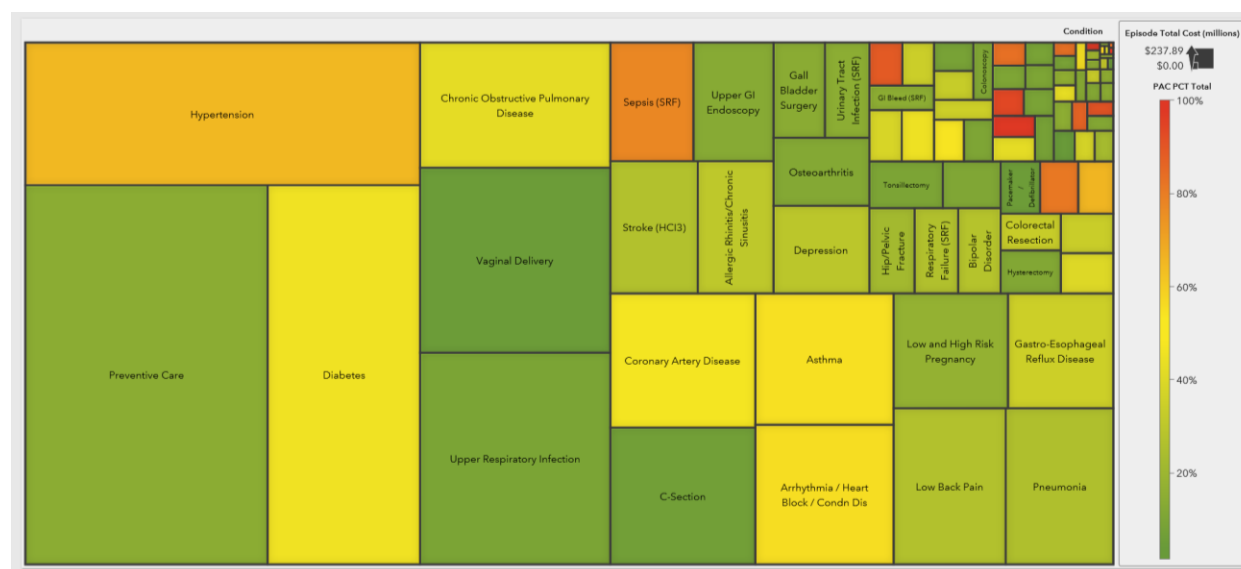
DHHS and GDAC will collaborate to develop a Healthcare Analytics Roadmap to optimize positive impacts on health outcomes by identifying opportunities to leverage additional data available within GDAC (to include the identification of relevant social determinants of health from other departments’ data) and the HIE to develop data analyses which provide a more comprehensive understanding of population health. Where appropriate this Analytics Roadmap will foster participation from other public sector healthcare partners.

APPENDIX A: Episode Analytics Screen Samples

SAS Episode Analytics bundles medical claims together in related episodes of care, and each episode is processed and paid. An *episode* refers to all medical services that are provided for one patient's medical problem or condition during a specified time period. Episodes are constructed using professional, outpatient, inpatient, and pharmacy claims that are signaled through some event, which can include hospitalizations, other facility services, or professional services. Care can be categorized as typical or complication. There are also claims that are unrelated and, therefore, do not belong to an episode.

Episodes of care are clinically-logical aggregations of service-line claims that allow for analysis of the frequency, costs, and components of health conditions and events.

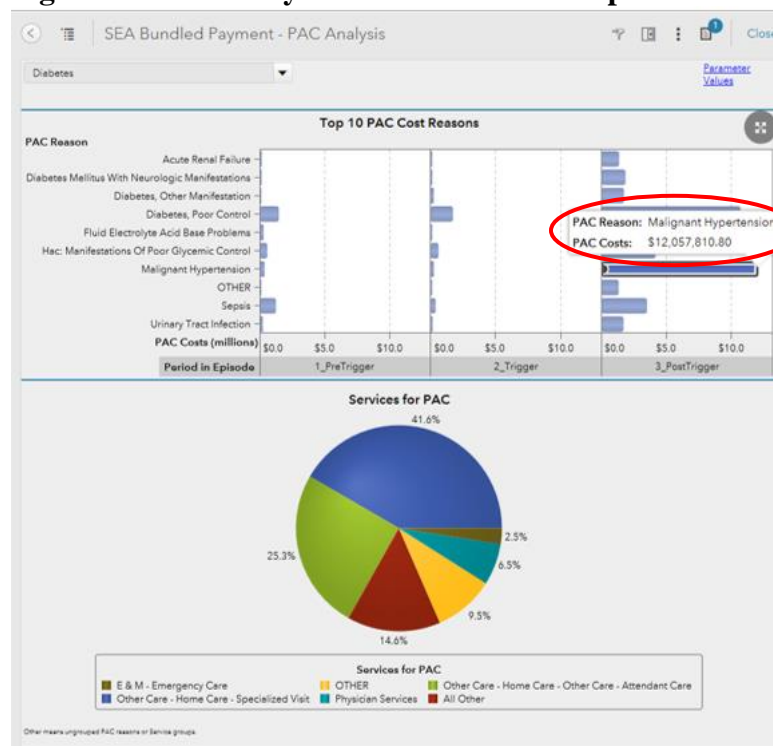
Figure 1: Overview of Costs of Episodes of Care within NC Medicaid Population July 2015-June 2016 – Total Episode Costs (Size) and Percent of Cost Due to Potentially Avoidable Complications (Color)



