Florida
MEDS-AD Waiver

Annual Report
January 1, 2014 – December 31, 2014

Demonstration Year 9

1115 Research and
Demonstration Waiver
#11-W-00205/4

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I. Introduction

This annual report includes programmatic and financial activities for Demonstration Year Nine (DY9), January 1, 2014, through December 31, 2014. By implementing Florida's 1115 MEDS-AD Waiver (MEDS-AD Waiver), the Agency for Health Care Administration (Agency) seeks to demonstrate that the total cost of providing access to care for the MEDS-AD population (including costs for the Medication Therapy Management (MTM) program) will not exceed expected long-term cost of care for these individuals had they not received coverage until they required institutional care.

II. Waiver History

1. Legislative Changes

Prior to 2005 changes to section 409.904, Florida Statutes, the MEDS-AD eligibility group was defined as an optional program for persons who were age 65 years or older or who were determined to be disabled; whose assets did not exceed established limitations; and whose incomes were at or below 88% of the federal poverty level (FPL). Individuals eligible for the program could receive Medicaid medical assistance payments and related services. In 2005, concurrent with federal Medicare Part D implementation, the Florida Legislature amended the statutory eligibility criteria for the MEDS-AD program and directed the Agency in Chapter 2005-60, Laws of Florida, to seek federal waiver authority to revise Medicaid eligibility coverage for the Medicaid MEDS-AD eligibility group beginning January 1, 2006. The eligibility changes to the MEDS-AD program maintained eligibility for qualified recipients without Medicare coverage and eliminated coverage for dually eligible individuals unless the person is eligible for and receiving Medicaid hospice services, home and community-based services, or institutional care services. The initial demonstration ended on December 31, 2010. The State received approval for a three-year renewal of federal waiver authority through December 31, 2013, for the MEDS-AD demonstration. The State submitted a request to the Centers for Medicare and Medicaid Services (CMS) for an additional three-year renewal June 28, 2013. CMS granted a one-year temporary extension for the waiver until December 31, 2014, and an additional one-year temporary extension until December 31, 2015.

2. Program Design

To implement the Legislative changes described above, the State amended Florida Medicaid's state plan to eliminate the former MEDS-AD eligibility category and submitted an 1115 demonstration waiver for aged or disabled residents of the State of Florida with incomes at or below 88% of the FPL and assets at or below $5,000 for an individual and $6,000 for a couple. Coverage is limited to those aged and disabled persons who are either receiving or elect to receive hospice services, home and community-based services, or institutional care services or who are not eligible for Medicare. The new MEDS-AD program is designed to prevent premature institutionalization of these vulnerable individuals by maintaining their level of care in the community longer through the provision of:

- Access to health care services
- Medication therapy management

The continued coverage, as well as the MTM program, will be funded through savings obtained by avoiding institutional costs that would otherwise occur in the next five years had these vulnerable individuals been denied access to prescribed drugs and other medical services. The

focus of the demonstration is to provide MTM for enrollees who are not yet receiving institutional care.

3. Waiver Extension Request

In December 2010, the State received approval from CMS for the renewal period January 1, 2011, through December 31, 2013. During the 2011 Legislative Session, the State funded the MEDS-AD Waiver through state fiscal year 2011–2012, and in 2012 funding was extended through state fiscal year 2012–2013. On June 28, 2013, the State submitted a renewal request under 1115(a) authority to extend the MEDS-AD Waiver through December 31, 2016.

The Centers for Medicare and Medicaid Services granted the State a one-year temporary extension on August 14, 2013, extending the current waiver period to December 31, 2014. See Appendix A for a copy of the letter from CMS granting the second one-year temporary extension.

4. Maintenance of Effort Provisions in Sections 1902(a)(74) and 1902(gg)

The MEDS-AD Waiver was renewed by CMS after March 23, 2010; therefore, it is no longer subject to the maintenance of effort provisions of the Patient Protection and Affordable Care Act.

III. Budget Neutrality Update

Table 1 compares actual waiver expenditures to the costs projected for this population had the waiver not been granted. To date, actual expenditures have been below the projected cost.

Table 1 Budget Neutrality MEDS-AD Waiver							
Demo Year	Quarter Ended	WW Expenditures ($)	WW Expenditures Cumulative Total ($)	WOW (Target) Expenditures ($)	WOW Expend Total ($)	Difference ($)	Cumulative Difference ($)
DY1	Q1	51,696,950		507,710,894		456,013,944	
	Q2	132,235,096		507,710,894		375,475,798	
	Q3	105,271,113		507,710,894		402,439,781	
	Q4	146,356,839	435,559,998	507,710,894	2,030,843,575	361,354,055	1,595,283,577
DY2	Q5	69,927,763		460,700,626		390,772,863	
	Q6	79,047,475		460,700,626		381,653,151	
	Q7	87,567,517		460,700,626		373,133,109	
	Q8	90,210,963	762,313,716	460,700,626	3,873,646,079	370,489,663	3,111,332,363
DY3	Q9	93,882,619		455,999,599		362,116,980	
	Q10	103,108,178		455,999,599		352,891,421	
	Q11	95,761,142		455,999,599		360,238,457	
	Q12	96,128,169	1,151,193,824	455,999,599	5,697,644,476	359,871,430	4,546,450,652
DY4	Q13	107,727,900		465,401,653		357,673,753	

Demo Year	Quarter Ended	WW Expenditures ($)	WW Expenditures Cumulative Total ($)	WOW (Target) Expenditures ($)	WOW Expend Total ($)	Difference ($)	Cumulative Difference ($)
	Q14	106,365,677		465,401,653		359,035,976	
	Q15	120,849,499		465,401,653		344,552,154	
	Q16	133,665,863	1,619,802,762	465,401,653	7,559,251,086	331,735,790	5,939,448,324
DY5	Q17	138,153,082		460,700,626		322,547,544	
	Q18	144,229,555		460,700,626		316,471,071	
	Q19	134,966,909		460,700,626		325,733,717	
	Q20	148,599,566	2,185,751,874	460,700,626	9,402,053,590	312,101,060	7,216,301,716
DY6	Q21	154,004,876		*			
	Q22	146,340,361		*			
	Q23	155,268,617		*			
	Q24	163,774,246	2,805,139,974	*	9,402,053,590		6,596,913,616
DY7	Q25	165,396,338		*			
	Q26	184,629,761		*			
	Q27	165,063,579		*			
	Q28	168,922,270	3,489,151,922	*	9,402,053,590		5,912,901,668
DY8	Q29	151,084,893		*			
	Q30	150,685,372		*			
	Q31	159,542,998		*			
	Q32	162,697,430	4,113,162,615	*	9,402,053,590		5,123,996,918
DY9	Q33	158,788,398		*			
	Q34	78,648,235		*			
	Q35	56,437,124					
	Q36	116,880,369	4,523,916,741	*	9,402,053,590		4,878,136,849

*The original WOW expenditure ceiling was not increased with the renewal period beginning in Quarter 21. The $7,216,301,716 cumulative difference between the approved budget neutrality ceiling and actual waiver expenditures as of the end of the original demonstration period on December 31, 2010, was allocated across the 12 renewal quarters as the new expenditure ceiling.

IV.   Operational Update

1. Eligibility and Enrollment

The Florida Department of Children and Families (DCF) is responsible for conducting intake, assessment, eligibility determination, enrollment, disenrollment, and data collection on the availability of third-party coverage, including Medicare, and annual re-determinations of eligibility.

To be eligible for the MEDS-AD Waiver, recipients must be at or below 88% of the FPL with assets at or below $5,000 for an individual ($6,000 for a couple) and be in one of the following Medicaid Eligibility Groups (MEGs):

- **MEG 1 (MA-Medicaid Only):** Medicaid Only eligibles *not* currently receiving hospice, home and community based services, or institutional care services.

- **MEG 2 (MA-Medicaid Institutional):** Medicaid Only eligibles currently receiving hospice, home and community based services, or institutional care services.

- **MEG 3 (MA-Dual Eligibles):** Medicaid and Medicare (dual) eligibles receiving hospice, home and community based services, or institutional care services. Individuals with Medicare are not eligible for this waiver unless they meet the conditions of MEG 3.

Individuals in MEG 1 must select a Managed Medical Assistance (MMA) plan in their region. If the recipient does not select an MMA plan they will be assigned to one. Information on the MMA program can be found on the Agency's Web site at the following link: http://ahca.myflorida.com/medicaid/statewide_mc/index.shtml.

Table 2 details the total count of individuals enrolled through the MEDS-AD Waiver for DY9 (January 1, 2014 – December 31, 2014) by month.

Table 2 Enrollment MEDS-AD Waiver January 1, 2014 – December 31, 2014	
January 2014	35,574
February 2014	35,715
March 2014	35,491
April 2014	37,893
May 2014	37,817
June 2014	37,056
July 2014	39,014
August 2014	39,053
September 2014	38,500
October 2014	40,333
November 2014	40,246
December 2014	40,007

2. Comprehensive Medication Reviews

The comprehensive medication review focuses on the MEG 1 fee-for-service group within the waiver since these individuals are not receiving institutional care or are served by a managed care entity. The process includes an initial direct telephone contact to a recipient from a clinical pharmacist who explains the review process and invites the recipient to participate. If the recipient agrees, a call with a case reviewer is scheduled for performance of a Comprehensive Medication Review (CMR). A Medication Action Plan (MAP) is then developed. Quarterly follow-up reviews of the patient health information and claims history are performed to track the result of the review and feedback to the prescriber. The patient and prescriber are contacted again if issues or risks are identified.

Through this method of review, certain desired outcomes are produced, such as accurate identification of the primary care provider which has facilitated the effective and timely communication of specific review recommendations to the provider. Reviewers are able to effectively gauge the impact of recommendations during the quarterly follow-up process, as demonstrated in the actual changes or adjustments made by the care provider in the recipient-specific health and medication profiles. Direct contact with recipients has allowed accurate gathering of health information and perceptions of outcomes. The responses and feedback from surveyed recipients, who have participated in the case review process, has been positive overall. In an effort to observe the long-term impact of the reviews, recipients who have completed a previous year's process (as of 2013) are continuing to be allowed to participate in subsequent review cycles.

3. Data Mining Activities

The current status of initiatives resulting from the data mining activities approved for the DY9, January 1, 2014 – December 31, 2014.

There were a total of 77 data mining analysis requests submitted by the Medicaid Fraud Control Unit (MFCU) staff:

- MFCU completed: 34
- Agency denied: 14
- MFCU denied: 2
- Approved & assigned - in process: 27
- Approved & in cue for assignment: 0
- Awaiting Agency response: 0

V. Evaluation Activity

1. Evaluation Requirements

The Agency has contracted with Florida State University to conduct an independent evaluation of the Medication Therapy Management (MTM) program and Data Mining Activities under the waiver during the renewal period (January 1, 2011 – December 31, 2014) of the MEDS-AD section 1115 Research and Demonstration. The evaluation plan for the waiver renewal period was submitted to CMS on April 29, 2011. No deficiencies were noted, and the evaluation activities are proceeding as planned.

2. MEDS-AD MTM Program Description, Design and Initial Findings

The goals of the MTM program, implemented by the University of Florida's (UF) College of Pharmacy (COP), are to improve the quality of care and prescribing practices based on best-practice guidelines, improve patient adherence to medication plans, reduce clinical risk, and lower prescribed drug costs and the rate of inappropriate spending for certain Medicaid prescription drugs for a high-risk population of Medicaid recipients. The UF COP uses high-intensity pharmacy case management services in conjunction with access to appropriate medical care for select aged and disabled individuals as a way to maintain care in the community and prevent premature institutionalization. The program is to be budget-neutral and incorporate innovative service concepts. The Special Terms and Conditions of the MEDS-AD Waiver require that the total cost of medical services and MTM for persons who are enrolled in the MEDS-AD Waiver be compared with the estimated cost of institutional care that is avoided.

During the past year the research team, contracted to oversee the evaluation activities of the demonstration, submitted several analyses related to the MTM program evaluation for three cohorts. The intervention period, the period of time the MTM program was utilized, for Cohort 1 (Year 1) encompassed the period from June 1, 2011, through May 31, 2012; Cohort 2 (Year 2) was June 1, 2012, through May 31, 2013; and Cohort 3 (Year 3) was June 1, 2013, through May 31, 2014. The intervention group population for all three cohorts totaled 456 recipients. Analyses also included a pre-intervention (observation) period of one year for all cohorts.

The MTM program's final evaluation report integrates findings across all quantitative and qualitative evaluation questions for MTM participants, MTM eligible non-participants, and a matched group (age, gender, health status, etc.) of the MTM eligible non-participants using the latest available data for inpatient, outpatient, long-term care, medical, and pharmacy claim types. See Appendix B for the MEDS-AD Waiver (MTM) Program Final Report.

A thorough examination of many health, utilization, and financial outcomes potentially influenced by the MTM intervention produced the following findings:

- Improvements were seen in some areas but did not reach statistical significance. Those areas included:
    - Medication adherence (the encouragement of pharmacists was credited as instrumental in that adherence)
    - Pharmacy reimbursement savings
    - Fewer hospitalizations and lower likelihood of emergency department visits
- More physician engagement with pharmacists is needed to enhance the number of problems identified by the UF COP that are resolved.

The demonstration period for the MEDS-AD Waiver was extended through December 31, 2015; therefore, the contract that oversees the evaluation activities will be renewed for an additional year as well. For Year 4 of the contract, the research team will continue to perform ongoing analyses of the demonstration, and will follow a fourth cohort (June 1, 2014 – May 31, 2015).

See Appendix C for the MEDS-AD Waiver Evaluation: Data Mining Activities Evaluation – Final Report.

Appendix A
One-Year Temporary Extension
January 1, 2015 – December 30, 2015

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop S2-01-16
Baltimore, Maryland 21244-1850

CMS
CENTERS FOR MEDICARE & MEDICAID SERVICES
CENTER FOR MEDICAID & CHIP SERVICES

<u>Children and Adults Health Programs Group</u>

NOV 2 1 2014

Justin Senior
Deputy Secretary for Medicaid
Florida Agency for Health Care Administration
2727 Mahan Drive, Mail Stop 8
Tallahassee, FL 32308

Dear Mr. Senior:

With this letter, the Centers for Medicare & Medicaid Services (CMS) is granting a temporary extension of Florida MEDS-AD section 1115 Demonstration (Project No. 11-W-00205/4), effective January 1, 2015 until December 31, 2015. The demonstration is currently operating under the authority of section 1115(a) of the Social Security Act. The list of waiver and expenditure authorities and Special Terms and Conditions (STCs) will continue to apply. These have been updated to reflect the revised demonstration expiration date. We have also incorporated a technical change to the expenditure authority, to accommodate the expiration of the 1915(b) Medicaid Managed Care Waiver and expansion of Medicaid managed care statewide through the Managed Medical Assistance 1115 demonstration.

CMS approval of this temporary section 1115 demonstration extension is subject to the limitations specified in the approved waiver and expenditure authorities and the list of requirements that are not applicable to the expenditure authorities. The state may deviate from the Medicaid state plan requirements only to the extent those requirements have been specifically listed as waived or not applicable to the expenditure authorities. All requirements of the Medicaid program as expressed in law, regulation, and policy statement not expressly waived or identified as not applicable shall apply to Florida's MEDS-AD program. This approval is also conditioned upon continued compliance with the enclosed STCs defining the nature, character, and extent of federal involvement in this project. Although this extension continues the expenditure authority for Medicaid Fraud Control Unit (MFCU) data mining activities, the state has other authority for these expenditures, as described in the Department of Health and Human Services final rule issued May 17, 2013 (78 FR 29055-29061). We expect that the state will continue with these activities, will claim its expenditures as permitted under that final rule, and will ensure that no duplicate claiming will occur.

These approvals are conditioned upon written acceptance from the state that it agrees with the amendments, expenditure authorities, and STCs. This written acceptance is needed for our records within 30 days of the date of this letter.

Your project officer is Ms. Heather Hostetler. Ms. Hostetler's contact information is as follows:

>Centers for Medicare & Medicaid Services
>Center for Medicaid & CHIP Services
>Division of State Demonstrations and Waivers
>7500 Security Boulevard
>Mail Stop: S2-01-16
>Baltimore, MD 21244-1850
>Telephone: (410) 786-4515
>Facsimile: (410) 786-8534
>E-mail: Heather.Hostetler@cms.hhs.gov

Official communications regarding program matters should be sent simultaneously to Ms. Hostetler and to Ms. Jackie Glaze, Associate Regional Administrator in our Atlanta Regional Office. Ms. Glaze's address is:

>Jackie Glaze
>Centers for Medicare & Medicaid Services
>Atlanta Federal Center, 4th Floor
>61 Forsyth Street, SW Suite 4T20
>Atlanta, GA 30303-8909
>Telephone: (404) 562-7417
>E-mail: Jackie.Glaze@cms.hhs.gov

We look forward to continued discussions with you regarding the future of the MEDS-AD demonstration.

Sincerely,

Eliot Fishman
Director

Enclosures

cc: Jackie Glaze, Associate Regional Administrator, Region IV

Appendix B
Medication Therapy Management Program
Final Report

Deliverable #24

MEDs-AD Waiver (MTM) Program Final Report

Prepared for Florida Medicaid
In Partial Fulfillment of Contract MED143

College of Medicine
Florida State University

March 16, 2015

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Executive Summary

This report summarizes the final findings of the pre-intervention period (prior to June 1, 2011) and the MEDs-AD Waiver (intervention) years (June 1, 2011 through May 31, 2014) for the quantitative and qualitative evaluation of the Florida Medicaid Medication Therapy Management (MTM) intervention implemented by the University of Florida (UF) College of Pharmacy (COP). This report includes findings based on combined or pooled data for the first three years of the current waiver for the MTM program interventions beginning in 2011 (Year 1 Cohort 1), 2012 (Year 2 Cohort 2), and 2013 (Year 3 Cohort 3). The goals of the MTM program are to improve the quality of care and prescribing practices based on best-practice guidelines, improve patient adherence to medication plans, reduce clinical risk, and lower prescribed drug costs and the rate of inappropriate spending for certain Medicaid prescription drugs for a high-risk population of Medicaid recipients eligible through Florida's Section 1115 MEDs-AD Research and Demonstration Waiver (MEDs-AD Waiver).

Within the quantitative component, MTM program participants (MTM-P) are compared with MTM program non-participants (MTM-NP). The MTM-NP is also referred to as comparison group 1 (CG1). Medicaid recipients who were members of the MEDs-AD Waiver Medicaid eligible population number one (MEG1), but either declined the opportunity to participate or were never contacted about the opportunity were used to form a second comparison group (CG2). The evaluation uses the latest available data for inpatient, outpatient, long-term care (LTC), medical, and pharmacy claim types as reported to the Florida Medicaid Agency on standard claims forms: UB-04 (facility) and CMS-1500 (professional services) as of September 2014.

Claims and enrollment data used for this report are believed to represent nearly all Medicaid recipient utilization for the period January 1, 2010 to May 31, 2014. Claims files are merged with demographic information. Periods of enrollment under the MEDs-AD Waiver and periods of excluded enrollment were identified. Additional information on the data used for this report is provided in the Method Section. Descriptive and regression tables for the pooled analysis of Cohort 1, Cohort 2, and Cohort 3 for the pre-intervention study period (SP-PRI) and the intervention study period (SP-INT) are presented and contrasted with comparison groups defined later in the report. Findings for the UF COP MTM process measures are also presented for Cohort 1, Cohort 2, and Cohort 3 using data provided by the UF COP MTM program.

The intervention study period for each of the 3 cohorts is 12 months and is preceded by a 12 month observation period before the intervention in order to contrast the pre-intervention utilization with utilization during the intervention year. Therefore, each cohort and comparison group was followed for up to two years as long as the recipients maintained eligibility under the MEDs-AD Waiver for the MEG1 population. The intervention group population for all three cohorts totaled 456 recipients and the MTM-NP (CG1) population for all three cohorts totaled 1,540 recipients before attrition. Additional information on the construction of comparison groups and the relationship between cohorts is presented in the Methods Section.

Evaluation Questions Addressed in this Report

1. What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2[1] for utilization measures?
2. What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for expenditure measures?
3. What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for clinical outcomes?
4. What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for demographic categories?
5. What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for mortality and morbidity measures?
6. What are the differences in the pre-intervention and intervention periods within the intervention group for MTM process measures?
7. What are the most successful aspects of the MTM program based on participant perspectives?
8. What are the lessons learned from this program from the perspectives of Florida Medicaid administrative personnel (MCAP), MTM staff, recipients (i.e., participants), and Primary Care Physicians (PCPs)?

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[1] Comparison group 1 is formed from recipients who gave consent to AHCA staff to be contacted by the MTM program vendor (UF COP) but who either refused to participate when contacted by the vendor or were not contacted by the vendor. Comparison group 2 members are drawn from the eligible MEDs-AD Waiver population that were either not called by AHCA staff or did not give consent for their names to be forwarded to UF COP staff by the AHCA pharmacy program.

9. How does this program impact recipients' (i.e., participants') ability to understand medications, take a more active part in their care, and understand the questions to ask their doctor or when to contact their doctor?
10. How do recipients view this program from individual perspectives?

Integrated Findings

The findings contained in this report integrate both quantitative and qualitative research and analyses of data from multiple sources. By reviewing existing literature, conducting quantitative analyses, qualitative participant and key informant interviews, and identifying best practices, the evaluation team was able to better examine the totality of the MTM program under the MEDs-AD Waiver. The current literature on MTM suggests that many patients receiving MTM counseling see improved health outcomes that include: 1) better medication adherence, 2) reduced exposure to potential drug-drug or drug-disease interactions, 3) reduced instances of over or under medication, and 3) better control of their conditions as reflected by fewer inpatient hospitalizations and visits to the Emergency Department (ED). Payers have reportedly observed lower medical and prescription drug reimbursements for populations that receive an MTM intervention. However, the majority of the published literature evaluating MTM programs was conducted on populations of working age adults covered by private insurance through their employer or within the covered population of private insurance companies providing Medicare Part D coverage to an elderly Medicare population. Typically, these published evaluations included a large number of patients who received MTM counseling and were followed for at least one year.

The object of this evaluation was to examine the effectiveness of an MTM program in the context of a publicly funded Medicaid population of mostly working age adults who are not working due to the impact their disease or condition has on their ability to function in the workplace. Social determinants of health are known to play a larger role in the observed health outcomes of persons covered by Medicaid as compared with private insurance.

A variety of utilization, financial, and clinical outcomes of interest were compared that controlled for demographic factors, chronic disease burden, and length of enrollment. The evaluation of the Florida Medicaid MTM program for all three combined cohorts of recipients receiving the MTM intervention between 2011 and 2014 found no statistically significant differences between the intervention group and comparison groups constructed from Medicaid recipients from the same eligibility pool who did not receive the MTM intervention. This finding was consistent in our strongest analytic models across all

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the economic, service utilization, and clinical outcomes measured. These models were fully adjusted models controlling for age, race, ethnicity, gender, morbidity, and length of enrollment.

This contrasts with findings reported in our previous report[2] that found a statistically significant difference for the Cohort 2 population for the number of inpatient discharges and the likelihood of one or more inpatient discharges, suggesting improvement among MTM participants from the pre-intervention to the intervention year as compared with the MTM non-participant group.

The current evaluation did identify one model, inpatient discharges, that suggested the intervention group had overall lower odds of one or more inpatient discharges (OR-0.78, p=.066) across all study periods; but after controlling for baseline differences between the intervention and comparison group, the difference was not statistically significant (p=0.85).

Less rigorous descriptive measures that adjusted only for the length of enrollment found lower average reimbursement costs per recipient for inpatient care in the intervention group as contrasted with a comparison group during both the pre-intervention and intervention periods and a larger decline from pre-intervention to intervention periods. However, this measure does not control for population characteristics nor specifically test the difference in differences (DiD) from baseline to intervention period.

Although the estimates for the propensity score matching models were not statistically significant, the average treatment effect per recipient in the models for total reimbursement were lower in the MTM-P group (Table 28).

Although no direct comparison group is available to gauge UF COP MTM services against, UF COP staff identified many problems among the three cohorts of MTM-P (nominal n=455).
- 54 clinically significant Level 1 or 2 drug interaction problems were identified.
- 43 instances where pill burden could be decreased, opportunities for combination therapy, or removal of duplicate therapies.
- 235 instances of a gap in therapy, insufficient dosage, insufficient duration of therapy, or a lack of therapy were identified.

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[2] MEDs-AD Waiver (MTM) Program Evaluation—Final Report Prepared for Florida Medicaid by the Florida State University College of Medicine, April 18, 2014 (page 52).

- The mean number of problems identified per MTM-P group member was 0.7, 1.3, and 0.4 for Cohorts 1, 2, and 3, respectively.
- The mean percentage of identified problems resolved was 28.6%, 40.9%, and 10.2% for Cohorts 1, 2, and 3, respectively.

Physician engagement with the Florida Medicaid MTM process continues to be a problem, similar to what was reported in other MTM evaluations.

Possible explanations for the divergent findings for the outcomes studied between the published findings on MTM programs and the results of this evaluation may be categorized as:

1. Characteristics of the MEG1 Florida Medicaid population that make measurement and evaluation difficult may mask a true benefit that could not be identified,
2. Characteristics of the design and implementation of previously published evaluation studies and their target populations make them a poor comparison for this study population, and
3. The program simply has not produced any statistically significant differences in the fully adjusted metrics included for this evaluation.

Each of these possible explanations is explained below:

Characteristics of the Florida MEDs-AD Waiver MEG1 Population. The MEG1 population studied for this evaluation is dynamic with members exiting and occasionally reentering eligibility over the course of the pre-intervention and intervention year. Very few intervention or comparison group members were followed for two full years. Half or more were followed for 6 months or less during the two year study window for each cohort. Persons become ineligible when they become eligible for Medicare as a result of age or meeting the two-year waiting period for receiving Medicare benefits as a disabled individual younger than age 65. A smaller number become ineligible for the MTM program by entering into LTC facilities, hospice, or HCBS and still others become covered under a MCO and are therefore ineligible. It was not unusual to see more than one exclusionary criteria met in the same program year for a given person. The dynamic nature of the population makes measurement difficult because recipients are observed for less time than is optimal. By comparison, Healthcare Effectiveness Data Information Set (HEDIS) metrics by the National Committee on Quality Assurance requires 12-24 months of continuous enrollment in order to establish a stable population for measurement.

The Medicaid population is also known to exhibit characteristics that are collectively known as the social determinants of health (SDH)[1,2]. Social determinants of health are the circumstances in which people are born; grow up, live, work, and age, as well as the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics[3]. Healthy People 2020 uses five key areas to categorized the SDH: 1) neighborhood and built environment, 2) economic stability, 3) education, 4) food security, 5) social and community context[4]. SDH are associated with poorer health outcomes. Social determinants of health can be positive or negative but here we refer to determinants that have a negative impact on health. Medicaid recipients are more likely have characteristics that are classified as social determinants of health because they are disproportionately minority (21% black versus 12% national estimates for 2010)[5], living below the Federal Poverty Level (35% vs. 15.1%, 2010 national estimates for 2010)[5], have lower average education, have disproportionately low levels of literacy [6]. The impact of low education[7], low income[8], and low literacy on health behaviors and outcomes have been widely documented[9-12] These characteristics may have a direct bearing on adherence to medical regimens and short and long-term health outcomes. Evidence of the feasibility of addressing these issues can be found in the hospital industry. Recent changes in reimbursement policy have incentivized hospitals to consider mechanisms for reducing re-hospitalizations. Most of these approaches embrace some form of transition program from hospital discharge back to the community that includes social workers or other mid-level providers to help patients "solve problems" that are typically categorized under social determinants of health[13]. The Tallahassee Memorial Hospital Transition Center is a good example of one organization that has demonstrated a business case for addressing social problems in a medical setting[14].

Characteristics of other studies. The other published evaluations of MTM programs are not easily comparable because the privately insured populations in those studies are very different from the MEG1 Medicaid population in Florida. Although positive findings have been reported, the research designs in many of the published studies are not very strong; either the MTM intervention group is studied without any comparison group or the comparison group is not carefully chosen. Comparative effectiveness studies of this sort are very susceptible to misleading findings when a comparison group is not carefully chosen and differences between the intervention and comparison group are not carefully controlled statistically.

No statistically significant differences. It is possible that the lack of statistically significant differences were because none existed in the context of this particular program for the outcome measures studied.

However, the qualitative findings did support several benefits based on the responses to open-ended questions and survey items. For example, the subset of MTM participants consistently stated that their medication adherence was positively enhanced by participation in the program. Furthermore, they also indicated greater understanding of their medications. These beneficial outcomes were based, in part, on positive evaluations of the pharmacists who contacted them. They saw the pharmacists as genuinely caring for them, respectful, and engaged. This dynamic, improved adherence based on a medical partnership, is supported in extant MTM literature. In addition, participants made positive remarks regarding the program itself, indicating that they knew more about the use of each medication. MTM participants also requested continuing the program for a longer period of time. This support for continuation of the program was reflected in earlier interviews with UF COP staff, who expressed a desire to follow MTM participants longer based on their genuine concern for their well-being. When asked what should be changed about the program, MTM participants saw little need to improve the program beyond continuing it longer. The simple survey questions asked at the end of the qualitative interview further support the positive evaluation of the MTM intervention based on participant responses. The third cohort, as with earlier cohorts, almost unanimously endorses the program (see tables 55 and 56).

Recommendations:

1. Continue to evaluate the Florida MTM program over time to improve population size and choose alternate analytic designs and measures to address program effectiveness.
2. Mitigate the loss of sample size due to recipients aging into Medicare by only selecting persons for the original query list that are less than 63 years old. If the original query used by AHCA staff to obtain consent at the first stage only includes persons age 63 and below, then recipients that provide consent and are sent to UF COP will not turn 65 until the post-intervention year.
    a. If feasible, it would be optimal to exclude recipients receiving Medicare or with previous enrollment in an MCO from the original query that is provided to AHCA pharmacy staff.
3. If a written, step-by-step protocol for creation of the original query by AHCA staff does not exist, then create one that addresses the following issues:
    a. Documents the query terms used to create the original query call list.
    b. Explains how to identify recipients who are already ineligible for the MTM program at the time of original query creation due to Medicare, LTC, HCBS, MCO, or hospice utilization before calls are attempted.

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   i. Standard operating procedures would be facilitated by creation of a detailed list of codes that indicate exclusion or inclusion as potential MTM program participants using the Aid Category, Benefit Category, and Assignment Plan data elements. Codes could be reviewed on an annual basis for changes.

 c. Establishes a method for calling recipients on the original query list in random order to provide an equal probability of contacting recipients with the opportunity.

 d. Ensure Spanish speaking pharmacy staff is available to make calls for consent by AHCA staff at the first stage of selection in order to mitigate possible adverse selection probabilities of Spanish speakers.

 e. Provide a check list to AHCA staff calling to obtain consent to assist callers in inquiring about current Medicare, LTC, HCBS, or hospice status before the name is forwarded to the UF COP.

 f. Develop a method to use existing information in AHCA files to identify persons who are likely to become eligible for Medicare before the intervention year is completed. The actual date of the first receipt of SSI may be useful in this regard or perhaps targeting recipients who have been eligible for MEDs-AD for less than 6 months.

4. Consider approaches to improving physician engagement with the MTM program to enhance the number of problems identified by UF COP that are resolved.

5. Consider approaches that address the social determinates of health that are highly prevalent in Medicaid populations. Anecdotal evidence suggests that UF COP staff provide some social work services on an ad hoc basis. Thus, the addition of medical social service agents (e.g., social workers or case managers) to the UF call center could be helpful.

6. Increase the amount of direct contact between the pharmacists and the participants by:

 a. Increasing the number of phone calls required per protocol; and/or

 b. Extending the program for more than the current one-year interval.

7. Increase PCP engagement by notifying physicians that individual patients are enrolled in the program prior to making recommendations.

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List of Tables

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List of Terms, Acronyms, and Abbreviations

Acronym or Abbreviation	Explanation
ACE	Angiotensin-Converting-Enzyme inhibitor
ACG	Adjusted Cost Groups, e.g., John's Hopkins ACGs®
ACSC	Ambulatory Care Sensitive Condition
ADG	Aggregated Diagnostic Groups, a John's Hopkins ACGs® indicator
AHCA	Florida Agency for Health Care Administration
AHEC	Area Health Education Center
AHRQ	U.S. Agency for Healthcare Research and Quality
ARB	Angiotensin Receptor Blockers
ARIMA	Auto-Regressive, Integrated, Moving-Average (a time-series modeling approach)
BETOS	Berenson-Eggers Type of Service codes
CG1	Comparison group 1 constructed from MTM pool sent to UF COP that did not receive the intervention (MTM non-participants, i.e., MTM-NP).
CG2	Comparison group 2 constructed from MEDs-AD eligible recipients whose names were not submitted to UF COP
CI	Confidence Interval
CMR	Comprehensive Medication Review
CMS-1500	The standard form used by medical professionals to submit claims for reimbursements
Cohort 1, COH1	MTM program participants and non-participants for project year June 1, 2011 to May 31, 2012
Cohort 2, COH2	MTM program participants and non-participants for project year June 1, 2012 to May 31, 2013
Cohort 3, COH3	MTM program participants and non-participants for project year June 1, 2013 to May 31, 2014
COPD	Chronic Obstructive Pulmonary Disease
CPT	Current Procedural Terminology
CSA	Continuous Single-Interval Measure of Availability (an ACG adherence measure)
CY	Calendar Year
DiD	difference-in-difference
DUR	Drug Utilization Review
ED	Emergency Department
EQ	Evaluation Question
ESRD	End-Stage Renal Disease
ET	Evaluation Team

Acronym or Abbreviation	Explanation
FAMU	Florida A&M University
FSU COM	Florida State University College of Medicine
FY	Fiscal Year
GERD	Gastroesophageal Reflux Disease
HCBS	Home and Community-Based Services
HCPCS	Health Care Procedure Coding System
ICD or ICD-9	International Classification of Disease, Version 9 CM (Clinical Modification)
ICN	Internal Control Number
IOR	Incidence Odds Ratio
IP	Inpatient as in inpatient discharge or inpatient claim type
IRB	Institutional Review Board
IRR	Incidence Rate Ratio
LCL	Lower Confidence Interval Limit
LTC	Long-Term Care
LOE	Length of Enrollment
MAP	Medication Action Plan
MAS	Morisky Adherence Score
Max.	Maximum
MCAP	Medicaid Administrative Personnel
MCC	Multiple Chronic Conditions
MCO	Managed Care Organization
MED143	Contract between FSU COM and AHCA
MEDs-AD	Medicaid for Aged and Disabled. Florida's Section 1115 MEDs-AD Research and Demonstration (Project No. 11-W-00205/4).
MEG1	Medicaid eligible population number one. A category of persons eligible for Medicaid under the MEDs-AD Waiver.
Min.	Minimum
MMAS-8	Morisky Medication Adherence Scale 8-item
MPR	Medication Possession Ratio—an ACG medication adherence measure
MPY	Per Member per Year
MTM	Medication Therapy Management
MTM CCC	Medication Therapy Management Communication and Care Center
MTM-NP	Medication Therapy Management Non-Participants
MTM-P	Medication Therapy Management Participants

Acronym or Abbreviation	Explanation
N or No.	Number, as in number of recipients or events
OLS	Ordinary Least Squares regression, i.e., linear regression
OR	Odds Ratio
OTC	Over- the-Counter
OUT	Outpatient claim type
Participant	Any Medicaid recipient who participates in the MTM program intervention, i.e., has completed a CMR with the UF COP staff
PCP	Primary Care Physician
Pharm.	Pharmacy claim type
PMPY	Per Member Per Year
POS	Place Of Service
PQI	Prevention Quality Indicator, an AHRQ quality measure
PSA	Propensity Score Analysis
PSM	Propensity Score Matching
PY	Program Year, e.g., MTM PY 1, 2 and 3.
QFUR	Quarterly Follow-Up Review, e.g., QFUR3, QFUR6, QFUR9
RA	Research Assistant
RCT	Randomized Controlled Trial
recip./recipient(s)	Any person enrolled in Florida Medicaid
RIT	Research Investigative Team
RUB	Resource Utilization Band (an ACG measure)
SNF	Skilled Nursing Facility
SP	Study Period (pre-intervention, intervention, & post-intervention)
SPC	Specialty Care Physician
SP-INT or I	Study Period Intervention
SP-PRI	Study Period Pre-Intervention
Std. Dev. or STD	Standard Deviation
UB-04	Standard form used by facilities to submit claims for reimbursement
UCL	Upper Confidence Interval Limit
UF COP	University of Florida College of Pharmacy

Introduction

Purpose of this Report

This report summarizes the final findings of the pre-intervention period (prior to June 1, 2011) and the MEDs-AD Waiver (intervention) years (June 1, 2011 through May 31, 2014) for the evaluation of the Florida Medicaid Medication Therapy Management (MTM) intervention implemented by the University of Florida (UF) College of Pharmacy (COP). MTM services are not typically covered by Medicaid and the recipients included in this evaluation are adults that are often not eligible for Medicaid. Recipient eligibility for Medicaid and approval for the MTM program was achieved through a Section 1115 MEDs-AD Waiver approved by the Centers for Medicare and Medicaid Services. The waiver is referred to as the MEDs-AD Waiver in this document. Waivers under Section 1115 allow states flexibility to design and improve Medicaid programs by expanding coverage to individuals not otherwise covered by Medicaid and to provide services not typically available. The MEDs-AD Waiver defines three distinct populations. This evaluation only relates to a population designated in this report as MEG1. Eligibility criteria for the evaluated population includes individuals eligible for Medicaid, but not eligible for Medicare and who are eligible for, but not currently receiving: 1) long-term institutional care, 2) hospice services in the home or a facility, 3) home and community-based services (HCBS), or 4) recipients covered under a contract with a MCO. Eligibility criteria also include limits on the recipients' income and assets. This evaluation examines a new service provided to some MEG1 Florida Medicaid recipients: Medication Therapy Management.

This report includes findings based on combined or pooled data for the first three years of the current waiver for MTM program interventions beginning in 2011 (Year 1 Cohort 1), 2012 (Year 2 Cohort 2), and 2013 (Year 3 Cohort 3). MTM program participants are compared with Medicaid recipients who were members of the MEDs-AD Waiver population (MEG1), but either declined the opportunity to participate or were never contacted about the opportunity. The evaluation uses the latest available data for inpatient, outpatient, LTC, medical, and pharmacy claims for services received by recipients before May 31, 2014.   Claims submitted to the Florida Medicaid Agency and finalized as of September 2014 were included. Finalized claims received after September 2014 were not included in this analysis.

Claims and enrollment data used for this report are believed to represent nearly all Medicaid recipient utilization for the period January 1, 2010 to December 31, 2013 (last extracted on September 23, 2014) and utilization for the period January 1, 2014 to May 31, 2014. Claims for the period January 1, 2014 to

May 31, 2014 (last extracted on October 28, 2014) may be less complete since providers have a full year to submit claims to AHCA. Claims files are merged with demographic information found in the recipient demographic file, benefit plan file, assignment plan file, and the aid category file to determine periods of enrollment under the MEDs-AD Waiver and periods of excluded enrollment when recipients were enrolled in Medicare, above age 65 or below age 21, utilized HCBS, hospice services, or LTC services, received benefits through a MCO, or had no observable utilization. Enrolled days were calculated using the aid category file after exclusions. Descriptive and regression tables for the pooled analysis of Cohort 1, Cohort 2, and Cohort 3 for pre-intervention study period (SP-PRI) and intervention study period (SP-INT) are presented and contrasted with comparison groups defined later in the report.

Findings for the UF COP MTM process measures are also presented for Cohort 1, Cohort 2, and Cohort 3 using data provided by the UF COP MTM program.

The active intervention study periods for each cohort were: Cohort 1) June 1, 2011 to May 31, 2012, Cohort 2) June 1, 2012 to May 31, 2013, and Cohort 3) June 1, 2013 to May 31, 2014. Each SP-INT is preceded by a SP-PRI of 12 months in order to contrast MTM program metrics before and during the intervention, as well as by constructed comparison group(s) as deemed appropriate for each metric presented. Therefore, each cohort and comparison group was followed for up to two years as long as the recipients maintained eligibility under the MEDs-AD Waiver for the MEG1 population.

Background on the MTM Program and Evaluation

The goals of the MTM program were to improve the quality of care and prescribing practices based on best-practice guidelines, improve patient adherence to medication plans, reduce clinical risk, and lower prescribed drug costs and the rate of inappropriate spending for certain Medicaid prescription drugs for a high-risk population of Medicaid recipients eligible through Florida's Section 1115 MEDs-AD Research and Demonstration Waiver.

Recruitment of the Intervention Population

Selection of recipients covered by the waiver to participate in the intervention is a multistep process involving AHCA agency staff, UF COP (the MTM program provider), and consent at two points in time by targeted Medicaid recipients. Here the word "selection" refers to processes used by AHCA and UF COP that may be associated with which recipients end up in the intervention group. For example, calling recipients from a list of names sorted alphabetically might create different probabilities of being called

based on their ethnic background and therefore influence the opportunity to choose participation. AHCA does not actually "select" MTM participants rather recipients self-select into the intervention. Steps in the selection and intervention processes are as follows. Step 1: A list of recipients currently enrolled in the MEDs-AD MEG1 population was created by AHCA staff in the spring (March to May) before the start of each intervention year on June 1st. The number of recipients on this "original query" ranged from approximately 3,300 to 3,600 across the three cohorts. Efforts were made to screen ineligible recipients, e.g. Medicare beneficiaries, from the original query. Step 2: Pharmacy staff at the AHCA contacted recipients on the list to obtain consent for later telephone contact by UF COP. Beginning in June 2014 UF COP made these calls to obtain initial consent. The number of recipients giving consent at Step 2 ranged from approximately 650 to 850 across the three cohorts. Contact information for recipients giving consent was forwarded to the UF COP staff in order to schedule a Comprehensive Medication Review (CMR). Step 3: UF COP staff made telephone contact(s) with recipients, confirmed their continued interest and consent to participate, and scheduled a future telephone interview during the June to August period of each intervention year. Occasionally, CMRs were conducted during the scheduling telephone call. Step 4: Upon completion of the telephone CMR, recipients were designated as MTM-P. Recipients referred to UF COP by AHCA that did not complete a CMR were designated as MTM-NP and were used to construct two versions of comparison group one (CG1) with either lenient or strict inclusion/exclusion criteria. Step 5: Any problems identified by UF COP staff were discussed with the recipients and the CMR document and recommendations were typically faxed to each recipient's physician. A copy of the Medication Action Plan (MAP) was also sent to the recipient unless declined. Step 6: UF COP staff followed up with MTM program participants by telephone and/or review of electronic claims records at least every 90 days to identify resolution to previous recommendations and new problems. The intervention period ends May 31st of the year following the start of the intervention year.

Study Group Definitions and Size

The MEDs-AD Waiver MEG1 population at the core of this evaluation is a dynamic group with membership changing frequently due to new or lost eligibility under the waiver throughout the course of the observation period (June 1, 2010 through May 31, 2014). The evaluation design required a pre-intervention year observation period to contrast with intervention year metrics and identification of suitable comparison groups for each cohort and year. MEG1 population members were often observed across multiple study periods. They also were observed to transition in and out of the pool of recipients

eligible to be contacted by the AHCA pharmacy staff for referral to UF COP and in and out of the intervention group. Recipients who received the intervention at one point in time were identified and excluded from subsequent comparison groups. There were 21 Cohort 1 MTM-P recipients who also received the intervention with Cohort 2. Their Cohort utilization was excluded from this analysis. MEG1 recipients who were never exposed to the intervention may serve as a member of a comparison group in more than one study period. The analysis for combined Cohorts 1, 2, and 3 refined methods to more carefully define inclusion and exclusion criteria for both intervention (MTM-P) and comparison group recipients.

Therefore, a nomenclature for referring to various study groups, time periods, and comparison groups that forms the intervention and comparison group(s) for a given time period is desirable and is presented in Table 1.

Table 1 defines the study periods and cohort size for recipients referred to the UF COP for potential inclusion in the intervention. The initial study groups designated as MTM-P and MTM-NP for each cohort are the names of consenting recipients forwarded to the UF COP for potential selection into the MTM intervention. They are labeled as the "nominal" cohorts of size 651, 499, and 846 for each cohort, respectively. These cohorts are labeled as "nominal" because in truth, they only exist as a complete population of size "n" for a short period of time. The defined "nominal" cohorts begin shrinking in size due to lost eligibility almost immediately and additional losses continue throughout the intervention year. This is an artifact of the timing of the selection process beginning in the spring quarter before each intervention year starts (which is the 4th quarter of each cohort's SP-PRI) and is not completed until the CMR is completed by the UF COP by the beginning of the 2nd quarter of the intervention year. SP-PRI and SP-INT overlap as cohorts were observed over time for study periods one through four (Table 1).

Table 1. Overlapping enrollment periods and nominal cohort size for the Florida Medicaid MTM program evaluation, 2010 to 2014

Study Period Begin	Study Period End	Nominal Cohort 1	Nominal Cohort 2	Nominal Cohort 3	Nominal Comparison Group 2 Pool	Study Period
6/1/2010	5/31/2011	Pre-intervention Period			Comparison Group 2 Selection Pool	1
6/1/2011	5/31/2012	Intervention Period	Pre-intervention Period		Comparison Group 2 Selection Pool	2
6/1/2012	5/31/2013		Intervention	Pre-	Comparison	3

				Period	intervention Period	Group 2 Selection Pool	
6/1/2013	5/31/2014				Intervention Period	Comparison Group 2 Selection Pool	4
6/1/2014	5/31/2015						
Nominal Cohort Size		MTM-P + MTM-NP n = 651	MTM-P + MTM-NP n = 499	MTM-P + MTM-NP n = 846	Not MTM-P + MTM-NP N= 19,864		

In summary, the nominal cohorts listed in Table 1 represent the list of names sent by AHCA to the UF COP for each cohort and study period. The 19,864 recipients listed under the Nominal Comparison Group 2 column are persons enrolled in MEDs-AD Waiver MEG1 population at one or more points in time, but who were never contacted by AHCA staff and therefore, had no possibility of selection into the MTM intervention. The 19,864 recipients were the source for Comparison Group 2 (CG2) used in the propensity score analysis. The sum of nominal study groups (651 + 499 + 846 + 19,864) is 21,860 however; this is not the number of unique persons observed because some recipients were observed in more than one cohort as members of the MTM-NP population. The actual number of unique recipients followed for this evaluation was 20,707 persons with at least some MEDs-AD Waiver MEG1 population eligible in study period one to four.