Costs associated with chronic condition episodes are driving total episode costs. In addition to calculating episode costs, SAS Episode Analytics identified significant costs within chronic condition episodes that could have potentially been avoided with better care, known as Potentially Avoidable Complications (PACs).

- For example, in SFY 2016 nearly half of all costs associated with Diabetes and Asthma episodes are classified as PAC costs.
- Drilling into this further, Malignant Hypertension is a significant driver of PAC costs for episodes of Diabetes. Services received in the home account for over 2/3^{ds} of these costs.

Figure 2: Potentially Avoidable Costs for Episodes of Diabetes



Malignant Hypertension represents over \$12M in PAC costs for episodes of Diabetes.

Services received in the home (green and blue) account for over 2/3rds of these costs.

Comparing actual to risk adjusted expected episode costs by the Provider attributed to the episode indicates there may be opportunity for alternative payment methods aimed at reducing costs and improving quality. For example, the costliest provider of Upper GI Endoscopy episodes is associated with over 850 episodes and \$1.6M in total episode costs.

- After adjusting for the case mix/severity of the episodes treated by this provider, we would have expected total episode costs to be about \$1.3M.
- In other words, this Provider's actual costs for Upper GI Endoscopy episodes is nearly 20% higher than we would have expected.
- In addition, PAC costs for this Provider are over twice as much as we would have expected.

Figure 3: Risk-adjusted Costs for Episodes of Upper GI Endoscopy, by Provider
(Provider IDs have been masked)



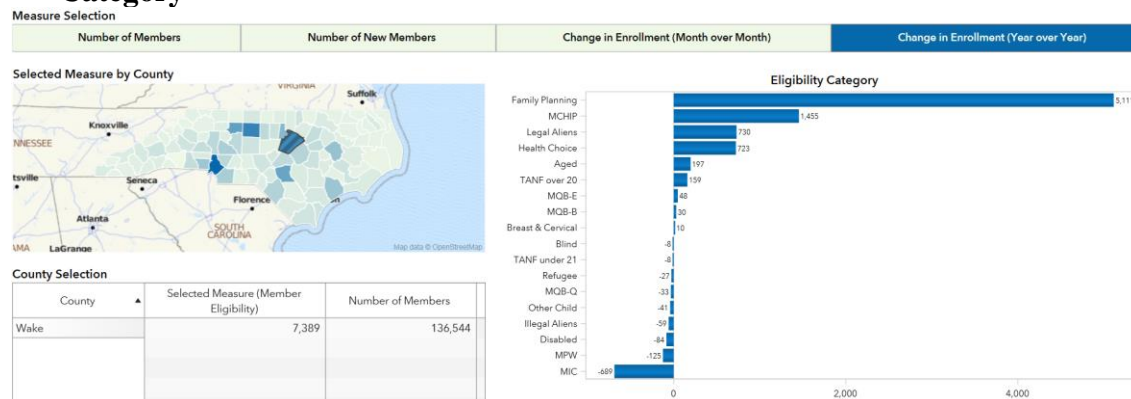
Appendix B: Enrollment Interactive Report Samples

This report allows the user to identify various enrollment measures based on categorizations of member eligibility and demographic information. Report measures include total enrollment, number of new members, year-over-year and month-over-month change in enrollment, and percent of population enrolled.

ENROLLMENT DASHBOARD

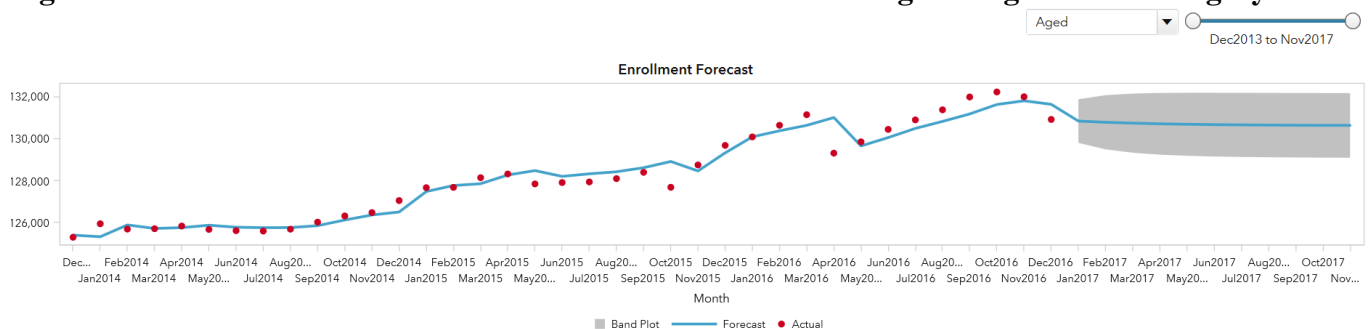
In the screenshot below the user selected year-over-year change in enrollment and filtered to Wake County using the map. The bar graph displays year-over-year change for Wake County by Program Aid Category.