Table 2 clarifies the issue of the study group nomenclature and the impact of attrition in defining both the MTM-P and MTM-NP (CG1) groups for the analysis. The nominal cohort sizes are listed in column one and two for the SP-PRI and SP-INT study periods. Lenient inclusion-exclusion criteria were applied in columns three and four. Strict inclusion-exclusion criteria were applied in columns five and six. Criteria were applied to each program year separately. Lenient criteria removed enrolled days when exclusionary criteria were observed. Strict criteria removed the entire program year when any exclusionary criteria were observed. The strict approach is more in keeping with published Medicaid research which typically restricts observation to recipients enrolled continuously for 12 month increments, but allows gaps of up to 45 days to be treated as continuous enrollment. Criteria were applied in the same manner to MTM-P and MTM-NP study group members. The last two rows of Table 2 demonstrate how severe the shrinkage is in this study population under both the lenient and strict exclusion approaches. The number of enrolled days by study group is presented later in this document.

Table 2. Nominal cohort size per the list of names transmitted to the UF COP before June 1st of each intervention year and the observed size by study period and cohort for the evaluation study after applying lenient and strict inclusion-exclusion criteria for the Florida Medicaid MTM program evaluation, 2010 to 2014

Study Population and Cohort	Nominal Study Population Size SP-PRI	Nominal Study Population Size SP-INT	Observed Study Population Size Lenient Criteria SP-PRI	Observed Study Population Size Lenient Criteria SP-INT	Observed Study Population Size Strict Criteria SP-PRI	Observed Study Population Size Strict Criteria SP-INT
	SP 1	SP 2	SP 1	SP 2	SP 1	SP 2
Cohort 1 MTM-P	147	147	129	72	77	44
Cohort 1 MTM-NP	504	504	458	227	259	250
Cohort 1 sub-total	651	651	587	299	336	294
	SP 2	SP 3	SP 2	SP 3	SP 2	SP 3
Cohort 2 MTM-P	171[a]	171[a]	123	73	82	51
Cohort 2 MTM-NP	324[b]	324[b]	238	132	131	88
Cohort 2 sub-total	495	495	361	205	213	139
	SP 3	SP 4	SP 3	SP 4	SP 3	SP 4
Cohort 3 MTM-P	137	137	111	46	24	7
Cohort 3 MTM-NP	709	709	569	280	66	26
Cohort 3 sub-total	846	846	680	326	90	33
	SP-PRI Total	SP-INT Total	SP-PRI Total	SP-INT Total	SP-PRI Total	SP-INT Total
Total MTM-P	455	456	363	191	183	102
Total MTM-NP	1,537	1,537	1,265	639	456	364

a. Includes 21 recipients who completed the intervention with Cohort 1 and Cohort 2 who were excluded from the pooled analysis.
b. Includes 22 recipients who completed the intervention with Cohort 1 and were excluded from the pooled analysis.

Table 3 lists the inclusion-exclusion criteria used to define the lenient and strict population definitions by the order in which there were applied.

- Step 1 removed claims and enrollment that occurred before the first study year or after the last evaluation study year.
- Step 2 potential MEDs-AD Waiver population members for this evaluation were identified using the AHCA Aid Category codes. This indicator captures recipients enrolled under all three eligibility categories.
- Step 3 and 4, persons with no observed utilization or who were outside the designated age range were removed.
- Steps 5-8 excluded persons based on factors that, by definition, made them ineligible for the MEDs-AD Waiver for this study population. These factors include: enrollment in Medicare or a Managed Care Plan or use of LTC, hospice services, or HCBS.
- Steps 9-11 excluded persons with no observed utilization or enrolled days during the study period, persons who were included in the MTM intervention in a previous time period, and persons who died during the study period. Inclusion and exclusion criteria were applied separately for each study year.

Table 3. Criteria and steps used to identify recipients for inclusion and exclusion from the evaluation study population (SP) for the Florida Medicaid MTM program evaluation, 2010 to 2014

Step	Inclusion-Exclusion Condition Type	Filtering Variable Applied by SP	Filtering Variable Source	Action Description	Domain	Why is Action Taken?
1	Exclude claims and enrollment for SP= 0 OR SP=5	SP Indicator	Created using date ranges for SP's	Exclude if SP indicator is (6/1/2010 to 5/31/2010) or (6/1/2014 to 5/31/2015	Study Design Require-ment for PRE-I & INT SPs	Keep all study periods equal to 12 months and remove enrollment outside of defined SP
2	MEDs-AD Waiver MEG1	Aid Category Inclusion	AHCA Program Codes	Include if present	Aid Category Inclusion	Identify potential MEG1 population members
3	No Utilization	Utilization Indicator by SP	Calculated amount of utilization by SP	Include if utilization >0	Utiliza-tion	Remove recipients with no utilization in SP
4	AGE <21 or >65	Age Category	Created using recipient date of birth and PY date ranges	Exclude if < 21 or > 64 at end of SP	Age	Very few <21 in sample; age > 64=Medicare eligibility
5	Medicare	Benefit Exclusion Category	AHCA Program Codes	Exclude Dual Eligibles	Medicare eligibility	Medicare in SP excludes recipients from MEDs-AD Waiver MEG1
6	HCBS	Aid	AHCA Program	Exclude if evidence of	Aid	HCBS in SP excludes

S t e p	Inclusion-Exclusion Condition Type	Filtering Variable Applied by SP	Filtering Variable Source	Action Description	Domain	Why is Action Taken?
		Category Exclusion	Codes	HCBS waiver enrollment	Category Exclusion	recipients from MEDs-AD Waiver MEG1
7	MCO	Assignment Plan Exclusion	AHCA Program Codes	Exclude if evidence of MCO enrollment (except for Primary Care Case Management)	Assign-ment Plan Exclusion	MCO in SP excludes recipients from MEDs-AD Waiver MEG1
8	LTC & Hospice UTIL	LTC Utilization Indicator	Utilization	Exclude if evidence of LTC in SP	LTC & Hospice POS Codes	LTC in SP excludes recipients from MEDs-AD Waiver MEG1
9	Death	Death Status	Calculated using date of death, SP dates	Exclude if died in SP and for future SPs	Death	Number of deaths is small
1 0	Previous Intervention	Cohort Study Group Categories	Identified 1st occurrence of MTM-P & excluding from future SPs	Exclude MTM-P recipients if observed in future SPs	Study Design Require-ment	Restrict MTM-P recipients to one PRE and INT SP
1 1	No MEDs-AD Waiver MEG1 Enrollment	Aid Category Inclusion	No observed enrollment	Exclude if MEDs-AD Waiver MEG1 enrollment in SP 1-4 is zero	Aid Category Inclusion	Utilization but no enrollment

Lenient and strict inclusion-exclusion criteria were also applied to the 19,864 recipients in the pool for CG2. The lenient and strict definitions for the CG2 pool populations are then used to select the CG2 membership by program year for use in the propensity score analysis. Propensity score matching further reduces the size of CG2 by study period based on the matching criteria employed. Nominal, lenient, and strict population definitions for the CG2 pool are presented in Table 4.

Table 4. Nominal, lenient, and strict definitions for the potential CG2 pool by study period for the Florida Medicaid MTM program evaluation, 2010 to 2014

Study Population and Cohort	Nominal CG2 Pool Population Size SP-PRI	Nominal CG2 Pool Population Size SP-INT	Observed CG2 Pool Population Size Lenient Criteria SP-PRI	Observed CG2 Pool Population Size Lenient Criteria SP-INT	Observed CG2 Pool Population Size Strict Criteria SP-PRI	Observed CG2 Pool Population Size Strict Criteria SP-INT
	SP 1	SP 2	SP 1	SP 2	SP 1	SP 2
Cohort 1 CG2	13,648	13,648	3,198	3,198	1,689	1,689
	SP 2	SP 3	SP 2	SP 3	SP 2	SP 3
Cohort 2 CG2	2,919	2,919	800	800	375	375
	SP 3	SP 4	SP 3	SP 4	SP 3	SP 4
Cohort 3 CG2	2,919	2,919	769	769	353	353
	SP-PRI Total	SP-INT Total	SP-PRI Total	SP-INT Total	SP-PRI Total	SP-INT Total
Total CG2	19,486	19,486	4,767	4,767	2,417	2,417

Intervention Processes

Trained staff from the UF COP conducts telephone interviews with willing Medicaid recipients. During the interview, a CMR is conducted as the first step in the intervention. A CMR collects patient specific information on prescription medications, potential medication related problems, and creates an action plan to resolve those problems. Based on findings from the CMR, UF COP staff may 1) send the patient a MAP that includes a medication list and may also include recommendations for behavioral change relevant to their condition and medication; and/or 2) send a facsimile to the recipient's primary care provider (PCP) with recommendations for changes in medication. Any given intervention for the recipient may include a MAP only, PCP FAX only, a MAP and a PCP FAX, or none of the post-CMR actions. Actions initiated are based on the pharmacist's expert opinion regarding over- or under-utilization of medication, medication interactions, or other issues related to the patient's treatment. Recommendations to the PCP may or may not be accepted and implemented by the prescriber. Subsequent to the CMR and post-CMR actions, participants are followed for an additional nine months. UF COP staff conducts reviews of patient medication claims records provided by the Pharmacy Benefit Management vendor for Florida Medicaid to determine if recommendations have been implemented or new problems have appeared. Occasionally, these three quarterly reviews lead to another patient or PCP contact.

Data Collection

Data collected on each participant for FY 2012-2013 and FY 2013-2014 was recorded by UF COP staff on customized Microsoft Excel spreadsheets. During FY 2014-2015, the UF COP introduced proprietary software designed specifically for the management of a population receiving MTM services.

The new system placed some constraints on what data was collected. For example, the Morisky Adherence Scale (MAS)[3] questions were not administered to Cohort 3 recipients. The new system also placed constraints on the content and format of information that could be exported outside the system. Therefore the information provided to the Florida State University College of Medicine (FSU COM) for this evaluation was not as detailed for Cohort 3.

Quantitative Study Evaluation Questions Addressed in this Final Report

Evaluation Questions (EQ) addressed in this report are listed in Table 5. Questions are similar to those posed for previous reports with the exception that the question on Medicaid providers was removed.

Table 5. Evaluation questions addressed in this report, Florida MTM program evaluation, 2010-2014

Evaluation Question Number	Evaluation Question
EQ 1	What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for utilization measures?
EQ 2	What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for expenditure measures?
EQ 3	What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for clinical outcomes?
EQ 4	What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for demographic categories?
EQ 5	What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), comparison group 1 (MTM-NP), and comparison group 2 for mortality and morbidity measures?
EQ 6	What are the differences in the pre-intervention and intervention periods within the intervention group for MTM process measures?

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[3] Morisky, D. E., Ang, A., Krousel-Wood, M., & Ward, H. J. (2008). Predictive validity of a medication adherence measure in an outpatient setting. J Clin Hypertens.(Greenwich.), 10(5), 348-354. An 8-item questionnaire administered by pharmacy staff to measure the adherence behaviors of patients.

Study Methods

Overall Study Design

This study used a retrospective observational examination with non-equivalent comparison groups of all Medicaid covered services for the Cohort 1, 2, and 3 study populations for the period June 1, 2010 through May 31, 2014 (48 months). The principal comparisons are for: 1) MTM-P versus MTM-NP (CG1) using lenient or strict inclusion-exclusion criteria that vary by metric and evaluation question. The MTM-NP group is advantageous for CG1 because everyone in the combined MTM-P and MTM-NP populations reached the 2nd stage of the consent process at the UF COP.

A second comparison group (CG2) was constructed for use with the propensity score matching method described below. Propensity score matching was used for EQ 2 measures with total reimbursement as the outcome. Propensity score matching was also used for selected binary outcome measures in EQ 1 to EQ 3 and EQ 5. The propensity score matched CG2 groups were constructed from the pool of potential CG2 recipients in Table 5.

EQ 4 and EQ 6 report only univariate and bivariate comparisons for the nominal MTM-P and MTM-NP populations and MTM process measures, respectively.

Data Sources and Preparation

Source data for this report include AHCA claims and recipient demographic files associated with Medicaid recipients in all three cohorts of the MEDs-AD Waiver MEG1 population. Claims and enrollment files for the years January 1, 2010 through May 31, 2014 were parsed into four time periods representing the pre-intervention year and intervention year for each cohort as depicted in Table 1. Claims were merged with enrollment and recipient demographic files for each time period and identified as MTM-P and MTM-NP as described in the report section above.

Berenson-Eggers Type of Service (BETOS) codes were assigned to procedure codes in the CMS-1500 professional service files http://www.cms.gov/Medicare/Coding/HCPCSReleaseCodeSets/BETOS.html. The BETOS code files include Health Care Procedure Coding System (HCPCS) procedure codes and the BETOS code to which each procedure code is assigned. The BETOS coding system was developed primarily for analyzing the growth in Medicare expenditures. The coding system covers all HCPCS codes; assigns a HCPCS code to only one BETOS code; consists of readily understood clinical categories (as opposed to statistical or financial categories); consists of categories that permit objective assignment; is

stable over time; and is relatively immune to minor changes in technology or practice patterns. Additional data sources utilized include the UF COP MTM participant list for Cohorts 1, 2, and 3, individual patient charts for Cohort 1 and Cohort 2, and quarterly reports for each intervention year provided to AHCA by the UF COP. Patient charts for Cohorts 1 and 2 were provided as individual Excel spreadsheets with 16 tabs for a variety of detailed content. Patient information for Cohort 3 was provided in five Excel files with information for all patients included on each tab. Demographic and process information were extracted from the UF COP files and merged with AHCA recipient demographic information. AHCA administrative claims data were provided to the FSU COM organized by facility (UB-04 standard claim form) and professional services (CMS 1500 standard claim form). The UB-04 facility data included short-term acute care hospital claims (Provider Type Code 01), other facility claims with various Provider Type Codes, and outpatient services provided by these same facilities. Separate CMS-1500 professional services claims were provided for pharmacy drugs dispensed, professional services by physicians and other professionals, and CMS-1500 waiver specific services. A dental services file was also received, but was excluded from these analyses. The CMS-1500 waiver services and UB-04 claims for facilities not labeled as Provider Type 01 were not available for previous reports under this evaluation. Claims were assigned to a study period based on the ending date of service and labeled by study group according to definitions previously described. Enrolled days by study period and study group were calculated using a standardized eligibility and episode reconciliation program available at: http://www.mini-sentinel.org/data_activities/toolkit_library/default.aspx.

The core regression models used to address EQ 1, 2, 3, and 5 for all three cohorts had a similar structure. Each Medicaid recipient was characterized by two records in the analytic data files representing utilization and enrolled days during the pre-intervention and intervention year. Each record summarized utilization, expenditures for inpatient, outpatient, pharmacy, HCPCS procedures, and individual binary indicators for one or more events of interest, e.g., inpatient hospitalization or emergency department (ED) encounters.

Quantitative Methods

Quantitative methods fall into three categories: 1) simple univariate and bivariate comparisons, 2) multivariable regression models using a difference-in-difference (DiD) analysis, and 3) propensity score models with various matching techniques and assumptions.

Univariate and Bivariate Comparisons

The analysis utilized simple univariate and bivariate comparisons for selected utilization, expenditure, and enrollment measures from Medicaid administrative data files with tests for statistical differences between defined groups using Chi-squared and t-tests, as appropriate, to compare proportions and means. EQ 4 and EQ 6, for demographic differences in the nominal population, and the UF COP process measures use only univariate and bivariate comparisons.

Multivariable DiD Models

Multivariable linear regression models with expenditures in dollars as the dependent variable used various linear regression approaches to model differences in reimbursement. Multivariable regression models for total procedures, length of stay, or other count measures used negative binomial models to account for the non-normal distribution of measures that are event counts. Multivariable logistic regression models for discrete binary events as the dependent variable are used to model outcomes such as one or more hospitalizations or other binary events. All multivariable models were adjusted for age, four race categories, gender, intervention versus pre-intervention period, intervention versus comparison study group, Johns' Hopkins University ACG© reference rescaled concurrent rate risk adjustment, death of a recipient, and length of enrolled (LOE) Medicaid days under the MEDs-AD Waiver.

EQ 1, 2, 3, and 5 were all addressed by using DiD analysis and the multivariable method appropriate for the dependent variable. In all cases, the test of the effect size on the intervention versus the comparison group was identified through an interaction term in the model that crosses group membership (MTM versus comparison) with time period (pre-intervention versus intervention periods). The coefficient on the interaction term is, therefore, the net effect of the intervention after accounting for different starting points in the pre-intervention period for the MTM intervention group as compared with designed comparison groups. Comparison groups are called non-equivalent because they were not chosen at random. However, every attempt was made to reduce differences in the characteristics of the MTM-P intervention group and the comparison groups chosen for each model. This was done via the inclusion-exclusion process and through propensity score matching.

Multivariable Propensity Score Models

Propensity score models were conducted for financial outcomes in EQ 2 and for selected binary outcomes in EQ 2 and EQ 3. Propensity score methods are elaborated below.

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Measure Transformation: Accounting for zero utilization and expenditures

There are three common interrelated issues with the analysis of health care expenditures. Insured persons have differing lengths of enrollment. This is typically approached by creating expenditure and other utilization data that are normalized as a rate per member per year (PMPY). This is accomplished by entering computed rates into the analysis or by entering the length of enrollment as a parameter in the equation. Persons with enrolled days, but no utilization, have an observed rate of zero expenditures or services utilized. This is sufficient for untransformed expenditures and in count models of service utilization. Service counts are typically analyzed using count models that accommodate zero utilization and make adjustments to the standard errors for persons with fewer than 100 events. As the number of events per person increases, the distribution asymptotically approaches normality and adjustments are not needed. Entering the length of enrollment as a variable constraint set to the value of one (1) yields incidence rate ratios that have attractive properties.

Log transformation is a mathematical technique for changing the scale of a measure by computing the natural logarithm of the value. The transformation does not change inferences made about the measure in multivariable models. It is a desirable approach for modeling expenditures because it shrinks the high expenditure outliers toward a more normal distribution. Persons with high expenditures and service counts typically have a long right side tail in their distribution; i.e., there is a large number of persons with no or moderate utilization and a smaller proportion with extremely large utilization in terms of dollars expended and number of services utilized. Log transformation can improve precision of multivariable estimates by reducing the standard errors and therefore, reducing uncertainty or the margin of error around an estimate.

However, log transformation cannot accommodate persons with zero utilization or expenditures because the log of zero is mathematically undefined. Persons with no utilization were dropped from the model. This tends to inflate the estimated utilization rates because persons with enrolled days are not included. One alternative was to assign an arbitrary level of utilization, e.g., one dollar, to persons with zero utilization so that they were retained in the model and their enrolled days were included.

The evaluation team constructed bivariate and multivariable models for total expenditures and log transformed expenditures in which persons with zero expenditures were assigned an arbitrary value of one dollar so that they were retained in the model and the overestimate of utilization rates were

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considered. Finally, when possible, the evaluation team applied robust standard error adjustments to account for remaining heteroscedasticity.

Risk Adjustment with John's Hopkins ACG System Software

The Johns Hopkins Adjusted Clinical Groups System (ACG) is a risk adjustment methodology that measures the morbidity burden of patient populations based on disease patterns, age, and gender. The ACG System is a statistically valid, diagnosis-based, case-mix methodology that allows healthcare providers, healthcare organizations, and public-sector agencies to describe or predict a population's past or future healthcare utilization and costs. It is based on diagnostic and/or pharmaceutical code information found in insurance claims or other computerized medical records.

The first step in the ACG assignment process was to categorize every International Classification of Disease (ICD-9-CM, 10, and 10-CM) diagnosis code given to a patient into unique morbidity groupings known as an "Aggregated Diagnostic Groups" (ADGs). ADGs are the building blocks of the ACG System. Each ADG is a group of ICD diagnosis codes that are similar with respect to specific clinical criteria and their demand on healthcare services. The ADG categories reflect the entire continuum of care. Each ADG is a grouping of diagnosis codes that are similar in terms of severity and likelihood of persistence of the health condition treated over a relevant period of time (such as a year of managed care enrollment). Diagnosis codes within the same ADG are similar in terms of both clinical criteria and expected need for healthcare resources. Just as individuals may have multiple diagnosis codes, they may have multiple ADGs (up to 32). ADGs are distinguished by clinical characteristics (e.g., medical/specialty/pregnancy, physical health/psycho-social), and degree of refinement of the problem (diagnosis or symptom/sign) and are not categorized by organ system or disease. Instead, they are based on clinical dimensions that help explain or predict the need for healthcare resources over time. The need for healthcare resources is primarily determined by the likelihood of the persistence of problems and their level of severity rather than organ system involvement.

ADGs are then mapped into ACG groups (up to 94) which are groups of individuals with similar needs for healthcare resources who also share similar clinical characteristics. ACGs are a series of mutually exclusive health status categories defined by morbidity, age, and gender. They are based on the premise that the level of resources necessary for delivering appropriate healthcare to a population is correlated with the illness burden of that population. ACGs are used to determine the morbidity profile of patient populations to more fairly assess provider performance, to reimburse providers based on the health

needs of their patients, and to allow for more equitable comparisons of utilization or outcomes across two or more patient or enrollee aggregations. Research has shown that the clustering of morbidity for risk adjustment-purposes, the methodology used by the ACG System, is a better predictor of health services resource use than the presence of specific diseases. The result is that individuals within a given ACG have experienced a similar pattern of morbidity and resource consumption over the course of a given year.

While ACGs were designed to represent clinically logical categories for persons expected to require similar levels of healthcare resources, enrollees with similar overall utilization may be assigned different ACGs because they have different epidemiological patterns of morbidity. To simplify the analysis of a population's need for healthcare resources, the ACG System automatically maps ACGs into a six-level (low to high) morbidity category termed Resource Utilization Bands, or RUBs. The six RUBs are formed by combining the ACG mutually exclusive cells that measure overall morbidity burden. RUB designations are: 0 – Non-Users, 1 – Healthy Users, 2 – Low, 3 – Moderate, 4 – High, and 5 – Very High.

The John's Hopkins University ACG System computes three types of risk adjustment weights: local concurrent weights, reference rescaled weight, and reference unscaled weight. The local concurrent weight is assigned to a patient based upon their ACG analysis using local cost data. The local weight for each recipient is calculated as the simple average total cost of all individuals assigned to a study group in a given study period. Local weights are calibrated to reflect the unique properties of the local population and do not make use of national norms. The reference rescaled weight is rescaled so that the mean across the study group is 1.0. Rescaling facilitates internal comparisons of morbidity burden between different study groups based on a national reference population. The reference unscaled weight is an estimate of concurrent resource use associated with a given ACG based on the ACG reference database and is expressed as a relative value. The reference unscaled weight is based on the recipient's ACG score. The reference unscaled weight is useful in drawing external comparisons between the local population's morbidity burden and that of the national reference database. Each recipient is assigned all three weights by the ACG system.

For all weights, scores greater than 1.0 indicate that the recipient's disease burden is higher than the reference population while scores less than 1.0 indicate less disease burden. Regression models included in this evaluation include the ACG reference rescaled weight. All three ACG weights are employed in the propensity score analysis described below.

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The ACG System also reports two population based measures of adherence to drug regimens: The Medication Possession Ratio (MPR) is calculated as the total number of days medication is dispensed (excluding final prescription) divided by the total number of days between the first and last prescription. Continuous, Single-interval Measure of Medication Availability (CSA) is calculated as the days medication was supplied divided by days until the next prescription averaged for each prescription. The values for MPR and CSA range from zero (low adherence) to 1.0 (perfect adherence). Values of 0.80 and above are considered optimal levels of adherence. The two ratios are calculated by study period and summarize adherence for up to 17 chronic conditions tracked by the ACG System.

Propensity Score Methods for Comparison Group 2

The fundamental question in evaluating any program is whether the designed intervention has been effective in accomplishing its primary objective. A well-designed program will have an intervention (or "treatment") that clearly articulates the intervention's desired outcome. In many situations, however, the design of the program and the resulting data does not come from a randomized trial, but comes, instead, from a non-randomized or observational study.

Statisticians have long understood that the non-random assignment of subjects into treatment and control groups can cause the estimation of the treatment effect to be biased due to a variety of confounding factors, such as sample bias. Sample bias can arise, for example, when individuals who do respond to requests to be enrolled in the program have different baseline characteristics than those who do not respond.

In a randomized controlled trial, which is considered the gold standard for estimating the effects of treatments, individuals are randomized into treatment and control groups. Randomization ensures that the treatment effects will not be confounded with either measured or unmeasured baseline characteristics of the individuals provided that the number of randomized participants is large enough to minimize random variations. Therefore, an unbiased effect of the treatment can be estimated by comparing outcomes directly between treated and untreated subjects by using standard statistical tests such as t-tests, regression analysis, ANOVA, chi-squared tests, etc.

In observational studies, since treatment allocation is not randomized, treated and non-treated groups may differ considerably in their pre-treatment characteristics and this may seriously hamper the validity of the statistical tests and their conclusions. Consider, for example, a voluntary job re-training program for the unemployed, whose outcome is a measure of the difference in annual earnings between pre-

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and post-training intervention. For this type of intervention, voluntary participation is typically solicited from a large pool of the unemployed, but the program is able to accommodate a relatively small number of participants. A problem in the successful evaluation of the effects of the program is to find non-participants in the same or similar labor market who "look like" the program participants in order to match them on baseline characteristics. This phenomenon is known as "the counterfactual" and the goal is to answer the question, "What would have happened to those who, in fact, did receive treatment, if they had not received treatment (or the converse)?" The main challenge of a credible impact evaluation is the construction of the counterfactual outcome, that is, what would have happened to participants in the absence of treatment? Since this counterfactual outcome is never observed, it has to be estimated using statistical methods.

Propensity score analysis (PSA), also known as propensity score matching (PSM), was developed to answer these questions. The propensity score is defined as the probability that an individual in the combined sample of treated (MTM-P) and untreated (MEG1-CG2) individuals is equally likely to have been selected into the selection pool of recipients forwarded to the UF COP. The propensity score is a multivariable model where pre-treatment characteristics and known potential confounders are included in the model as predictors and where the outcome is selection into the treatment group (MTM-P). Therefore, the propensity score is the probability of each person in the MEG1-CG2 included in the MTM-P given the observed pre-treatment characteristics. PSAs can then be used in a number of ways, including matching or stratification. Matching and stratification are generally preferred as they create a quasi-randomized study design whereby two participants, one in each group with similar propensity scores, can be assumed to have been equally likely to have been selected into the comparison or treatment group. PSA does not take into account unmeasured or unobservable characteristics of recipients that might influence their selection into each group.

The PSAs were run using the Stata statistical software package. The evaluation team conducted the PSAs on two important financial outcomes, total cost and total pharmacy costs. A series of PSAs was run on both the MTM-P group's pharmacy and total costs with various combinations of PSA algorithms, two of the three ACG risk adjustment weights and lenient and strict population definitions. The first set of 12 PSAs was performed using pharmacy costs as the outcome variable and included adjustments for gender and age in a base model and then year and length of enrollment and year alone for the lenient and strict population definitions in turn. The second set of 12 PSAs was performed using total costs as the outcome and the same iteration of models as used for pharmacy costs. The evaluation team conducted

24 propensity score estimates of pharmacy and total costs savings for the first three cohorts of the MTM program provided in this analysis in order to test the sensitivity of the estimates to the various assumptions underlying each of the PSA algorithms and ACG weight calculations.

In addition to analysis of pharmaceutical expenditures and total cost expenditures by individuals enrolled in the MEDs-AD Waiver program versus non-enrollees, we also performed an analysis of inpatient admissions and ED visits for MEDs-AD Waiver recipients and non-recipients. The statistical technique used in this analysis was PSA, as this methodology allows a comparison of individuals based on their similarity of age, length of program enrollment, and other relevant factors potentially affecting both inpatient and emergency room usage.

Similar to the pharmaceutical and total cost analyses, three different sets of PSAs, each set containing two models, were run for both inpatient admissions and emergency room visits on both the 'lenient' and 'strict' data which yielded a total of 24 models. The first set of PSAs was performed using inpatient admissions as the outcome variable and with gender, age, and a risk adjusted weight variable derived from the John's Hopkins ACG system. This variable, the local weight, is a concurrent weight assigned to a patient based upon their ACG analysis using local cost data. The local weight for each ACG is calculated as the simple average total pharmacy cost of all individuals assigned to each category. Local weights are calibrated to reflect the unique properties of the local population and do not make use of national norms. The second model in the first set also uses gender and age, but replaces the local weight with the reference rescaled weight, also derived from the ACG analysis, which is a rescaling of the local weight so that the mean across the population is 1.0. Rescaling facilitates internal comparisons of morbidity burden, based on reference population and between different subpopulations. The second set of models employs the same covariates as the first set, but also adds the individual's length of enrollment in the MEDs-AD Waiver program in addition to the year of participation. The final set of models is similar to the second set, but drops the individual's length of enrollment. In addition, each set of models was run separately on the 'lenient' and 'strict' data which were described previously.

Quantitative Findings

This section presents the interpretation of the quantitative findings. Tables for the quantitative findings may be found in the Quantitative Tables Appendix.

Enrolled Days—Application of Inclusion and Exclusion Criteria

Enrolled days are included in all regression models to adjust for differences in the length of enrollment of the MTM-P and MTM-NP comparison groups over time. Coefficients for enrollment in these models are constrained to equal one and are not shown in the regression model tables. Enrolled days are also included as the denominator in descriptive tables for counts of services or events and reimbursed amounts. Enrolled days for each population and time period are shown in these tables.

Enrolled days in Medicaid for the entire universe of recipients considered for inclusion in the evaluation are presented in Table 6. This table includes all 20,696 recipients with any observable enrollment tracked by the evaluation team from January 1, 2010 through May 31, 2014 including the MTM-P and MTM-NP study groups and the entire pool of recipients eligible for selection into the CG2 population before any inclusion or exclusion criteria were applied. A small number of persons tracked (20,707-20,696=11) had no observable enrollment during this time period.

Table 7 presents the enrolled days by study group for the MTM-P and MTM-NP (CG1) population by study period for the four study years that Cohorts 1, 2, and 3 were tracked after application of the lenient (Table 7) inclusion/exclusion criteria. There were 1,265 and 363 persons in the MTM-NP and MTM-P study groups, respectively, during the pre-intervention period, but only 639 (MTM-NP) and 191 (MTM-P) persons remained for the intervention period. Mean enrollment for the lenient population definition was somewhat higher, but not statistically different in the intervention year than the pre-intervention year and the MTM-P enrolled days were higher than the MTM-NP enrollment during pre-intervention periods (p<.05), but not during the intervention year period.

Strict population definitions in Table 8 began with 413 and 152 recipients in the MTM-NP and MTM-P study groups, respectively, during the pre-intervention year and 307 (MTM-NP) and 133 (MTM-P) were retained for the intervention year. No statistically significant differences between study groups or periods in enrolled days were identified under the strict population definition. The reduction in persons retained for study in the strict definition resulted in 335,806 total enrolled days of observation as opposed to the 768,561 total enrolled days observed under the lenient definition.

Quantitative findings for EQ1 through EQ6 follow and are organized by consecutive table numbers 9 to 56. Key findings presented as bullets underneath each table name and number.

EQ 1: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG1 (MTM-NP), and CG 2 for utilization measures?

Interpretation of Descriptive Tables EQ 1-BETOS Codes

Descriptive findings for EQ 1 and EQ 2 are summarized together in the EQ 1 section for efficiency in presentation. Table 9 presents outpatient facility procedures and Table 10 professional service procedures. Both tables use the LENIENT population definition. The number of services or events (EQ 1) described in each table are presented along with the reimbursed amount (EQ 2) associated with those services by study group and study period. Professional and outpatient hospital services are summarized by seven BETOS codes. Brief comments about the findings follow:

Table 9. Total and mean service counts and dollars for UB-04 outpatient facility claims by BETOS codes adjusted for enrolled days by claim type and by program period for MTM-P and MTM-NP population groups using LENIENT inclusion/exclusion criteria, Florida MTM program June 1, 2010 - May 31, 2014

- Mean annualized reimbursement amount for all BETOS procedures is lower for the intervention year ($1,961) than the pre-intervention year ($2,288) for both groups. The mean decline between periods was $255 for MTM-P and $271 for MTM-NP. The difference is not statistically significant.
- Overall, mean reimbursement is lower for the MTM-P ($1,956) than the MTM-NP ($2,186). The difference is not statistically significant.
- Many of these records were coded as missing because they included no Current Procedural Terminology (CPT) codes.

Table 10. Total and mean professional services counts and dollars for CMS-1500 professional service claims by BETOS codes adjusted for enrolled days by program period for MTM-P and MTM-NP population groups using LENIENT inclusion/exclusion criteria, Florida MTM program June 1, 2010 - May 31, 2014

- Mean annualized reimbursement amount for all BETOS procedures is lower for the intervention year ($5,659) than for the pre-intervention year ($6,947) for both groups. The mean decline between periods was $2,234 for MTM-P and $1,004 for MTM-NP. The difference is not statistically significant.

- Overall, reimbursement is higher in MTM-NP ($6,650) than MTM-P ($5,946), but the difference is not statically significant.

- BETOS codes for the Tests category were the most numerous in the professional services file. Evaluation and Management codes were associated with the highest total reimbursement amounts.

Table 11. Total inpatient facility discharges and the mean amount reimbursed per discharge adjusted for enrolled days by program period for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The mean annualized amount reimbursed for inpatient care per recipient is higher for the MTM-NP in both the the pre-intervention period ($25,181 vs. $16,614) and intervention period ($14,205 vs. $13,093) with respect to the MTM-P group .

- Overall, the mean reimbursed amount for inpatient care is higher for the MTM-NP ($22,997) than the MTM-P ($15,756).

- The decline in mean reimbursed amount from pre-intervention to intervention period was larger in MTM-NP ($10,975) than in MTM-P ($3,521).

- None of the differences were statistically signficant.

Table 12. Total inpatient facility discharges and the mean amount reimbursed per discharge adjusted for enrolled days by program period for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The mean annualized amount reimbursed for inpatient care per recipient is higher for the MTM-NP in both the the pre-intervention period ($209,842 vs. $122,319, p<.05) and intervention period ($57,684 vs. $52,220) with respect to the MTM-P group.

- Overall, the mean reimbursed amount for inpatient care is higher for the MTM-NP than the MTM-P ($139,188 vs. $92,742, p<.05).

- The decline in mean reimbursed amount from pre-intervention to intervention period was larger in MTM-NP than in MTM-P ($152,158 vs. $70,099, p<.05).

- All differences were statistically significant.

Table 13. Mean inpatient days among recipients with one or more inpatient stays by program period for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- On average, the MTM-NP spent more days in an inpatient facility (12.5 days) than the MTM-P (9.4) but the difference was not statistically significant.
- Average days in an inpatient facility are higher in the pre-intervention period (11.9 days) than the intervention period (9.1 days) for both groups but the difference was not statistically significant.

Table 14. Mean inpatient days among recipients with one or more inpatient stays by program period for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- On average, the MTM-NP spent more days (7.2 days) in an inpatient facility than the MTM-P (6.8 days) but the difference was not statistically significant.
- Average days in an inpatient facility are lower in the pre-intervention period (7.0 days) than the intervention period (7.3 days) for both groups, but the difference was not statistically significant.

Table 15. Total and mean prescription counts and amount reimbursed adjusted for enrolled days by program period for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

Prescription Counts EQ 1 and Pharmacy Reimbursement EQ 2
- The mean number of prescriptions per recipient is greater for the MTM-P (49 pre-intervention) than the MTM-NP (45 pre-intervention) for each program year and overall (MTM-P 52 vs. MTM-NP 48), but the differences were not statistically significant.
- The mean annualized reimbursement rate per recipient was higher in the MTM-P than in MTM-NP during the pre-intervention period ($4,514 vs. $4,005) and was higher in the MTM-P than in MTM-NP during the intervention period ($6,738 vs. $5,373). None of the differences were statistically significant although the mean amount reimbursed during the intervention year was $1,365 higher in MTM-P.

Table 16. Total and mean prescription counts and amount reimbursed adjusted for enrolled days by program period for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

Prescription Counts EQ 1 and Pharmacy Reimbursement EQ 2

- The mean number of prescriptions per recipient was similar for the MTM-NP (61 pre-intervention) and the MTM-P (59 pre-intervention). These numbers were similar to the overall (MTM-NP 62 vs. MTM-P 61). None of the differences were statistically significant.
- The mean annualized reimbursement rate per recipient was lower in MTM-P than in MTM-NP during the pre-intervention period ($5,274 vs. $6,963) and was higher in the MTM-P than in MTM-NP during the intervention period ($5,596 vs. $4,913). None of the differences were statistically significant although the mean amount reimbursed during the intervention year was $683 higher in MTM-P.

Interpretation of Regression Tables EQ 1

Table 17. General Estimating Equation negative binomial model estimates and p-values for total CPT/HCPCS procedure codes in the CMS-1500 professional claims and the UB-04 outpatient claims files for the LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.
- Gender is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests that there are a greater number of claims for females in reference to males.
- Intervention year is significant in the base and DiD models at a 0.05 significance level. The negative coefficient suggests that there are a lower number of claims for in the intervention year in reference to the pre-intervention year.
- Death is significant in the base and DiD models at a 0.05 significance level. The negative coefficient suggests that there are a lower number of claims for those that died in reference to those that did not.
- The coefficients on age and ACG risk weight variables are positive and significant in both base and interaction models at $p < 0.05$ significance level indicating that both are positively associated with higher total procedures. However, the effect of age is small in this model.

Table 18. General Estimating Equation negative binomial model estimates and p-values for total CPT/HCPCS procedure codes in the CMS-1500 professional claims and the UB-04 outpatient claims files for the STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.
- Gender is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests that there are a greater number of claims for females in reference to males.
- The coefficients on age and ACG risk weight variables are positive and significant in both base and interaction models at $P< 0.05$ significance level indicating that both are positively associated with higher total procedures. However, the effect of age is small in this model.

Table 19. General Estimating Equation negative binomial model estimates and p-values for total inpatient facility and emergency department events for the LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups, gender groups, or race groups.
- Study period is significant in both base and DiD models at a 0.05 significance level. The negative coefficient suggests that there are fewer inpatient facility and ED events during the intervention period in reference to the pre-intervention period.
- Death is significant in both base and DiD models at a 0.05 significance level. The negative coefficient suggests fewer inpatient facility and ED events for those that died in reference to those that did not.
- The coefficient on the ACG risk weight variable is positive and significant in both base and interaction models at $P< 0.05$ significance level indicating that burden of illness is positively associated with higher total emergency department events.
- The coefficient on the age variable is negative and significant in both base and interaction models at $P< 0.05$ significance level indicating that age is negatively associated with higher total emergency department events.

Table 20. General Estimating Equation negative binomial model estimates and p-values for total inpatient facility and ED events for the STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups, gender groups, or race groups.
- Study period is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests more inpatient facility and ED events during the intervention period in reference to the pre-intervention period.
- The coefficient on the ACG risk weight variable is positive and significant in both base and interaction models at $P < 0.05$ significance level indicating that burden of illness is positively associated with higher total combined emergency department and inpatient events.
- The coefficient on the age variable is negative and significant in both base and interaction models at $P < 0.05$ significance level indicating that age is negatively associated with higher total emergency department and inpatient events.

Table 21. General Estimating Equation negative binomial model estimates and p-values for total outpatient prescriptions for the LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups or people who died.
- Gender is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests more outpatient prescriptions for females in reference to males.
- The Black or African American group is significant in both base and interaction models at a 0.05 significance level. The negative coefficient suggests fewer outpatient prescriptions in reference to the White or European American group.
- Study period is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests more outpatient prescriptions during the intervention period in reference to the pre-intervention period.
- The coefficients on age and ACG risk weight variables are positive and significant in both base and interaction models at a 0.05 significance level indicating that both are positively associated with higher total prescriptions. However, the effect of age is small in this model.

Table 22. General Estimating Equation negative binomial model estimates and p-values for total outpatient prescriptions for the STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups, race groups, or study period.
- Gender is significant in both base and DiD models at a 0.05 significance level. The positive coefficient suggests more outpatient prescriptions for females in reference to males.
- The coefficients on age and ACG risk weight variables are positive and significant in both base and interaction models at a 0.05 significance level indicating that both are positively associated with higher total prescriptions. However, the effect of age is small in this model.

EQ 2: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG1 (MTM-NP), and CG2 for expenditure measures?

Interpretation of Descriptive Tables EQ 2
See description under EQ 1

Interpretation of Regression Tables EQ 2

Total Reimbursement
Table 23. Robust log-level linear regression DiD model estimates and p-values for a model of total recipient expenditures for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model without interaction found no difference between study groups, but both groups had lower average reimbursement during the intervention year as compared to the pre-intervention year.
- The DiD models for total reimbursement suggest no difference between the two groups.
- Intervention year is significant in both base and interaction models at a 0.05 significance level. The negative coefficient suggests that expenditure was lower in the intervention year in reference to the pre-intervention year.
- Death is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that expenditure was higher for those that died in reference to those who did not.
- ACG risk weight variable is significant in both base and interaction models at a 0.05 significance level indicating increased disease burden is associated with higher total expenditures.

Table 24. Robust log-level linear regression DiD model estimates and p-values for a model of total recipient expenditures for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model without interaction found no difference between study groups, but both groups had lower average reimbursement during the intervention year as compared to the pre-intervention year.
- The DiD models for total reimbursement suggest no difference between the two groups.
- ACG risk weight variable is significant in both base and interaction models at a 0.05 significance level indicating increased disease burden is associated with higher total expenditures.

Pharmacy Reimbursement

Table 25. Robust log-level linear regression DiD model estimates and p-values for a model of total recipient pharmacy expenditures for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD models for total reimbursement for pharmacy prescriptions suggest there is a difference between the two study groups. Expenditure is greater for the MTM-P in reference to MTM-NP.
- Gender variable is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that expenditure was higher for females in reference to males.
- Intervention year is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that expenditure was higher in the intervention year in reference to the pre-intervention year.
- ACG risk weight variable is significant in both base and interaction models at a 0.05 significance level indicating increased disease burden is associated with higher total pharmacy expenditures.

Table 26. Robust log-level linear regression DiD model estimates and p-values for a model of total recipient pharmacy expenditures for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model without interaction found no difference between study groups, but both groups had lower average reimbursement during the intervention year as compared to the pre-intervention year.
- The DiD model for total reimbursement suggests no difference between the two groups.

- ACG risk weight variable is significant in both base and interaction models at a 0.05 significance level indicating increased disease burden is associated with higher total pharmacy expenditures.

Propensity Score Models for Total Reimbursement and Pharmacy Reimbursement

Three different sets of PSAs, each set containing two models, were run for both pharmaceutical and total costs on both the 'lenient' and 'strict' data for a total of 24 models. The first set of PSAs was performed using pharmacy costs as the outcome variable and with gender, age, and a risk adjusted weight variable derived from the John's Hopkins ACG system. This variable, the local weight, is a concurrent weight assigned to a patient based upon their ACG analysis using local cost data. The local weight for each ACG is calculated as the simple average total pharmacy cost of all individuals assigned to each category. Local weights are calibrated to reflect the unique properties of the local population and do not make use of national norms. The second model in the first set also uses gender and age, but replaces the local weight with the reference rescaled weight, also derived from the ACG analysis, which is a rescaling of the local weight so that the mean across the population is 1.0. Rescaling facilitates internal comparisons of morbidity burden, based on reference population and between different subpopulations. The second set of models employs the same covariates as the first set, but also adds the individual's length of enrollment in the MEDs-AD Waiver program in addition to the year of participation. The final set of models is similar to the second set, but drops the individual's length of enrollment. In addition, each set of models was run separately on the 'lenient' and 'strict' data which were described previously.

Table 27. Propensity score models for pharmaceutical reimbursements for LENIENT and STRICT MTM-P and CG 2, Florida MTM program June 1, 2010 - May 31, 2014

- The results show that there was no statistically significant difference in pharmacy costs between the MTM-P and the comparison group for any of the PSA models.
- The sign of the average treatment effect suggests lower pharmacy costs for MTM-P in some models and higher pharmacy costs in other models although none reach statistical significance.

Table 28. Propensity score models for total reimbursements for LENIENT and STRICT MTM-P and CG 2, Florida MTM program June 1, 2010 - May 31, 2014

- The results are similar to the pharmacy cost PSA model results in that there was no statistically significant difference in total cost expenditures between the MTM-P group and the comparison group (CG2) for any of the PSA models except for one model using the 'lenient' dataset, the

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rescaled weight, and the year of participation as covariates. Average treatment effect in that model suggests the MTM-P group was $5,283 lower than the MTM-NP group.

- This result is likely a statistical anomaly for two reasons:
    - The results for the similar model with the local weight variable were not statistically significant and statistical theory shows that the simple rescaling of a variable, while affecting the magnitude of the variable's association with the outcome, should have no effect on its statistical significance.
    - The lack of association for the model including length of enrollment, which should be, a priori, a factor associated with total cost was not statistically significant.

In conclusion, therefore, the results of the PSA models for both pharmacy and total cost expenditures show no statistically significant difference for those who did, or did not, participate in the MEDs-AD Waiver program. We caution, however, that the number of participants in the program was relatively small and that attrition also occurred over the program's duration. It is highly likely that a MTM program with more participants, and whose participation remains stable over the program period, would show significant benefits not only in pharmaceutical and total healthcare cost reductions, but also an improvement in the health outcomes of the participants.