Figure 4: Year-Over-Year Change in Enrollment for Wake County, by Program Aid Category



In this screenshot, the user is viewing a twelve-month forecast of Medicaid enrollment for the Aged Program Aid Category.

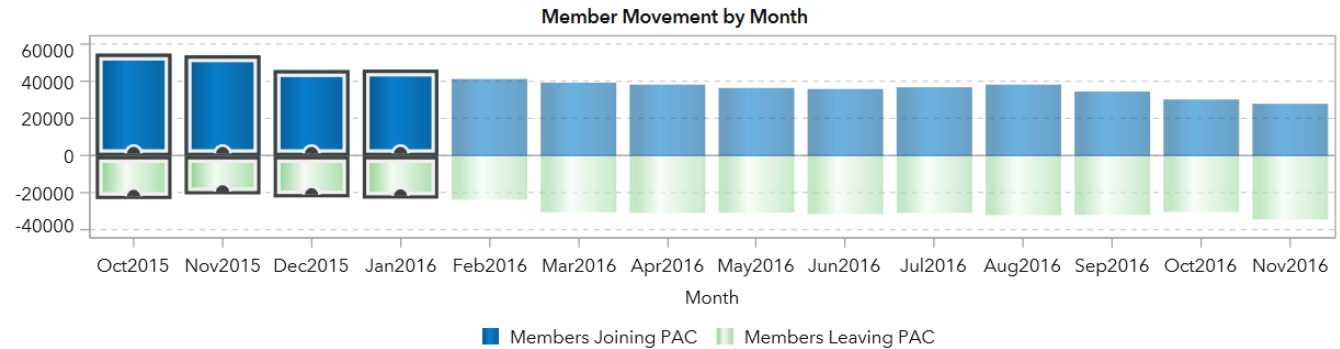
Figure 5: Actual and 12-Month Forecasted Enrollment for the Aged Program Aid Category



For the use case below, the user is interested in understanding changes in enrollment for the MAF Program Aid Category. In the screenshot below she has selected four months from the trend where the size of the blue and green bars indicates a significant net gain in enrollment. The tiles below

show that prior to joining MAF in these months, these members were mostly commonly in the MICN Program Aid Category, or not enrolled in Medicaid at all.

Figure 6: Patterns of Members Joining the MAF Program Aid Category

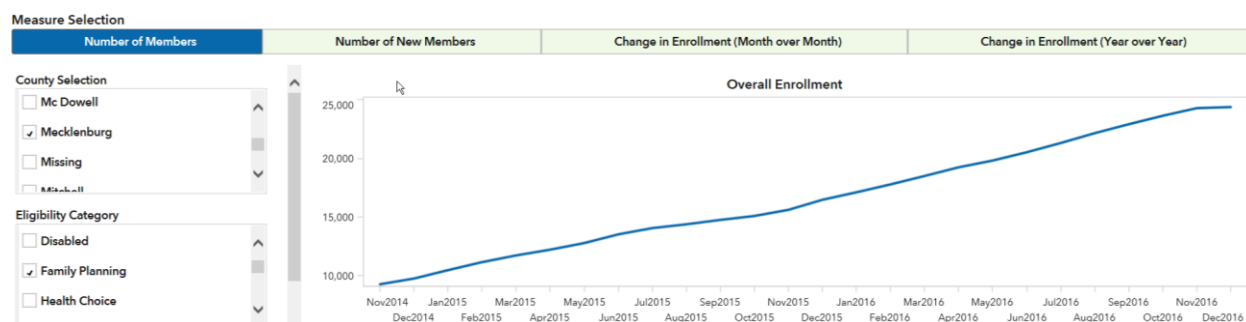


Joining from PACs



In the screenshot below, the user selected member enrollment and filtered to Mecklenburg County Family Planning Program Aid Category using check box filters. The line graph displays the trend for Mecklenburg County enrollees in the Family Planning Program Aid Category.

Figure 7: Enrollment Dashboard: 24-Month Enrollment Trend for the Family Planning Program Aid Category in Mecklenburg County



In the screenshot below, the user filtered to Mecklenburg County using the map and is viewing a trend line of the % of population enrolled and number of members enrolled. A reference line

showing the state-wide average % of population enrolled in the most current month on the dashboard is also displayed.

Figure 8: Enrollment Dashboard: One Year Trend of Percent of Population Enrolled in Mecklenburg County