EQ 3: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG1 (MTM-NP), and CG2 for clinical outcomes?

Interpretation of Descriptive Tables EQ3

Table 29. Mean Continuous Single-Interval Measure of Availability (CSA) medication adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- CSA values are similar in the MTM-P and MTM-NP groups in all study periods.

Table 30. Mean Continuous Single-Interval Measure of Availability (CSA) medication adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying STRICT inclusion and

exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- CSA values are similar in the MTM-P and MTM-NP groups in all study periods.

Table 31. Mean Medication Possession Ratio (MPR) adherence score the 17 chronic conditions tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- MPR values are similar in the MTM-P and MTM-NP groups in all study periods.

Table 32. Mean MPR adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- MPR values are similar in the MTM-P and MTM-NP groups in all study periods.

Interpretation of Regression Tables EQ3

Table 33. Logistic regression model estimates and p-values for odds of one or more discharges from an inpatient hospital for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.
- Intervention year is significant in both base and interaction models at a 0.05 significance level. The negative coefficient suggests that there are lower odds of one or more discharges from an inpatient hospital in the intervention year in reference to the pre-intervention year.
- Death is significant in both base and interaction models at a 0.05 significance level. The negative coefficient suggests that there are lower odds of one or more discharges from an inpatient hospital for those that died in reference to those who did not.
- Age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating disease burden is positively associated with increased odds of an inpatient discharge.

Table 34. Logistic regression model estimates and p-values for odds of one or more discharges from an inpatient hospital for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.

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- The non-African American/non-Hispanic (i.e., Other) group is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that there are higher odds of one or more discharges from an inpatient hospital for this group in reference to White and European Americans.

- ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating disease burden is positively associated with increased odds of an inpatient discharge.

Table 35. Logistic regression model estimates and p-values for odds of one or more discharges from a hospital ED for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.

- Gender is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that there are higher odds of one or more discharges from a hospital ED for females in reference to males.

- Age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating disease burden is positively associated with increased odds of an emergency depart visit.

Table 36. Logistic regression model estimates and p-values for odds of one or more discharges from a hospital ED for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.

- Gender is significant in both base and interaction models at a 0.05 significance level. The positive coefficient suggests that there are higher odds of one or more discharges from a hospital ED for females in reference to males.

- Age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating disease burden is positively associated with increased odds of an emergency depart visit.

Table 37. Logistic regression model estimates and p-values for odds of one or more U.S. Agency for Healthcare Research and Quality (AHRQ) Ambulatory Care Sensitive Condition (ACSC) discharges from an inpatient hospital for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.

- ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating disease burden is positively associated with increased odds of a discharge for an ACSC.

Table 38. Logistic regression model estimates and p-values for odds of one or more AHRQ ACSC discharges from an inpatient hospital for STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.

- There are no significant covariates in either model.

Table 39. Propensity score model for one or more inpatient hospital discharges for LENIENT and STRICT MTM-P and CG2, Florida MTM program June 1, 2010 - May 31, 2014

- The results show that there was no statistically significant difference in inpatient admissions between the MTM-P and CG2 for any of the PSA models.

- However, the coefficients are negative indicating the direction of change was toward fewer inpatient discharges.

Table 40. Propensity score model for one or more emergency department events for LENIENT and STRICT MTM-P and CG2, Florida MTM program June 1, 2010 - May 31, 2014

- The PSA model results suggest there was no statistically significant difference in ED visits between the MTM-P and CG2 for any of the PSA models.

EQ 4: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG1 (MTM-NP), and CG2 for demographic categories?

Interpretation of Descriptive Tables EQ 4 for the Nominal, LENIENT, and STRICT Cohort Definitions

Table 41. Frequency and proportion of patients categorized by age on the last day of the pre-intervention study period in NOMINAL Cohorts 1, 2, and 3 for the MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

MTM-P

- The proportion of people in the 41-50 years age group is significantly lower in Cohort 2 than in Cohort 1.

- The proportion of people in the 61-65 years age group is significantly larger in Cohort 2 and in Cohort 3 than in Cohort 1.
- The proportion of people in the 56-60 years age group is significantly lower in Cohort 3 than in Cohort 1.
- There does not appear to be a significant difference of proportion by age group between Cohorts 2 and 3.

MTM-NP

- The proportion of people in the 61-65 years age group is significantly lower in Cohort 2 and Cohort 3 than in Cohort 1.
- The proportion of people in the 41-50 years age group is significantly lower in Cohort 1 than in Cohort 2.
- The proportion of people in the 51-55 years age group is significantly lower in Cohort 1 and Cohort 2 than in Cohort 3.
- The proportion of people in the 21-40 years age group is significantly lower in Cohort 1 and Cohort 3 than in Cohort 2.
- The proportion of people in the 0-20 years age group is significantly lower in Cohort 3 than in Cohort 2.
- The proportion of people in the 56-60 years age group is significantly lower in Cohort 2 than in Cohort 3.

Table 42. Frequency and proportion of patients categorized by race and ethnicity in NOMINAL Cohorts 1, 2, and 3 initial study population for the MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

MTM-P

- The proportion of the Black or African American race group is significantly lower in Cohort 1 than in Cohort 2.
- The proportion of the White or European American race group is significantly higher in Cohort 1 than in Cohort 2.
- The proportion of the Hispanic race group is significantly lower in Cohort 1 than in Cohort 3.
- There does not appear to be a significant difference in proportion by race between Cohorts 2 and 3.

MTM-NP

- The proportion of the "Other" group is significantly lower in Cohort 1 than in Cohort 3.

- There does not appear to be a significant difference in proportion by race between Cohorts 2 and 3.

Table 43. Frequency and proportion of patients categorized by gender in NOMINAL Cohorts 1, 2, and 3 initial study population for the MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 – May 31, 2014

MTM-P

- There does not appear to be a significant difference in proportion by gender between Cohorts 1, 2, and 3.

MTM-NP

- There are significantly more females and fewer males in Cohort 2 than in Cohort 1.

- There are significantly fewer females and more males in Cohort 3 than in Cohort 1 and 2.

Table 44. Frequency and proportion of patients categorized by language preference in NOMINAL Cohorts 1, 2, and 3 for the nominal MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 – May 31, 2014

MTM-P

- There does not appear to be a significant difference in proportion by preferred language between Cohorts 1, 2, and 3.

MTM-NP

- There does not appear to be a significant difference in proportion by preferred language between Cohorts 1 and 2.

- The proportion of people with English as the preferred language is significantly lower in Cohorts 1 and 2 than in Cohort 3.

- The proportion of people with "Other" as the preferred language is significantly lower in Cohort 3 than in Cohorts 1 and 2.

Summary of Demographic Categories for the LENIENT Population Definition for MTM-P and MTM-NP: Tables not shown.

- Females outnumber males in all study groups, roughly 55% to 45%.

- White or European American race group is the largest group at 46%, followed by Black or African American group at 22%, then Hispanic at 18%.

- The age groups 41-50, 51-55, 56-60, and 61-65 are roughly equally sized. The 21-40 age groups are significantly lower. There was a negligible amount of persons under 21 and over 65.

- Over 85% of people have English as their preferred language and 13% prefer Spanish. Just over 1% has another language preference.

Summary of Demographic Categories for the STRICT Population Definition for MTM-P and MTM-NP Tables not shown.

- Females outnumber males, 61% to 39%.

- White or European American race group is the largest group at 48%, followed by Black or African American group at 20%, then Hispanic at 18%.

- The age groups 41-50 and 61-65 are the same exact size and the two largest groups at 24%. The age groups 51-55 and 56-60 are roughly equally sized around 20%. The 21-40 age groups are significantly lower at 11%.

- Over 83% of people have English as their preferred language and 15% prefer Spanish. Just over 1% has another language preference.

- Nobody died in this criteria group.

EQ 5: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG1 (MTM-NP), and CG2 for mortality and morbidity measures?

Interpretation of Descriptive Tables EQ 5

Table 45. Summary statistics for number of deaths and annualized mortality rate applying LENIENT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- Mortality was somewhat higher in the MTM-NP study group than in the MTM-P study group.
Note: Deaths were excluded by definition from the STRICT population definition.

Table 46. Summary statistics for number of persons with two or more chronic conditions (MCC) as tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- Binomial test concludes there is no significant difference in the proportion of people with MCC between MTM-P and MTM-NP.

Table 47. Summary statistics for number of persons with two or more MCCs as tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- There is no significant difference in the proportion of people with MCC between MTM-P and MTM-NP.

Table 48. Summary statistics for the mean number of chronic conditions tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- There is no significant difference in the proportion of people with MCC between MTM-P and MTM-NP.

Table 49. Summary statistics for the mean number of chronic conditions per recipient tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM-P and MTM-NP (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

- There is no significant difference in the proportion of people with MCC between MTM-P and MTM-NP.

Interpretation of Regression Tables EQ 5 Mortality and Morbidity

Table 50. Robust logistic regression base and DiD model estimates and p-values for a model of mortality for LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- Age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level.
- In the DiD model, the parameter estimates did not converge.

Table 51. Robust logistic regression base and DiD model estimates and p-values for a model of two or more MCCs as tracked by the John's Hopkins ACG System applying LENIENT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.
- All race groups are significant in both base and interaction models at a 0.05 significance level. The positive coefficient for all groups suggests that there are higher odds of having two or more MCCs in reference to White and European Americans.
- The coefficients for age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating that both are positively associated with a recipient having multiple chronic conditions.

Table 52. Robust logistic regression base and DiD model estimates and p-values for a model of two or more MCCs as tracked by the John's Hopkins ACG System applying STRICT MTM-P and MTM-NP population groups, Florida MTM program June 1, 2010 - May 31, 2014

- The base model and the DiD model found no difference between study groups.
- The coefficients for age and ACG risk weight variables are significant in both base and interaction models at a 0.05 significance level indicating that both are positively associated with a recipient having multiple chronic conditions.

EQ 6: What are the differences in the pre-intervention and intervention periods within the intervention group for MTM process measures?

Interpretation of UF COP MTM-P Process Measure Descriptive Tables EQ 6

Table 53. Comparison of total interventions recorded by the UF COP pharmacy staff for all Cohorts 1, 2, and 3 participants, Florida MTM program evaluation June 1, 2011 to May 31, 2014

- There is substantial overlap in the naming conventions for the three Cohorts although some changes are evident due to changes in recording procedures by the UF COP staff.
- Cohort 3 introduced the use of an MTM case management system provided by an external vendor to UF COP. This contrasts with the customized Excel spreadsheets used for Cohorts 1 and 2. UF COP did not continue to use the vendor's software after Cohort 3 was completed.

Table 54. Comparison of identified and resolved medication therapy problems for 20 selected MTM interventions in the MTM evaluation study group for Cohort 1, 2, and 3 participants, Florida MTM program evaluation June 1, 2011 to May 31, 2014

- The Table lists all the problems identified and resolved by UF COP staff for all three cohorts.
- Differences in the manner of data collection placed some limitations on the ability of the evaluation team to verify UF COP quarterly reports for Cohort 3 in the same manner as was done for Cohort 1 and 2.
- However, Cohort 3 data are consistent with Cohort 1 and 2 data both in terms of the type of problems.
- Previous evaluation reports indicated a high concordance between the evaluation team's validation of findings for Cohort 1 and 2 with the UF COP quarterly reports.
- Across all 3 cohorts, 54 clinically significant Level 1 or 2 drug interaction problems were identified.
- Across all 3 cohorts, 43 instances where pill burden could be decreased, opportunities for combination therapy or removal of duplicate therapies were identified.
- Across all 3 cohorts, 235 instances of gaps in therapy, insufficient dosage and insufficient duration of therapy or a lack of therapy were identified.
- The mean number of problems identified per MTM-P group member was 0.7, 1.3, and 0.4 for Cohorts 1, 2, and 3, respectively.

- The mean percentage of identified problems resolved was 28.6%, 40.9%, and 10.2% for Cohorts 1, 2, and 3, respectively.
  - The mean percentage of problems resolved in Cohort 1 and 2 are similar to the level reported in other MTM literature.
- It is not known why the number of problems identified per recipient and the percent that were resolved declined in Cohort 3 relative to Cohorts 1 and 2. Potential explanations might include differences in the MTM population or the UF-COP personnel during the Cohort 3 intervention as compared with Cohorts 1 and 2 or perhaps the use of the new MTM management software employed for Cohort 3 had the unintended consequence of reducing the number of documented problems and resolutions.

Qualitative Findings

An Overview of the Qualitative Evaluation Team Effort

The qualitative component of this mixed methods project lends a much deeper understanding of the underlying processes, providing a more nuanced evaluation of the MEDs-AD Waiver project based on MTM principles. The data for this evaluation emanates from a series of personal interviews conducted by our evaluation team with Medicaid Administrative Personnel (MCAP), UF COP, PCPs, and randomly selected MTM recipients.

The Evaluation Team (ET) associated with the qualitative evaluation effort consists of multidiscipline members representing three academic institutions. The lead analyst, an Associate Professor at the FSU College of Social Work and a Co-PI of the project, is an expert in qualitative methodology and oversaw all interviews conducted by the ET Research Assistants (RAs). In addition, she, along with Florida A&M University (FAMU) pharmacists with an expertise in MTM and geriatrics, constructed the original interview guides, which were used for interviewing participants from the MTM (intervention) years (June 1, 2011 through May 31, 2014).

The pharmacists provided extensive knowledge of patient interactions gained from hands-on clinical experience. The original ET included the Associate Chair of Research in the Department of Medical Humanities and Social Science at the FSU College of Medicine, a clinical psychologist and expert in health behavior, the Associate Dean of Research at the FSU College of Social Work, and an interdisciplinary scholar who brought extensive research experience in health care. Their insights into health behavior were utilized in formulating the evaluation design and measures. Furthermore, key informant interviews (a series of interviews with MTM staff at the UF COP Call Center and MCAP) completed in the first year of the project were instrumental in developing appropriate recruitment materials (e.g., letters, scripts) as well as interview guides and closed-ended questions.

During the past three MTM program (intervention) years, the ET has completed interviews with two MCAP staff and three UF COP Call Center personnel (key informants), 62 MTM program participants, 20 persons who were eligible for but refused to participate in the MTM program, and four primary care physicians (PCPs). With the exception of the MCAP interviews, these interviews were conducted by a staff of graduate RAs at the College of Social Work trained by the lead analyst in all aspects of qualitative research methodology. These RAs conducted, transcribed, and coded interviews with MTM program

participants, those who refused to enroll in the MTM program, and PCPs under the supervision of the lead analyst. Their commitment to the evaluation of the MEDs-AD Waiver MTM program was exemplary.

Data Collection. Interviews were digitally recorded with permission of the participants and transcribed word for word. All tapes and transcriptions were kept on password-protected computers with access limited to the ET.

Data Management. Data were entered into Atlas/ti software for analysis, an established software package that allows for the storage of qualitative codes and serves as an organization tool for studies using multiple interviews. Two members of the ET coded one transcript, with consensus being reached on codes, themes, and domains. A coding scheme was established and used when coding subsequent transcripts.

Analytic Method. Initially, the ET examined each interview for emerging themes and relevant codes were developed utilizing the constant comparative method; however, they were not confined to these codes. This method allowed coders to compare new information to codes identified earlier and develop new codes if none existed for the current data. This process allowed for a structured and systematic data analysis method while optimizing the emergence of new codes to capture new ideas as they developed.

Qualitative Evaluation: MTM Participant Interviews

It is the very essence of this evaluation to hear the opinions of MTM program participants, often in their own words, that provide information not available from any other source. Indeed, the participants are the true experts on the effectiveness and meaning of the MTM program. It was the decision of the ET, in consultation with AHCA, to include the voices of the MTM program participants in this segment of the evaluation.

Evaluation Questions
Interviews with MTM program participants are closely aligned with the following research questions:

EQ 7- What are the most successful aspects of the MTM program based on participant perspectives?

EQ 8 - What are the lessons learned from this program from the perspectives of Florida MCAP, MTM staff, recipients (i.e., participants), and PCPs?

EQ 9 - How does this program impact recipients' (i.e., participants') ability to understand medications, take a more active part in their care, and understand the questions to ask their doctor or when to contact their doctor?

EQ 10 - How do recipients view this program from individual perspectives?

This project used established methods of qualitative research to provide information helpful in understanding the underlying processes while evaluating the MTM program as it is implemented by the call center at the UF COP.

Methods and Processes

Data Sources

Primary data sources for the qualitative evaluation consisted of a series of interviews with MTM program participants and primary care providers of participants.

Study Population (MTM program participants). The RAs conducted interviews with a random sample from the universe of MTM program participants (n = 455) who had completed the program (i.e., had a completed CMR). Throughout the course of the study, 283 potential participants were randomly selected.

Recruitment. The ET mailed a letter explaining the study and invited participation to each potential participant. The letters were written in easily understandable language and, whenever possible, included the name of the UF COP staff member who had conducted the CMR. This method was designed to aid participants in understanding the specific program referenced in the letter and the consequent interview. Furthermore, the letter stated that findings would be kept confidential and that neither participation nor refusal would have any effect on their Medicaid benefits. The letter was followed by a phone call that included additional information, an opportunity for potential participants to ask questions, and informed consent for those participants who wished to participate. A copy of the informed consent was mailed to each interview participant.

Interview Protocol. The ET used a semi-structured interview guide that had been established at the inception of the evaluation with questions and prompts based on a literature review, input from MCAP

and the UF COP Call Center staff, and approved by AHCA personnel. Interviewers used screening questions to determine that the participant was the person identified and an additional question to determine if they remembered the MTM program. There were four overarching, open-ended questions.

1. How would you describe the medication management program in which (CONTACT NAME) asked you about your medicines?

2. What do you see as the best part of the program?

3. If you could change one thing about the program, what would it be?

4. How do recipients view this program from individual perspectives?

In addition, the interviewers followed up on new areas and topics mentioned by the MTM program participants, in accordance with standard interview conduct. Finally, there were five closed-ended (yes/no) questions and one global rating item. The RAs audiotaped each interview with permission of the participants. AHCA and Institutional Review Boards (IRBs) approved all interview protocols, surveys, and scripts prior to implementation. All interviews were conducted by telephone and scheduled for the convenience of the MTM program participants.

Data Management. A tracking database in Microsoft Access was maintained throughout the project to record pertinent information regarding contacts made with participants and enrollment status. Interviews were digitally recorded with permission of the participants and transcribed word for word using Dragon Naturally Speaking software. All tapes and transcriptions were stored on password-protected computers with access limited to the ET.

Data Analysis. The analytic process began with immersion in the data; that is, the ET read the transcripts multiple times to become familiar with the content and flow. Data were entered into Atlas/ti software for analysis, an established software package that allowed for the storage of codes and served as an organizational tool for studies using multiple interviews. Atlas/ti also allowed for "memoing;" that is, the ET was able to record and retain notations related to underlying themes during the coding process. The ET then made notations (codes) for each small bit of data, a process called "open coding." Originally, four RAs coded one transcript, with consensus being reached on codes, themes, and domains under the supervision of the lead analyst. A coding scheme was established and used while coding subsequent transcripts. However, additional codes were allowed to emerge during the coding process.

At the end of the coding process, there were 31 codes identified. These 31 codes were used as the starting point for the analyses; however, new codes were allowed to emerge. These codes were organized into code families (i.e., codes with associated meanings or references) and themes were allowed to emerge.

The data were analyzed for both manifest and latent codes and themes. For example, a manifest code might include what the participant found most helpful (e.g., explaining the use of the medications). However, in addition to the manifest codes that are concrete, there were underlying concepts (latent codes) such as empathy and respect that were also evident to many of the participants. Indeed, pharmacists' empathy, respect, and concern became a theme.

When the overall coding process was completed, the codes became part of a larger code family. For example, one code family was "pharmacist," which comprised those responses that referred to the pharmacist, independent of the program. Because this code family was present in nearly all of the interviews and because it contained information that was not simply concrete, it was identified as a theme. Themes generally represent underlying concepts that are more complex than simple codes.

However, qualitative coding is an iterative process and continued throughout the project. In addition, the responses to the closed-ended questions included in the interview guide were also analyzed and coded.

Strategies for Rigor. A key element in establishing validity in qualitative research is triangulation (i.e., the use of more than one data source or method of data collection). This portion of the study incorporated two methods of triangulation: analytic triangulation and interdisciplinary triangulation. First, during data analysis, coding involved two independent coders. The interdisciplinary nature of the ET supported interdisciplinary triangulation as both a pharmacist and a methodological expert were involved in the initial formulation of the interview guides.

MTM Participant Interviews -- Findings

There were 283 cases randomly selected for recruitment. After removal of ineligible participants (deceased [n = 16]; primary language not English [n = 10]; unable to reach during time frame [n = 10]), letters were sent to 247 potential participants with phone follow-up. Of those, 59 had a telephone no longer connected, 39 refused, 63 were passive refusals (i.e., did not respond to 5 phone calls), 16 did not recall the MTM program, and 8 were pending when the study was completed resulting in 185 potential

participants who were called, but did not participate in the study. Of the 62 completed interviews, 2 were discarded for technical difficulties (i.e., sound quality too poor to understand) and 2 were considered unreliable respondents after completing the interview. Therefore, these qualitative findings are drawn from 58 interviews with MTM participants who indicated they remembered the project and provided information that would substantiate their understanding. The closed-ended responses are also reported (see Tables 55 and 56).

Open-Ended Questions

The overall responses to questions in this category were positive and enthusiastic. When asked about the experience of participating in the MTM program, the participants were overwhelmingly positive in their responses. One earlier participant's response was: "It [MTM program] was great. It was really, really great" and that theme has continued throughout the interviews completed throughout the evaluation. The responses were grouped into four categories, or code families: 1) Evaluation of the pharmacist(s); 2) Evaluation of the MTM program; 3) Best practices; and 4) Recommendations.

Evaluation of the Pharmacist(s)*.* Overall, the participants were very positive in their evaluations of the pharmacists. They were especially appreciative of the concern they felt that the pharmacists demonstrated for them. As one participant stated, "She was very respectful, yes." Another said, "They treated me with respect. I really appreciated how they did the program." Another participant stated, "She always talked with me, and that felt good talking with her." Participants often described the manner of the pharmacist as respectful, helpful, and polite. Perhaps this was best summed up by one participant's statement, "Well, she was nice."

In most cases, the participants described the pharmacists as knowledgeable. One participant stated, "Yes, she answered my questions." Some participants also noted that the pharmacist was a resource such as, "Like I told you, she was very nice and helpful and she also helped me find a psychiatrist."

Evaluation of the MTM program. Overall, participants were favorable in their evaluation of the program. There were three conceptual categories within this code family: 1) problem identification; 2) understanding; and 3) adherence.

Problem Identification

Participants acknowledged that there were medication issues that emerged solely as a result of the MEDs-AD MTM program. The interactive nature of the call was depicted in this quotation "She asked

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me some questions and I said well yeah and she said you might want to mention that to your doctor." Another said "And I did follow-up on one of the things (DISCUSSED WITH PHARMACIST) with my doctor." Another participant stated "…she did let me know about some of the medications that were being taken in double fashion, so it was very helpful. There was three medicines that I was taking that were double…my cardiologist and my doctor don't talk to each other, so that's why there were double."

<u>Understanding</u>

Participants found the process especially helpful in understanding their medications and providing information not readily available from other sources. One participant indicated, "…the ones I wasn't taking any more, she took them off the list." Another notable comment was, "Well, I had to ask about a medication substitution they were going to make and she explained what it was." Also, one participant stated, "Well, the medication is alright and the pharmacist that she was very helpful and helped me understand multiple medications."

<u>Adherence</u>

Some participants indicated increased medication adherence following the CMR. For example, one participant indicated, "Yeah, I did care more about it. It helped me a lot." Notably, one participant indicated that increased medication adherence was directly related to having received the phone call "Yeah, keep enforcing, keeping pushing you know, 'cause a lot of the medications I wasn't really taking." Another said "she got me going on them [MEDICATIONS]" and "I used to be real bad with medications, right? Yeah, she did help me with that."

Best practices. When asked about the best part of the program, most participants focused on the increased understanding of their medications. One participant stated, "Pretty good, pretty well. They explained everything."

Recommendations. When asked for recommendations, these participants echoed earlier ones stating that, "I wouldn't change anything. Oh, I wouldn't, it was fine." However, as earlier participants requested longer involvement, these participants wanted extended contact and continuity with the pharmacists saying, "Just the frequency that you would contact me to let me know about my medicines." A small number of participants had more than one year in the MTM program. One stated "It was very good. I did it last year too, about the same time. Both times the same thing happened that made me aware of the medications I was taking. I talked here with my doctor…It's a good system."

However, the most common response to what could be improved about the program was a variation on "Very Good!"

Closed-Ended Questions

Positive experiences of participants were also reflected in their answers to questions under this category. These findings align with those found in the open-ended questions in that participants were satisfied with the program overall, received helpful information, and were positive in describing the treatment they received from the UF COP staff who conducted the CMRs.

Interview Responses

Responses to the five closed-ended (yes/no) questions are summarized in Table 55. These questions were derived from existing measures of quality related to the MTM program.

Participants were also asked to make one global evaluation of the program. These results are indicated in Table 56.

It is clear that MTM-P who participated in qualitative interviews were pleased with the program as administered and found the information about the MTM program provided during the CMR helpful. They provided nuanced (i.e., appreciation for the concern of the UF COP staff; the mailed information was the least helpful) and global support for the MTM program. All participants rated the program good or very good overall. Their recommendation that the program continue provides insight into the needs of participants for support in addressing their complex medical issues and echoes the statements of UF COP staff who wished to keep in touch beyond the CMR. These findings are particularly robust in that they are consistent across multiple cohorts of participants and regardless of whether the full three claims reviews were completed. Those who declined to participate were varied in their reasons for refusal; however, the largest segment suggested that information regarding the program prior to the recruitment call would have been helpful.

Participant Interviews: Refusals

In addition to interviewing participants in the MTM program, the ET contacted potential participants (n=47) who had been contacted by UF COF personnel, but had refused to participate in the program. Of those contacted, twenty (20) provided information regarding their reasons for refusing MTM. Using content analysis, these data were categorized into 9 conceptual areas: 1) never received information; 2) knew enough about medications; 3) was feeling better and did not require more medical advice; 4) was

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frustrated with Medicaid in general; 5) received enough information from doctor; 6) was already enrolled in a similar program; 7) did not have enough time to participate; 8) relied only on the doctor for medical advice; and 9) did not remember the phone call. Once again, lack of communication appears to be key, as almost a third (29.6 %) indicated a lack of information prior to the initial call was the primary reason for refusal.

Qualitative Evaluation: Primary Care Physician Interviews

In addition to interviews with participants, the ET conducted interviews with primary care physicians (PCPs). These interviews were conducted by a staff of graduate student RAs at the College of Social Work and College of Medicine who have been trained by the Lead Analyst in all aspects of qualitative research methodology. These RAs conducted, transcribed, and coded interviews under the supervision of the Lead Analyst.

These specific findings are based on interviews with four PCPs who have patients from the MTM-P or MTM-NP groups. These interviews took place after similar, though not equivalent, interviews with four key informants at the UF COP chosen by AHCA as being most knowledgeable about the MTM program and 39 MTM-P interviews. The preliminary findings of key informants and participants were previously reported and were helpful in developing the ET PCP interview process.

Importance of MTM Primary Care Provider (PCP) Perspective
It is difficult to overestimate the importance of the PCP in implementing the MTM process. As the medication prescribers, PCPs are an essential part of effectively implementing any MTM program. Within the MTM program, PCP involvement has been less than optimal. For example, in cases in which medication modifications have been recommended and faxed to the PCP of record, resolution rates ranged from 33-40% in the Cohorts 1 and 2 and declined to 26% in Cohort 3. That is, in less than half the cases have physicians made the recommended adjustments as indicated by subsequent claims reviews, or contacted the UF COP personnel to discuss their recommendations. Furthermore, UF COP personnel indicated they became excited even when the PCP refused to make the adjustment, because they knew that "at least they (the PCP) had read the fax." Given the integral role of the PCP as prescriber and the less than optimal involvement recorded, it is essential to speak to PCPs to determine their views of the MTM program.

Qualitative Evaluation Methods and Processes

This evaluation used established methods of qualitative research to provide information helpful in understanding the underlying processes while evaluating the MTM program as it is implemented by the call center at the UF COP. The Evaluation Team (ET) from the FSU College of Social Work and College of Medicine conducted these interviews with PCPs.

Primary Care Provider (PCP) Recruitment

In view of the limited involvement noted above, PCP recruitment became a critical issue. Indeed, in the original work plan submitted to AHCA in October 2012, the ET noted that access to PCPs was potentially problematic.

Therefore, the ET used multiple recruitment strategies including: 1) contacting a large initial pool of PCPs; 2) obtaining resources and permission (from AHCA and the FSU Institutional Review Board) to provide participation incentives ($100 gift cards); 3) purchasing recorders for use with cell phones to enhance flexibility and access; and 4) utilizing all the current RAs for PCP recruitment. The ET sent a letter or fax to the PCP and followed with a phone call. The ET conducted interviews with a purposive sample drawn from PCPs who had attended MTM program participants identified by AHCA and UF COP staff. Four interviews were conducted.

Interview Protocol

The ET used a semi-structured interview guide with questions and prompts based on an initial literature review and approved by AHCA personnel. PCPs were asked about what they know about the program, what might be different for patients who participate versus those who do not participate, any positive or negative effects that the program might have on the patient, and how does the patient's participation affect the PCP. In addition, the ET interviewers followed up on new areas and topics mentioned by the PCPs, in accordance with standard interview conduct.

Data Collection

Interviews were digitally recorded with permission of the participants and transcribed word for word. All tapes and transcriptions were kept on password-protected computers with access limited to the ET. AHCA and Institutional Review Boards approved all interview protocols, surveys, and scripts prior to implementation. Recruitment began in early October, 2013. The ET interviewers conducted the interviews via telephone. Due to low response rates, PCP interviews were not sought nor conducted in the third year of the evaluation.

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Data Management

A tracking database in Microsoft ACCESS was maintained throughout the project to record pertinent information regarding contacts made with PCPs and enrollment status. Interview transcriptions were entered into Atlas/ti software for analysis, an established software package that allows for the storage of codes and serves as an organization tool for studies using multiple interviews. All tapes and transcriptions were kept on password-protected computers with access limited to the ET.

Analytic Method

Upon completion of the initial three interviews, the ET examined each interview for emerging themes, and relevant codes were developed utilizing the constant comparative method. This method allowed coders to compare new information to codes identified earlier and develop new codes if none existed for the current data. This process allowed for a structured and systematic data analysis method, while optimizing the emergence of new codes to capture new ideas as they developed. Before completing additional interviews, members of the ET met to discuss codes, themes and domains as well recruitment and interview techniques. A code list was established and used in coding subsequent transcripts.

Data Analysis Process

Interviews were digitally recorded with permission of the participants and transcribed word for word using Dragon Naturally Speaking software. The analytic process began with immersion in the data; that is, the ET read the transcripts multiple times to become familiar with the content and flow. The ET then made notations (codes) for each small bit of data, a process called "open coding." These codes were recorded in Atlas/ti as the initial code list. Atlas/ti also allowed for "memoing"; that is, the ET was able to make and retain notations related to underlying themes during the coding process. There were allowances for word-for-word (in vivo) coding during the coding process.

As the coding process is iterative, there is the expectation that the code list will be expanded and amended as the interview process continues. While there were no codes established prior to beginning this process, in the final report findings from these interviews have been triangulated with those from key informant and participant interviews as well as quantitative findings in the integrated findings below to provide a more comprehensive qualitative evaluation of the MTM program.

PCP Interviews—Findings

Despite the small sample size, our initial findings among the completed interviews are consistent in some areas: 1) PCPs are aware of the MTM process overall, usually from experience with other insurance or

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funding sources; however, PCPs do not remember individual patients; 2) PCPs give general support, with some reservations, to the idea of MTM for Medicaid patients; and 3) PCPs would welcome an initial contact regarding individual participants of MTM through the MTM program.

MTM as a Process

All the PCPs interviewed had some familiarity with the MTM process; however, they could not remember the individual person nor did they realize that MTM was available to Medicaid patients. That is, they did not know that there was an MTM program being conducted under the auspices of Medicaid. For example, one PCP stated "I mean, I didn't realize they were doing this…I see it with other commercial insurance, but not Medicaid." Or another stated, "(…the MTM program) is something new to me."

Support

PCPs, who were interviewed, provided general support of MTM for Medicaid patients. Their thoughts were that MTM could lead to greater adherence on the part of the patient. When asked about how persons enrolled in the program might differ from those not enrolled, one PCP responded, "What might be different is increased compliance with their medicine. They would understand what it's for and why they take it, and increased refill compliance." Another stated, "I think that the general idea of your program makes sense" and, "Oh, it will definitely increase the patient's medication compliance."

Yet, PCPs also had reservations about the program. One asked about the funding for the program. One PCP stated "some of these patients are non-compliant anyway." Furthermore, they question the cost/benefit of a state-funded program asking "Where's the money going to come from?" Also, "Many physicians stay away from Medicaid because of their reimbursement." Another stated, "I guess it could probably help the cost of healthcare…to prevent hospitalization, to prevent long-term problems from not taking the medicine." But one PCP plainly stated, "It would be a waste of tax payer money." Conversely, another PCP stated, "It's high time some source of organization is actually on the side of the patients; especially Medicaid."

Initial Contact

PCPs stated that "it would have been nice" when probed about notification that patients or a specific patient was enrolled in the MTM program. However, another stated, "I always disregarded the documents because I did not want the insurance company or anyone telling me what to do."

Qualitative Conclusions

The findings from all cohorts of MTM participants indicate that the program is viewed positively by the participants, who value the respect and empathy demonstrated by the pharmacists. Most participants found the program helpful and wished for longer engagement. That was also a theme that emerged when participants were asked for recommendations; however, most indicated that they saw no need for changes to the MTM program. Overall, these findings are robust and consistent in support for the MTM program. PCPs indicated they supported the concept of MTM; however, they needed some initial orientation by fax or letter for a specific person.

Quantitative and Qualitative Evaluation Integrated Findings

In this report, it is important to integrate findings from both the Quantitative and Qualitative Components around common concepts that can lead to a more nuanced understanding of findings when considered separately. This section includes integrated findings related to medication adherence and PCP participation.

Medication Adherence

This section integrates our findings regarding medication adherence (i.e., taking the correct drugs, for the correct indications, at the correct times, at the correct dose, and under the proper conditions for safe and effective use) from the following sources: 1) literature review; 2) quantitative analyses used to answer EQ-3; 3) qualitative participant interviews; and 4) best practices. The theme of adherence is used as an organizing framework as medication adherence is an established predictor of both improved patient outcomes and cost benefits; therefore, an optimal outcome measure for the effectiveness of the MEDs-AD Waiver MTM program as administered by the UF COP.

Our review of the literature found that there were few MTM research studies that focused on clinical outcomes such as adherence. However, in cases in which adherence was measured, there was evidence of greater adherence associated with participation in MTM programs.

In lieu of direct evidence of adherence through patient observation, we used standardized measures, the Medication Possession Ratio (MPR) and the Continuous Single-Interval Measure of Medication Availability (CSA), as surrogates for adherence in the quantitative component of the study. Results from the pharmacy adherence analysis showed that while gaps in prescription coverage did exist in the MTM-P and MTM-NP cohorts, these gaps were not sufficient to create statistically significant difference in

mean MPRs in the pre-intervention and intervention periods and also did not produce a statistically significant difference in the mean CSAs for any study period. MPR and CSA values are similar in the MTM-P and MTM-NP groups in all study periods. Therefore, despite gaps in medication coverage, the MTM-P and MTM-NP populations exhibited good adherence to their medications in all three cohorts.

Despite the lack of statistically significant differences between MTM-P and MTM-NP participants, medication adherence was a reoccurring theme in the MTM program participant interviews. Notably, from the MTM program participants' perspectives, the MTM program clearly increased their adherence. Participants openly stated that they were not adherent prior to the CMR and that increased medication adherence was directly related to MTM participation. Specifically, they noted that pharmacists' encouragement led to their increased adherence. This finding occurred in the most recent interviews as well as those conducted earlier.

In addition, when evaluating best practices, one recommendation, obtaining laboratory results, presents another potential surrogate for adherence. Requesting the laboratory results from the prescriber prior to the CMR and, again, post-CMR has multiple uses. This request will alert the physician that the person is going to participate in the program and will provide the pharmacist with a more detailed report. It is unlikely that this information is available from all participants. However, obtaining laboratory values provides a basis for comparison that may be linked to adherence.

Data indicate that extant literature, although quite limited, supports a positive association of MTM programs with medication adherence. And although the adherence levels of both MTM-P and MTM-NP were good as measured by MPR and CSA, interviewed MTM program participants reported increased medication adherence attributable to MTM participation; specifically, encouragement by UF COP pharmacists. Furthermore, obtaining laboratory values prior to and following the CMR, presents another opportunity to evaluate adherence as well as providing the best practices gold standard for clinical effectiveness of the MTM program as administered by the UF COP.

PCP involvement in the MTM Program MEDs-AD Demonstration Project

This section presents integrated findings regarding primary care physician (PCP) involvement from the following sources: 1) quantitative analyses used to answer EQ-7; 2) qualitative interviews with UF COP, PCPs, and MCAP personnel; 3) interviews with participants; and 4) best practices. PCP involvement discussed here includes responding to faxed recommendations for changes based on the CMR (i.e., refusing to make a recommended change or making a recommended change as noted in claims data

following a faxed request). PCP involvement was used as an organizing concept as PCP involvement is essential in implementing clinical changes that translate MTM concepts from abstract to direct patient outcomes.

Data indicate that the resolution rate (i.e., the indication that recommendations based on the CMR and fax transmission to physicians were made based on subsequent claims data reviews) is low. Of the 104 cases flagged in Cohort 1 only 42 (40%) are noted as resolved. In Cohort 2, there were 214 flagged cases, only 70 (33%) of which are noted as resolved. And in Cohort 3, of the 54 cases flagged, only 14 (26%) are noted as resolved. While these data do not show a statistically significant difference, they do indicate that in the best case, almost two-thirds of cases go unresolved. On the other hand, the reasons for the lack of resolution are unknown. It is possible that the PCP does not agree with the recommendation, has not seen their faxed recommendations, or is resistant to outside intervention with the patient's medical care.

Qualitative interviews with UF COP indicate their excitement over any type of response from PCPs. They do indicate that even refusals are welcome as these refusals confirm that the PCP has at least read the fax. Data are not available to indicate how often they receive this type of information; however, it is notable that direct responses are so infrequent that they are noted as remarkable. Interviews with MTM program participants noted that, on some occasions, they discuss the recommendations provided during the CMR with their PCPs. Even without detailed information on the underlying causes of these low resolution rates, it is notable that best practices recommend assessing the patient on the basis of all relevant clinical information available to the pharmacist, the patients' physical and overall health status, including current and previous diseases or conditions. Based on our review of the UF COP MTM program written protocol, the pharmacists do not contact the PCP prior to faxing with a (potentially unwelcome) recommendation. An area for improvement would be for the UF COP to contact the prescriber prior to the patient phone call and alert the PCP that his patient will be participating in the MEDs-AD Waiver MTM program administered by the UF COP. Physicians who participated in the PCP interviews indicated that they would welcome this approach. Based on the best practices assessment and the limited PCP interviews, it is possible that this preliminary phone call would enhance collaboration between the UF COP pharmacists and the PCP, the prescriber.

Summary and Recommendations - Quantitative

The current literature on MTM suggests that many patients receiving MTM counseling see improved health outcomes that include: 1) better medication adherence, 2) reduced exposure to potential drug-drug or drug-disease interactions, 3) reduced instances of over or under medication, and 3) better control of their conditions as reflected by fewer inpatient hospitalizations and visits to the ED. Payers have reportedly observed lower medical and prescription drug reimbursements for populations that receive an MTM intervention. However, the majority of the published literature evaluating MTM programs was conducted on populations of working age adults covered by private insurance through their employer or within the covered population of private insurance companies providing Medicare Part D coverage to an elderly Medicare population. Typically, these published evaluations included a large number of patients who received MTM counseling and were followed for at least one year.

The object of this evaluation was to examine the effectiveness of an MTM program in the context of a publicly funded Medicaid population of mostly working age adults who are not working due to the impact their disease or condition has on their ability to function in the workplace. Social determinants of health are known to play a larger role in the observed health outcomes of persons covered by Medicaid as compared with private insurance.

A variety of utilization, financial, and clinical outcomes of interest were compared in the current evaluation that controlled for demographic factors, chronic disease burden, and length of enrollment. All utilization, financial, and clinical outcomes were tested with at least two DiD models using different comparison groups to control for baseline differences in the outcome between MTM-P and MTM-NP. Additionally, propensity score matching analysis was conducted for total expenditures, pharmacy expenditures, odds of one or more inpatient discharges, and odds of one or more emergency room visits. Both of these methods are widely used in the comparative effectiveness literature.

The results of our evaluation of the Florida Medicaid MTM program for all three cohorts of MTM-P recipients receiving the MTM intervention between 2011 and 2014 found no statistically significant differences between the intervention group and the various comparison groups constructed from Medicaid recipients from the same eligibility pool who did not receive the MTM intervention. This

contrasts with findings reported in our previous report[4] that found that the Cohort 2 MTM-P group had lower odds of an inpatient discharge and a lower incidence of inpatient discharges as compared with comparison group.

The DiD and propensity score matching approaches are rigorous and therefore it may be harder to achieve statistical significance. There were indications that the MTM-P had positive financial and clinical outcomes that were not large enough to reach statically significant differences as compared with the comparison groups. For example, there were some descriptive findings with statistically significant findings:

- The mean annualized amount reimbursed for inpatient care per recipient is higher for the MTM-NP in both the the pre-intervetion period ($209,842 vs. $122,319 , p<.05) and intervention period ($57,684 vs. $52,220) with respect to the MTM-P group (Table 12).
- Overall, the mean reimbursed amount for inpatient care is higher for the MTM-NP than the MTM-P ($139,188 vs. $92,742, p<.05). The decline in mean reimbursed amount from pre-intervention to intervention period was larger in MTM-NP than in MTM-P ($152,158 vs. $70,099, p<.05). All differences were statistically significant.

There were also some descriptive findings that approached statistical significance using the less rigorous critical value of p greater than .05 but less than 0.10.

- The adjusted odds of one or more inpatient discharges in the base model were lower in the MTM-P group (OR=0.78, p=.066). However, after controlling for different baseline odds in the interaction model the difference in differences interaction term was clearly not significant (p=0,85) (Table 33).

Finally, there were also several examples of non-significant differences between MTM-P and MTM-NP suggesting that the intervention group was "heading in the right direction" over time. For example:

- Mean annualized reimbursement amount for all outpatient facility BETOS procedures (Table 9) is lower for the intervention year ($1,961) than the pre-intervention year ($2,288) for both groups. The mean decline between periods was $255 for MTM-P and $271 for MTM-NP and

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[4] MEDs-AD Waiver (MTM) Program Evaluation—Final Report Prepared for Florida Medicaid by the Florida State University College of Medicine, April 18, 2014 (page 52).

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mean overall reimbursement is lower for the MTM-P ($1956) than the MTM-NP $2186). None of the differences are statistically significant.

- Mean annualized reimbursement amount for all professional services BETOS procedures (Table 10) is lower for the intervention year ($5,659) than for the pre-intervention year ($6,947) for both groups. The mean decline between periods was $2,234 for MTM-P and $1,004 for MTM-NP. The difference is not statistically significant. Overall, reimbursement is higher in MTM-NP ($6,650) than MTM-P ($5,946), but the difference is not statically significant.

- The mean annualized amount reimbursed for inpatient care per recipient is higher for the MTM-NP in both the the pre-intervetion period ($25,181 vs. $16,614) and intervention period ($14,205 vs. $13,093) with respect to the MTM-P group (Table 11). Overall, the mean reimbursed amount for inpatient care is higher for the MTM-NP ($22,997) than the MTM-P ($15,756). The decline in mean reimbursed amount from pre-intervention to intervention period was larger in MTM-NP ($10,975) than in MTM-P ($3,521). None of the differences were statistically signficant.

- Average treatment effect in the propensity score models for total reimbursements were generally lower in the MTM-P group, but those differences did not reach statistical significance (Table 28).

- The propensity score model for the odds of one or inpatient discharges also suggest lower odds in the MTM-P group but these findings had much higher p-values (Table 29). Using a less rigorous criteria for the critical value of the p-value (i.e., using $p<.10$ rather than $p<.05$ to determine a statistical difference) the adjusted odds of one or more AHRQ ACSC inpatient discharges were lower in the MTM-P group (OR=0.78, p=.066). After controlling for different base line odds the difference was not significant (Table 36).

Although no direct comparison group is available to gauge UF COP MTM services against, UF COP staff identified many problems among the three cohorts of MTM-P (nominal n=455)

- 54 clinically significant Level 1 or 2 drug interaction problems were identified.

- 43 instances where pill burden could be decreased, opportunities for combination therapy or removal of duplicate therapies were identified.

- 235 instances of a gap in therapy, insufficient dosage, insufficient duration of therapy, or a lack of therapy were identified.

- These services on the face of it are beneficial to the recipient and may contribute to financial, clinical, or humanistic outcomes that were too small to measure or in the case of humanistic outcomes like quality of life were not measured.
- The mean number of problems identified per MTM-P group member was 0.7, 1.3, and 0.4 for Cohorts 1, 2, and 3, respectively.
- The mean percentage of identified problems resolved was 28.6%, 40.9%, and 10.2% for Cohorts 1, 2, and 3, respectively.

Physician engagement with the Florida Medicaid MTM process continues to be a problem as has been reported in other MTM evaluations and likely contributes to sub-optimal rates of resolution of the problems identified by the UF COP staff.

Possible explanations for the divergent findings for the outcomes studied between the published findings on MTM programs and the results of this evaluation may be categorized as:

1. Characteristics of the MEG1 Florida Medicaid population that make measurement and evaluation difficult may mask a true benefit that could not be identified,
2. Characteristics of the design and implementation of previously published evaluation studies and their target populations that make them a poor comparison for this study population, and
3. The program simply has not produced any statistically significant results when applying rigorous methods for the metrics included for this evaluation.

Each of these possible explanations is below:

Characteristics of the Florida MEDs-AD MEG1 Population. The MEG1 population studied for this evaluation is dynamic with members exiting and occasionally reentering eligibility over the course of the pre-intervention and intervention year. Very few intervention or comparison group members were followed for two full years. Half or more were followed for 6 months or less during the two year study window for each cohort. Persons become ineligible when they become eligible for Medicare as a result of age or meeting the two-year waiting period for receiving Medicare benefits as a disabled individual younger than age 65. A smaller number become ineligible for the MTM program by entering into long-term care facilities, hospice or HCBS, and still others become covered under a MCO and are therefore ineligible. It was not unusual to see more than one exclusionary criteria met in the same program year for a given person.

There is some evidence to suggest that the recipients who self-selected into the MTM intervention group were somewhat different than the original query list developed by AHCA during Step 1 of recipient recruitment. Some statistically significant differences based on age, race, ethnicity, and AHCA administrative region of residence were observed between the original query list and the group that completed the CMR each year. Ideally, the intervention group should be representative of the larger pool of eligible MEG1 recipients. The differences that arose may have resulted from recipient preferences or recruitment processes. Although suboptimal, it is unclear what impact if any the observed differences between the MEG1 population pool and the final intervention groups had on evaluation findings.

A large body of evidence links what are loosely categorized under the term "social determinants"[5] to poor health outcomes and disparities in health and optimal use of health care services. Social determinants of health can be positive or negative but here we refer to determinants that have a negative impact on health. These social determinants are known to be highly prevalent in the Medicaid population. They appear as deficits in health literacy, problems navigating the health care system, lack of transportation, lack of support from family or friends, and sub-optimal like skills and problem solving ability. Recent changes in reimbursement policy have incentivized hospitals to consider mechanisms for reducing re-hospitalizations that are highly dependent on transition services that address social disparities and are delivered by social workers or other mid-level health professionals. There is some evidence that there is a business case, e.g., a positive return on investment, for offering these services because they reduce downstream costs[1,3,7-9,11,15].

Characteristics of other studies. The other published evaluations of MTM programs are not directly comparable because the privately insured populations in those studies are very different from the MEG1 Medicaid population in Florida. The research designs in many of the published studies are not very strong. They either study MTM program participants without any comparison group or the comparison group is not carefully chosen. Comparative effectiveness studies of this sort are very susceptible to misleading findings when a comparison group is not carefully chosen and differences between the intervention and comparison group are not carefully controlled statistically.

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[5] Social determinants can have either a positive or negative impact on health. This paragraph is limited to a discussion of the negative social determinants of health.

No statistically significant differences. No statistically significant differences were found because none existed in the context of this particular program for the outcome measures studied.

Recommendations:

1. Continue to evaluate the Florida MTM program over time to improve population size and choose alternate analytic designs and measures to address program effectiveness.

2. Mitigate the loss of sample size due to recipients aging into Medicare by only selecting persons for the original query list that are less than 63 years old. If the original query used by AHCA staff to obtain consent at the first stage only includes persons age 63 and below then recipients that provide consent and are sent to UF COP will not turn 65 until the post-intervention year.

3. If feasible, exclude recipients receiving Medicare or belonging to an MCO organization from the original query.

4. If a written, step by step protocol for creation of the original query by AHCA staff does not exist, then create one that addresses these issues:

    a. Documents the query terms used to create the original query call list.

    b. Explains how to identify recipients who are already ineligible for the MTM program at the time of original query creation due to Medicare, LTC, HCBS, MCO, or hospice utilization at the time before calls are attempted.

        i. This would be facilitated by creation of a detailed list of codes that indicate exclusion or inclusion as potential MTM program participants using the Aid Category, Benefit Category, and Assignment Plan data elements.

    c. Establishes a method for calling recipients on the original query list in random order to provide an equal probability of contacting recipients with the opportunity.

    d. Ensures Spanish speaking pharmacy staff is available to make calls for consent at stage one of consent to mitigate possible adverse selection probabilities of Spanish speakers.

    e. Use of a check list with recipients called during the first stage to confirm they are not currently receiving Medicare, LTC, HCBS, or hospice service and are not a member of an excluded MCO population.

    f. Develop a method to use existing information in AHCA files to identify persons who are likely to become eligible for Medicare before the intervention year is completed. The actual date of the first receipt of SSI may be useful in this regard.

5. Consider approaches to improving physician engagement with the MTM program to enhance the number of problems identified by UF COP that are resolved.

6. Consider approaches that use UF COP staff to address issues in the MTM-P population that are broadly categorized as social determinants of health and are highly prevalent in Medicaid populations.

    a. Anecdotal reports from UF COP staff and MTM participants suggest this already occurs informally

    b. Efforts at improving health literacy may enhance recipient understanding and self-efficacy at managing their conditions.

    c. Systematically referring recipients to appropriate agencies when problems amenable to social agency interventions are identified.

Other approaches might be developed based on the experience of UF COP pharmacists with MTM participants to date.

Summary and Recommendations - Qualitative

Despite the quantitative findings, the qualitative interviews with recipients indicate positive benefits from the perspectives of program participants. Participants report greater adherence, increased understanding of their medications, and generally positive responses to the pharmacists' interest in their well-being. While quality of life is not an intended or a measured outcome, it can be inferred from participant responses that they would like more direct contact from pharmacists. However, limited PCP engagement, as indicated by the key informant interviews, as well as the quantitative component, hampers the effectiveness of MTM intervention. Therefore, there are three recommendations:

1. Increase the amount of direct contact between the pharmacists and the participants by:

    a. Increasing the number of phone calls required per protocol; and/or

    b. Extending the program for more than the current one-year interval.

2. Increase PCP engagement by notifying physicians that individual patients are enrolled in the program prior to making recommendations.

3. Add medical social service agents (e.g., social workers or case managers) to the UF call center staff to meet the needs that extend beyond the mission of the MTM program.

Appendix Results Tables

Table 6. Summary statistics for length of enrollment for persons with observed enrollment in the entire MEDs-AD study population (MEG-1) before study group assignment or application of inclusion/exclusion criteria, Florida MTM program June 1, 2010 - May 31, 2014

Study Period	No. Recipients	Sum Enrolled Days	Mean Enrolled Days	Std. Dev.	Minimum	Maximum
Year 1 2010-2011	20,696	4,517,885	218	156	0	365
Year 2 2011-2012	20,696	5,623,378	271	135	0	365
Year 3 2012-2013	20,696	5,773,499	278	137	0	366
Year 4 2013-2014	20,696	5,300,302	256	156	0	365
Total	20,696	21,215,064	.	.	.	.

Note: The 20,696 unique persons represent all tracked recipients that formed the pool of perspective intervention and comparison group members identified on one or more study periods. Not all recipients are observed in each study period. However, they are nonetheless accounted for in each period with zero or more enrolled days.

Table 7. Summary statistics for length of enrollment for persons applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Sum Enrolled Days	Mean Enrolled Days	Std. Dev.	Minimum	Maximum	Median	Mean 95% LCL	Mean 95% UCL	Test P vs. NP
MTM-NP	SP-PRI	1,265	378,932	300	92	31	366	365	294	305	.
MTM-P	SP-PRI	363	114,883	316	79	61	366	365	308	325	.
Sub-Total	SP-PRI	1,628	493,815	303	90	31	366	365	299	308	.
MTM-NP	SP-INT	639	211,325	331	81	9	366	365	324	337	.
MTM-P	SP-INT	191	63,421	332	74	30	366	365	321	343	n.d.
Sub-Total	SP-INT	830	274,46	331	79	9	366	365	326	336	.
MTM-NP	All Periods	1,904	590,257	310	90	9	366	365	306	314	.
MTM-P	All Periods	554	178,304	322	78	30	366	365	315	328	.
Total	All Periods	2,458	768,561	313	87	9	366	365	309	316	.

Table 8. Summary statistics for length of enrollment for persons applying STRICT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Evaluation Group	Study Period	No. Recipients	Sum Enrolled Days	Mean Enrolled Days	Std. Dev.	Minimum	Maximum	Median	95% LCL	95% UCL	Test P vs. NP
MTM-NP	SP-PRI	413	138,946	336	66	30	365	365	330	343	.
MTM-P	SP-PRI	152	51,096	336	68	61	365	365	325	347	n.d.
Sub-Total	SP-PRI	565	190,042	336	67	30	365	365	331	342	.
MTM-NP	SP-INT	307	101,852	332	75	30	366	366	323	340	.
MTM-P	SP-INT	133	43,912	330	76	30	366	366	317	343	n.d.
Sub-Total	SP-INT	440	145,764	331	75	30	366	366	324	338	.
MTM-NP	All Periods	720	240,798	334	70	30	366	365	329	340	.
MTM-P	All Periods	285	95,008	333	72	30	366	365	325	342	n.d.
Total	All Periods	1005	335,806	334	71	30	366	365	330	339	.

Tables for Evaluation Question 1: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG 1 (MTM-NP), and CG 2 for utilization measures?

Descriptive Tables EQ 1 (procedure counts) and EQ 2 (reimbursement) are combined in Tables 9 and 10.

Table 9. Total and mean service counts and dollars for UB-04 outpatient facility claims by BETOS codes adjusted for enrolled days by claim type and by program period for MTM participant and MTM non-participant population groups using LENIENT inclusion/exclusion criteria, Florida MTM program June 1, 2010 - May 31, 2014

Outpatient Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count UB-4	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Evaluation and Management	MTM-P	SP-PRI	114,883	18	750	42	12	154	2	-55	60
Evaluation and Management	MTM-NP	SP-PRI	378,932	19	1,305	69	35	108	1	-41	43
Evaluation and Management	Sub-Total	SP-PRI	493,815	37	2,054	56	12	154	2	-45	48
Evaluation and Management	MTM-P	SP-INT	63,421	13	875	67	12	202	5	-79	89
Evaluation and Management	MTM-NP	SP-INT	211,325	66	8,643	131	0	4,663	15	-130	160
Evaluation and Management	Sub-Total	SP-INT	274,746	79	9,518	120	0	4,663	13	-121	146

Outpatient Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count UB-4	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Evaluation and Management	MTM-P	ALL	178,304	31	1,624	52	12	202	3	-65	72
Evaluation and Management	MTM-NP	ALL	590,257	85	9,947	117	0	4,663	6	-87	99
Evaluation and Management	Total	ALL	768,561	116	11,572	100	0	4,663	6	-82	93
Procedures	MTM-P	SP-PRI	114,883	50	4,955	99	95	100	16	-133	164
Procedures	MTM-NP	SP-PRI	378,932	261	69,353	266	54	1,661	67	-239	373
Procedures	Sub-Total	SP-PRI	493,815	311	74,308	239	54	1,661	55	-223	332
Procedures	MTM-NP	SP-INT	211,325	56	34,400	614	100	1,400	59	-229	348
Procedures	Sub-Total	SP-INT	274,746	56	34,400	614	100	1,400	46	-207	299
Procedures	MTM-P	ALL	178,304	50	4,955	99	95	100	10	-109	129
Procedures	MTM-NP	ALL	590,257	317	103,753	327	54	1,661	64	-236	364
Procedures	Total	ALL	768,561	367	108,708	296	54	1,661	52	-217	321
Other	MTM-P	SP-PRI	114,883	315	15,882	50	6	303	50	-216	316
Other	MTM-NP	SP-PRI	378,932	550	68,407	124	3	2,511	66	-238	370
Other	Sub-Total	SP-PRI	493,815	865	84,289	97	3	2,511	62	-233	358

Outpatient Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count UB-4	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Other	MTM-NP	SP-INT	211,325	61	32,005	525	4	2,171	55	-223	334
Other	Sub-Total	SP-INT	274,746	61	32,005	525	4	2,171	43	-202	287
Other	MTM-P	ALL	178,304	315	15,882	50	6	303	33	-181	246
Other	MTM-NP	ALL	590,257	611	100,413	164	3	2,511	62	-233	357
Other	Total	ALL	768,561	926	116,295	126	3	2,511	55	-223	334
Exceptions/ Unclassified	MTM-NP	SP-PRI	378,932	14	10,628	759	155	901	10	-110	130
Exceptions/ Unclassified	Sub-Total	SP-PRI	493,815	14	10,628	759	155	901	8	-97	113
Exceptions/ Unclassified	MTM-NP	SP-INT	211,325	19	25,327	1,333	380	5,611	44	-204	291
Exceptions/ Unclassified	Sub-Total	SP-INT	274,746	19	25,327	1,333	380	5,611	34	-184	251
Exceptions/ Unclassified	MTM-NP	ALL	590,257	33	35,955	1,090	155	5,611	22	-154	199
Exceptions/ Unclassified	Total	ALL	768,561	33	35,955	1,090	155	5,611	17	-138	172
MISSING	MTM-P	SP-PRI	114,883	7,043	622,624	88	0	4,780	1,978	313	3,644
MISSING	MTM-NP	SP-PRI	378,932	25,191	2,220,382	88	0	5,876	2,139	407	3,870
MISSING	Sub-Total	SP-PRI	493,815	32,234	2,843,006	88	0	5,876	2,101	385	3,818
MISSING	MTM-P	SP-INT	63,421	2,794	310,470	111	0	7,727	1,787	204	3,370

Outpatient Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count UB-4	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
MISSING	MTM-NP	SP-INT	211,325	10,880	1,064,549	98	0	12,780	1,839	233	3,444
MISSING	Sub-Total	SP-INT	274,746	13,674	1,375,019	101	0	12,780	1,827	226	3,427
MISSING	MTM-P	ALL	178,304	9,837	933,095	95	0	7,727	1,910	274	3,547
MISSING	MTM-NP	ALL	590,257	36,071	3,284,931	91	0	12,780	2,031	344	3,719
MISSING	Total	ALL	768,561	45,908	4,218,026	92	0	12,780	2,003	327	3,679
All BETOS Codes	MTM-P	SP-PRI	114,883	7,426	644,211	87	0	4,780	2,047	353	3,741
All BETOS Codes	MTM-NP	SP-PRI	378,932	26,035	2,370,074	91	0	5,876	2,283	494	4,072
All BETOS Codes	Sub-Total	SP-PRI	493,815	33,461	3,014,286	90	0	5,876	2,228	460	3,995
All BETOS Codes	MTM-P	SP-INT	63,421	2,807	311,345	111	0	7,727	1,792	207	3,377
All BETOS Codes	MTM-NP	SP-INT	211,325	11,082	1,164,924	105	0	12,780	2,012	332	3,692
All BETOS Codes	Sub-Total	SP-INT	274,746	13,889	1,476,270	106	0	12,780	1,961	303	3,620
All BETOS Codes	MTM-P	ALL	178,304	10,233	955,556	93	0	7,727	1,956	300	3,612
All BETOS Codes	MTM-NP	ALL	590,257	37,117	3,534,999	95	0	12,780	2,186	435	3,937
All BETOS Codes	Total	ALL	768,561	47,350	4,490,555	95	0	12,780	2,133	403	3,862

Table 10. Total and mean professional services counts and dollars for CMS-1500 professional service claims by BETOS codes adjusted for enrolled days by program period for MTM participant and MTM non-participant population groups using LENIENT inclusion/exclusion criteria, Florida MTM program June 1, 2010 - May 31, 2014

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Evaluation and Management	MTM-P	SP-PRI	114,883	7,424	470,301	63	0	545	1,494	47	2,942
Evaluation and Management	MTM-NP	SP-PRI	378,932	24,694	1,668,073	68	0	814	1,607	106	3,108
Evaluation and Management	Sub-Total	SP-PRI	493,815	32,118	2,138,374	67	0	814	1,581	92	3,069
Evaluation and Management	MTM-P	SP-INT	63,421	2,717	182,149	67	0	403	1,048	-164	2,261
Evaluation and Management	MTM-NP	SP-INT	211,325	10,337	726,450	70	0	4,663	1,255	-72	2,581
Evaluation and Management	Sub-Total	SP-INT	274,746	13,054	908,598	70	0	4,663	1,207	-94	2,508
Evaluation and Management	MTM-P	ALL	178,304	10,141	652,449	64	0	545	1,336	-33	2,704
Evaluation and Management	MTM-NP	ALL	590,257	35,031	2,394,523	68	0	4,663	1,481	40	2,922
Evaluation and Management	Total	ALL	768,561	45,172	3,046,972	67	0	4,663	1,447	23	2,871

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Procedures	MTM-P	SP-PRI	114,883	3,110	378,586	122	0	2,252	1,203	-96	2,502
Procedures	MTM-NP	SP-PRI	378,932	11,046	1,356,114	123	0	1,661	1,306	-47	2,660
Procedures	Sub-Total	SP-PRI	493,815	14,156	1,734,700	123	0	2,252	1,282	-59	2,623
Procedures	MTM-P	SP-INT	63,421	872	105,096	121	0	995	605	-316	1,526
Procedures	MTM-NP	SP-INT	211,325	4,538	534,483	118	0	1,400	923	-215	2,061
Procedures	Sub-Total	SP-INT	274,746	5,410	639,579	118	0	1,400	850	-242	1,941
Procedures	MTM-P	ALL	178,304	3,982	483,682	121	0	2,252	990	-188	2,168
Procedures	MTM-NP	ALL	590,257	15,584	1,890,597	121	0	1,661	1,169	-111	2,449
Procedures	Total	ALL	768,561	19,566	2,374,279	121	0	2,252	1,128	-130	2,385
Imaging	MTM-P	SP-PRI	114,883	3,324	201,300	61	0	1,152	640	-307	1,587
Imaging	MTM-NP	SP-PRI	378,932	11,059	681,997	62	0	1,152	657	-303	1,617
Imaging	Sub-Total	SP-PRI	493,815	14,383	883,296	61	0	1,152	653	-304	1,610
Imaging	MTM-P	SP-INT	63,421	1,033	60,810	59	0	1,150	350	-351	1,051

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Imaging	MTM-NP	SP-INT	211,325	4,351	285,771	66	0	1,152	494	-338	1,326
Imaging	Sub-Total	SP-INT	274,746	5,384	346,582	64	0	1,152	460	-343	1,264
Imaging	MTM-P	ALL	178,304	4,357	262,110	60	0	1,152	537	-331	1,404
Imaging	MTM-NP	ALL	590,257	15,410	967,768	63	0	1,152	598	-318	1,514
Imaging	Total	ALL	768,561	19,767	1,229,878	62	0	1,152	584	-321	1,489
Tests	MTM-P	SP-PRI	114,883	16,308	152,799	9	0	455	485	-340	1,311
Tests	MTM-NP	SP-PRI	378,932	57,720	524,821	9	0	1,694	506	-336	1,347
Tests	Sub-Total	SP-PRI	493,815	74,028	677,619	9	0	1,694	501	-337	1,339
Tests	MTM-P	SP-INT	63,421	5,485	51,871	9	0	463	299	-348	946
Tests	MTM-NP	SP-INT	211,325	23,195	239,850	10	0	1,694	414	-348	1,176
Tests	Sub-Total	SP-INT	274,746	28,680	291,721	10	0	1,694	388	-350	1,125
Tests	MTM-P	ALL	178,304	21,793	204,670	9	0	463	419	-348	1,185
Tests	MTM-NP	ALL	590,257	80,915	764,670	9	0	1,694	473	-341	1,287
Tests	Total	ALL	768,561	102,708	969,340	9	0	1,694	460	-343	1,264
Durable Medical Equipment	MTM-P	SP-PRI	114,883	1,356	88,560	65	0	16,081	281	-347	909

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Durable Medical Equipment	MTM-NP	SP-PRI	378,932	4,701	322,475	69	0	23,923	311	-349	971
Durable Medical Equipment	Sub-Total	SP-PRI	493,815	6,057	411,036	68	0	23,923	304	-349	957
Durable Medical Equipment	MTM-P	SP-INT	63,421	612	36,541	60	1	370	210	-333	753
Durable Medical Equipment	MTM-NP	SP-INT	211,325	2,857	204,476	72	0	13,933	353	-351	1,057
Durable Medical Equipment	Sub-Total	SP-INT	274,746	3,469	241,018	69	0	13,933	320	-350	990
Durable Medical Equipment	MTM-P	ALL	178,304	1,968	125,102	64	0	16,081	256	-343	855
Durable Medical Equipment	MTM-NP	ALL	590,257	7,558	526,952	70	0	23,923	326	-350	1,002
Durable Medical Equipment	Total	ALL	768,561	9,526	652,053	68	0	23,923	310	-349	969
Other	MTM-P	SP-PRI	114,883	1,266	463,169	366	0	7,613	1,472	35	2,908
Other	MTM-NP	SP-PRI	378,932	4,752	1,472,838	310	0	13,702	1,419	8	2,829
Other	Sub-Total	SP-PRI	493,815	6,018	1,936,007	322	0	13,702	1,431	14	2,848

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
Other	MTM-P	SP-INT	63,421	453	149,697	330	0	5,286	862	-238	1,961
Other	MTM-NP	SP-INT	211,325	2,167	771,439	356	0	13,702	1,332	-34	2,699
Other	Sub-Total	SP-INT	274,746	2,620	921,135	352	0	13,702	1,224	-86	2,534
Other	MTM-P	ALL	178,304	1,719	612,866	357	0	7,613	1,255	-72	2,581
Other	MTM-NP	ALL	590,257	6,919	2,244,276	324	0	13,702	1,388	-7	2,783
Other	Total	ALL	768,561	8,638	2,857,142	331	0	13,702	1,357	-22	2,736
Exceptions/ Unclassified	MTM-P	SP-PRI	114,883	1,342	56,323	42	7	350	179	-322	680
Exceptions/ Unclassified	MTM-NP	SP-PRI	378,932	2,931	264,385	90	0	3,294	255	-343	852
Exceptions/ Unclassified	Sub-Total	SP-PRI	493,815	4,273	320,708	75	0	3,294	237	-339	814
Exceptions/ Unclassified	MTM-P	SP-INT	63,421	230	14,436	63	8	262	83	-258	424
Exceptions/ Unclassified	MTM-NP	SP-INT	211,325	2,146	190,662	89	0	5,611	329	-350	1,009
Exceptions/ Unclassified	Sub-Total	SP-INT	274,746	2,376	205,098	86	0	5,611	272	-346	891
Exceptions/ Unclassified	MTM-P	ALL	178,304	1,572	70,759	45	7	350	145	-306	596
Exceptions/ Unclassified	MTM-NP	ALL	590,257	5,077	455,047	90	0	5,611	281	-347	910
Exceptions/ Unclassified	Total	ALL	768,561	6,649	525,806	79	0	5,611	250	-342	841

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
MISSING	MTM-P	SP-PRI	114,883	1,806	310,444	172	0	4,780	986	-190	2,162
MISSING	MTM-NP	SP-PRI	378,932	5,975	986,223	165	0	5,876	950	-204	2,104
MISSING	Sub-Total	SP-PRI	493,815	7,781	1,296,667	167	0	5,876	958	-201	2,118
MISSING	MTM-P	SP-INT	63,421	718	182,338	254	0	7,727	1,049	-164	2,262
MISSING	MTM-NP	SP-INT	211,325	2,566	523,837	204	0	12,780	905	-222	2,031
MISSING	Sub-Total	SP-INT	274,746	3,284	706,175	215	0	12,780	938	-209	2,085
MISSING	MTM-P	ALL	178,304	2,524	492,781	195	0	7,727	1,009	-181	2,198
MISSING	MTM-NP	ALL	590,257	8,541	1,510,060	177	0	12,780	934	-210	2,078
MISSING	Total	ALL	768,561	11,065	2,002,841	181	0	12,780	951	-204	2,106
All BETOS Codes	MTM-P	SP-PRI	114,883	35,936	2,121,482	59	0	16,081	6,740	3666	9,815
All BETOS Codes	MTM-NP	SP-PRI	378,932	122,878	7,276,926	59	0	23,923	7,009	3874	10,144
All BETOS Codes	Sub-Total	SP-PRI	493,815	158,814	9,398,407	59	0	23,923	6,947	3826	10,068
All BETOS Codes	MTM-P	SP-INT	63,421	12,120	782,938	65	0	7,727	4,506	1992	7,020
All BETOS Codes	MTM-NP	SP-INT	211,325	52,157	3,476,968	67	0	13,933	6,005	3104	8,907
All BETOS Codes	Sub-Total	SP-INT	274,746	64,277	4,259,905	66	0	13,933	5,659	2842	8,476

Professional Ambulatory BETOS Category Name	Study Group	Study Period	Enrolled Days	BETOS Code Count	Total Reimbursed Amount for BETOS Category ($)	Mean Reimbursed Amount for BETOS Category ($)	Min Reimbursed Amount ($)	Max Reimbursed Amount ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
All BETOS Codes	MTM-P	ALL	178,304	48,056	2,904,419	60	0	16,081	5,946	3058	8,833
All BETOS Codes	MTM-NP	ALL	590,257	175,035	10,753,893	61	0	23,923	6,650	3596	9,704
All BETOS Codes	Total	ALL	768,561	223,091	13,658,312	61	0	23,923	6,487	3471	9,502

Table 11. Total inpatient facility discharges and the mean amount reimbursed per discharge adjusted for enrolled days by program period for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. of Recipients with a Discharge	No. of Inpatient Discharges	Enrolled Days in the Inpatient Population	Total Reimbursed Amount for all Discharges ($)	Mean Reimbursed Amount per Discharge ($)	Min Amount per Discharge ($)	Max Amount per Discharge ($)	Mean Annualized Reimbursed Amount for Inpatient Discharges per Member-Year ($)	LCL 95% Annualized Rate ($)	Upper 95% Annualized Rate ($)
MTM-P	SP-PRI	109	111	33,989	1,547,146	13,938	691	116,481	16,614	16,362	16,867
MTM-NP	SP-PRI	434	436	119,393	8,339,041	19,126	0	238,234	25,494	25,181	25,806
Sub-Total	SP-PRI	543	547	153,382	9,886,187	18,073	0	238,234	23,526	23,225	23,827
MTM-P	SP-INT	32	32	10,958	393,076	12,284	1,514	43,521	13,093	12,869	13,317
MTM-NP	SP-INT	108	108	34,837	1,378,282	12,762	1,023	111,902	14,441	14,205	14,676
Sub-Total	SP-INT	140	140	45,795	1,771,358	12,653	1,023	111,902	14,118	13,885	14,351
MTM-P	All	123	143	44,947	1,940,222	13,568	691	116,481	15,756	15,510	16,002
MTM-NP	All	488	544	154,230	9,717,323	17,863	0	238,234	22,997	22,700	23,294
Total	All	611	687	199,177	11,657,546	16,969	0	238,234	21,363	21,076	21,649

Table 12. Total inpatient facility discharges and the mean amount reimbursed per discharge adjusted for enrolled days by program period for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. of Recip-ients with a Discharge	No. of Inpatient Discharges	Enrolled Days in the Inpatient Population	Total Reimbursed Amount for all Discharges	Mean Reimbursed Amount per Discharge	Min Amount per Discharge	Max Amount per Discharge	Mean Annualized Reimbursed Amount for Inpatient Discharges per Member-Year	LCL 95% Annualized Rate	Upper 95% Annualized Rate
MTM-P	SP-PRI	21	26	10,738	3,598,539	32,419	4,051	135,969	122,320	109,223	135,416
MTM-NP	SP-PRI	93	127	27,068	15,561,660	35,692	74	285,685	209,842	192,689	226,995
Sub-Total	SP-PRI	114	203	37,806	19,160,199	35,028	74	285,685	184,983	168,878	201,088
MTM-P	SP-INT	32	50	7,838	1,121,374	35,043	5,273	95,752	52,220	43,663	60,777
MTM-NP	SP-INT	56	76	23,465	3,708,376	34,337	3,875	144,243	57,684	48,691	66,678
Sub-Total	SP-INT	88	126	31,303	4,829,750	34,498	3,875	144,243	56,316	47,430	65,202
MTM-P	All	46	76	18,576	4,719,913	33,006	4,051	135,969	92,742	81,338	104,145
MTM-NP	All	137	253	50,533	19,270,036	35,423	74	285,685	139,188	125,217	153,158
Total	All	180	329	69,109	23,989,949	34,920	74	285,685	126,703	113,374	140,032

Table 13. Mean inpatient days among recipients with one or more inpatient stays by program period for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Intervention Year	Mean days in facility	Min. days in facility	Max. days in facility	95% LCL days in facility	95% UCL days in facility
MTM-P	SP-PRI	9.4	1	69	7.4	11.5
MTM-NP	SP-PRI	12.5	1	145	11.1	13.8
Sub-Total	SP-PRI	11.9	1	145	10.7	13.0
MTM-P	SP-INT	7.8	1	35	5.1	10.6
MTM-NP	SP-INT	9.4	1	71	7.4	11.5
Sub-Total	SP-INT	9.1	1	71	7.4	10.8
MTM-P	ALL	9.0	1	69	7.4	10.7
MTM-NP	ALL	11.9	1	145	10.7	13.0
Total	ALL	11.3	1	145	10.3	12.3

Table 14. Mean inpatient days among recipients with one or more inpatient stays by program period for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	Mean days in facility	Min. days in facility	Max. days in facility	95% LCL days in facility	95% UCL days in facility
MTM-P	SP-PRI	6.0	1	16	4.3	7.7
MTM-NP	SP-PRI	7.3	1	45	5.8	8.8
Sub-Total	SP-PRI	7.0	1	45	5.8	8.2
MTM-P	SP-INT	7.4	2	19	5.6	9.3
MTM-NP	SP-INT	7.1	1	29	5.3	8.9
Sub-Total	SP-INT	7.3	1	29	5.9	8.6
MTM-P	ALL	6.8	1	19	5.5	8.1
MTM-NP	ALL	7.2	1	45	6.1	8.4
Total	ALL	7.1	1	45	6.2	8.0

Table 15. Total and mean prescription counts and dollars adjusted for enrolled days by program period for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recip-ients	Enrolled Days	Total Prescrip-tion Count	Mean Prescrip-tion Count per Recipient	Min. Prescrip-tion Count	Max. Prescrip-tion Count	Total Amount Reimbursed ($)	Total Reimburse-ment Rate Per Day ($)	Mean Annualized Reimbursed Rate per Member-Year ($)	Lower Annual Reim-bursed Rate ($)	Upper Annual Reim-bursed Rate ($)
MTM-P	SP-PRI	363	114,883	17,680	48.7	1	270	1,638,409	14	5,205	2,504	7,907
MTM-NP	SP-PRI	1265	378,932	56,228	44.6	1	265	5,048,819	13	4,863	2,252	7,475
Sub-Total	SP-PRI	1628	493,815	73,908	45.5	1	270	6,687,228	14	4,943	2,310	7,575
MTM-P	SP-INT	191	63,421	10,874	57.8	2	196	1,266,822	20	7,291	4,093	10,488
MTM-NP	SP-INT	639	211,325	34,178	54.8	1	289	3,352,877	16	5,791	2,941	8,641
Sub-Total	SP-INT	830	274,746	45,052	55.5	1	289	4,619,700	17	6,137	3,204	9,071
MTM-P	ALL	554	178,304	28,554	51.8	1	270	2,905,231	16	5,947	3,059	8,835
MTM-NP	ALL	1904	590,257	90,406	48	1	289	8,401,696	14	5,195	2,496	7,894
Total	ALL	2458	768,561	118,960	48.8	1	289	11,306,927	15	5,370	2,626	8,114

Table 16. Total and mean prescription counts and dollars adjusted for enrolled days by program period for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recip-ients	Enrolled Days	Total Prescrip-tion Count	Mean Prescription Count per Recipient	Min. Prescrip-tion Count	Max. Prescrip-tion Count	Total Amount Reim-bursed ($)	Total Reimburse-ment Rate Per Day ($)	Mean Annualized Reim-bursed Rate per Member-Year ($)	Lower Annual Reim-bursed Rate ($)	Upper Annual Reim-bursed Rate ($)
MTM-P	SP-PRI	152	51,096	8,976	59.1	2	201	738,266	14	5,274	2,554	7,993
MTM-NP	SP-PRI	413	138,946	25,160	61.1	1	249	2,650,536	19	6,963	3,838	10,087
Sub-Total	SP-PRI	565	190,042	34,136	60.5	1	249	3,388,803	18	6,509	3,488	9,530
MTM-P	SP-INT	133	43,912	8,235	62.4	2	270	673,270	15	5,596	2,795	8,398
MTM-NP	SP-INT	307	101,852	19,325	62.9	1	265	1,370,973	13	4,913	2,288	7,538
Sub-Total	SP-INT	440	145,764	27,560	62.8	1	270	2,044,243	14	5,119	2,440	7,798
MTM-P	ALL	285	95,008	17,211	60.6	2	270	1,411,536	15	5,423	2,665	8,180
MTM-NP	ALL	720	240,798	44,485	61.9	1	265	4,021,509	17	6,096	3,172	9,019
Total	ALL	1005	335,806	61,696	61.5	1	270	5,433,045	16	5,905	3,028	8,783

Regression Models

Table 17. General Estimating Equation negative binomial model estimates and p-values for total CPT/HCPCS procedure codes in the CMS-1500 professional claims and the UB-04 outpatient claims files for the LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-1.420	0.150	-1.710	-1.130	-9.550	<.0001	-1.425	0.148	-1.715	-1.135	-9.620	<.0001
MTM-P	0.050	0.040	-0.020	0.120	1.440	0.149	0.056	0.042	-0.026	0.139	1.330	0.182
MTM-NP	.	.	.	.	.	.	.	.	.	.	.	.
Female	0.090	0.030	0.030	0.150	2.890	0.0039	0.091	0.032	0.030	0.153	2.900	0.0038
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.010	0.040	-0.100	0.080	-0.190	0.8517	-0.008	0.044	-0.095	0.079	-0.180	0.8539
Hispanic	0.030	0.040	-0.050	0.110	0.620	0.5326	0.026	0.041	-0.055	0.106	0.620	0.5337
Other	0.000	0.040	-0.080	0.090	0.090	0.9315	0.003	0.042	-0.078	0.085	0.080	0.936
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	0.000	0.000	0.000	0.010	2.930	0.0034	0.004	0.002	0.001	0.007	2.930	0.0034
Intervention	-0.060	0.020	-0.110	-0.010	-2.480	0.013	-0.055	0.025	-0.103	-0.007	-2.250	0.0243
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
Died	-0.510	0.120	-0.740	-0.270	-4.240	<.0001	-0.505	0.119	-0.739	-0.271	-4.230	<.0001
Alive	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.310	0.010	0.280	0.340	22.220	<.0001	0.310	0.014	0.283	0.337	22.350	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.015	0.066	-0.144	0.114	-0.230	0.8186
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 18. General Estimating Equation negative binomial model estimates and p-values for total CPT/HCPCS procedure codes in the CMS-1500 professional claims and the UB-04 outpatient claims files for the STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-1.879	0.131	-2.136	-1.621	-14.300	<.0001	-1.893	0.132	-2.152	-1.634	-14.310	<.0001
MTM-P	-0.041	0.042	-0.122	0.041	-0.980	0.3289	0.004	0.054	-0.102	0.109	0.070	0.9461
MTM-NP												
Female	0.103	0.043	0.018	0.187	2.380	0.0175	0.103	0.043	0.018	0.188	2.380	0.0172
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.008	0.060	-0.126	0.111	-0.120	0.9008	-0.006	0.060	-0.125	0.112	-0.100	0.9193
Hispanic	-0.024	0.059	-0.140	0.093	-0.400	0.6921	-0.026	0.060	-0.143	0.091	-0.430	0.6677
Other	-0.008	0.060	-0.125	0.108	-0.140	0.8884	-0.009	0.060	-0.126	0.108	-0.150	0.884
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	0.006	0.002	0.002	0.011	2.710	0.0068	0.006	0.002	0.002	0.011	2.690	0.0072
Intervention	0.015	0.027	-0.038	0.068	0.550	0.5817	0.046	0.028	-0.009	0.102	1.630	0.1032
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.226	0.017	0.192	0.260	13.130	<.0001	0.229	0.017	0.196	0.261	13.830	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.103	0.063	-0.226	0.020	-1.640	0.1006
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 19. General Estimating Equation negative binomial model estimates and p-values for total inpatient facility and ED events for the LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-4.307	0.252	-4.800	-3.813	-17.110	<.0001	-4.312	0.250	-4.802	-3.821	-17.230	<.0001
MTM-P	-0.034	0.086	-0.202	0.134	-0.400	0.6928	-0.023	0.093	-0.206	0.159	-0.250	0.8025
MTM-NP	.	.	.	.	.	.	.	.	.	.	.	.
Female	0.084	0.066	-0.047	0.214	1.260	0.208	0.084	0.066	-0.046	0.214	1.260	0.2068
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	0.096	0.091	-0.081	0.274	1.070	0.2867	0.097	0.091	-0.081	0.274	1.070	0.2868
Hispanic	-0.022	0.090	-0.199	0.155	-0.240	0.8101	-0.022	0.091	-0.200	0.156	-0.240	0.8104
Other	0.122	0.104	-0.082	0.325	1.170	0.2427	0.121	0.104	-0.083	0.325	1.160	0.2441
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	-0.016	0.003	-0.023	-0.009	-4.670	<.0001	-0.016	0.003	-0.023	-0.009	-4.670	<.0001
Intervention	-0.345	0.063	-0.469	-0.221	-5.440	<.0001	-0.337	0.071	-0.476	-0.197	-4.730	<.0001
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
Died	-0.813	0.143	-1.093	-0.534	-5.700	<.0001	-0.812	0.143	-1.091	-0.533	-5.700	<.0001
Alive	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.541	0.024	0.495	0.587	23.010	<.0001	0.541	0.023	0.495	0.587	23.090	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.036	0.154	-0.338	0.267	-0.230	0.817
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 20. General Estimating Equation negative binomial model estimates and p-values for total inpatient facility and ED events for the STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-4.7444	0.345	-5.420	-4.069	-13.770	<.0001	-4.724	0.345	-5.400	-4.047	-13.680	<.0001
MTM-P	-0.0642	0.141	-0.340	0.212	-0.460	0.6488	-0.131	0.160	-0.445	0.183	-0.820	0.4141
MTM-NP	.	.	.	.	.	.	.	.	.	.	.	.
Female	0.2977	0.123	0.057	0.538	2.420	0.0153	0.298	0.123	0.057	0.540	2.420	0.0154
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.0124	0.164	-0.335	0.310	-0.080	0.9399	-0.015	0.164	-0.337	0.307	-0.090	0.9267
Hispanic	-0.1569	0.156	-0.462	0.148	-1.010	0.3136	-0.158	0.156	-0.464	0.148	-1.010	0.312
Other	-0.0815	0.207	-0.487	0.324	-0.390	0.6936	-0.087	0.205	-0.489	0.315	-0.420	0.6727
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	-0.032	0.006	-0.044	-0.020	-5.110	<.0001	-0.032	0.006	-0.044	-0.020	-5.110	<.0001
Intervention	0.2607	0.092	0.081	0.440	2.840	0.0045	0.224	0.102	0.023	0.424	2.190	0.0288
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.5465	0.038	0.473	0.620	14.510	<.0001	0.545	0.038	0.471	0.618	14.460	<.0001
MTM-P by Intervention	.	.	.	.	.	.	0.134	0.221	-0.299	0.566	0.610	0.5443
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 21. General Estimating Equation negative binomial model estimates and p-values for total outpatient prescriptions for the LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-2.758	0.129	-3.011	-2.505	-21.360	<.0001	-2.767	0.129	-3.019	-2.514	-21.480	<.0001
MTM-P	0.038	0.039	-0.038	0.114	0.980	0.327	0.052	0.041	-0.029	0.133	1.260	0.2087
MTM-NP	.	.	.	.	.	.	.	.	.	.	.	.
Female	0.253	0.037	0.180	0.326	6.810	<.0001	0.254	0.037	0.181	0.326	6.820	<.0001
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.113	0.049	-0.209	-0.017	-2.300	0.0215	-0.112	0.049	-0.208	-0.016	-2.290	0.022
Hispanic	-0.025	0.053	-0.128	0.078	-0.480	0.6317	-0.025	0.053	-0.128	0.078	-0.480	0.6309
Other	-0.054	0.055	-0.162	0.054	-0.990	0.3242	-0.055	0.055	-0.163	0.053	-1.000	0.318
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	0.009	0.002	0.006	0.012	5.380	<.0001	0.009	0.002	0.006	0.012	5.380	<.0001
Intervention	0.092	0.022	0.050	0.135	4.260	<.0001	0.103	0.025	0.055	0.152	4.160	<.0001
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
Died	-0.006	0.089	-0.181	0.169	-0.070	0.9477	-0.001	0.089	-0.176	0.173	-0.020	0.9873
Alive	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.161	0.012	0.137	0.186	12.950	<.0001	0.162	0.012	0.137	0.186	13.040	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.046	0.050	-0.143	0.051	-0.920	0.3561
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 22. General Estimating Equation negative binomial model estimates and p-values for total outpatient prescriptions for the STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model						Difference in Difference (Interaction) Model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > Chi-Sq	EST	SE	95% LCL	95% UCL	Z	Pr > |Z|
Intercept	-2.7024	0.132	-2.960	-2.445	-20.540	<.0001	-2.712	0.132	-2.970	-2.454	-20.590	<.0001
MTM-P	-0.0623	0.044	-0.149	0.025	-1.410	0.1597	-0.033	0.050	-0.131	0.065	-0.660	0.5091
MTM-NP	.	.	.	.	.	.	.	.	.	.	.	.
Female	0.1427	0.051	0.043	0.242	2.810	0.005	0.144	0.051	0.044	0.243	2.830	0.0046
Male	.	.	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.0481	0.069	-0.184	0.088	-0.690	0.4876	-0.047	0.069	-0.183	0.089	-0.670	0.5016
Hispanic	-0.0886	0.069	-0.224	0.047	-1.280	0.2014	-0.091	0.069	-0.226	0.045	-1.310	0.1903
Other	0.0135	0.070	-0.123	0.150	0.190	0.8464	0.013	0.070	-0.124	0.149	0.180	0.8533
White or European American	.	.	.	.	.	.	.	.	.	.	.	.
Age	0.0142	0.002	0.010	0.019	6.080	<.0001	0.014	0.002	0.010	0.019	6.070	<.0001
Intervention	0.0349	0.025	-0.015	0.084	1.380	0.1662	0.057	0.030	-0.001	0.115	1.920	0.0551
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.1206	0.015	0.092	0.150	8.110	<.0001	0.123	0.014	0.095	0.152	8.540	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.071	0.054	-0.177	0.035	-1.320	0.1864
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Tables for Evaluation Question 2: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG 1 (MTM-NP), and CG 2 for expenditure measures?

Descriptive Tables See tables for EQ1

Regression Models

Table 23. Robust log-level linear regression difference in difference model estimates and p-values for a model of total recipient expenditures for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Label	Base Model						Difference in Difference (interaction) model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq
Intercept	2.65	0.14	2.38	2.91	374.63	<.0001	2.65	0.14	2.38	2.91	371.38	<.0001
MTM-P	-0.01	0.06	-0.13	0.11	0.04	0.8475	-0.01	0.07	-0.15	0.14	0.01	0.9313
MTM-NP	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Female	-0.06	0.05	-0.16	0.04	1.38	0.2397	-0.06	0.05	-0.16	0.04	1.38	0.2396
Male	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Black or African American	0.09	0.07	-0.04	0.21	1.67	0.1961	0.09	0.07	-0.04	0.22	1.67	0.1963
Hispanic	0.10	0.07	-0.04	0.23	2.02	0.1553	0.10	0.07	-0.04	0.23	2.01	0.1565
Other	0.13	0.07	-0.01	0.28	3.21	0.0731	0.13	0.07	-0.01	0.28	3.2	0.0736
White or European American	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Age	0.00	0.00	-0.01	0.00	0.98	0.3215	0.00	0.00	-0.01	0.00	0.98	0.3223
Intervention	-0.25	0.05	-0.35	-0.14	21.75	<.0001	-0.24	0.06	-0.36	-0.13	16.35	<.0001
Pre-Intervention	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Died	1.50	0.17	1.16	1.83	76.52	<.0001	1.50	0.17	1.16	1.83	76.4	<.0001
Alive	0.00	.	.	.	.	.	0.00	.	.	.	.	.
ACG Risk Weight	0.66	0.02	0.62	0.71	846.97	<.0001	0.66	0.02	0.62	0.71	846.01	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.02	0.12	-0.26	0.23	0.02	0.9023
MTM-P by Pre-Intervention	.	.	.	.	.	.	0.00	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	0.00	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	0.00	.	.	.	.	.

Table 24. Robust log-level linear regression difference in difference model estimates and p-values for a model of total recipient expenditures for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Label	Base Model						Difference in Difference (interaction) model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq
Intercept	2.78	0.20	2.39	3.16	201.59	<.0001	2.80	0.20	2.41	3.18	201.73	<.0001
MTM-P	-0.09	0.08	-0.24	0.06	1.51	0.2196	-0.15	0.10	-0.34	0.05	2.11	0.1463
MTM-NP												
Female	-0.01	0.07	-0.15	0.12	0.03	0.8603	-0.02	0.07	-0.15	0.12	0.05	0.8174
Male	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Black or African American	-0.01	0.09	-0.18	0.16	0.01	0.9094	-0.01	0.09	-0.19	0.16	0.02	0.8919
Hispanic	0.06	0.09	-0.12	0.24	0.46	0.4993	0.06	0.09	-0.12	0.24	0.48	0.4863
Other	0.02	0.10	-0.18	0.21	0.04	0.8435	0.02	0.10	-0.17	0.22	0.05	0.8232
White or European American	.	.	.	.	.	.	.			.	.	.
Age	-0.01	0.00	-0.01	0.00	2.32	0.1279	-0.01	0.00	-0.01	0.00	2.31	0.1283
Intervention	0.06	0.07	-0.07	0.19	0.82	0.3646	0.03	0.08	-0.13	0.18	0.12	0.7253
Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.53	0.03	0.47	0.58	336.14	<.0001	0.53	0.03	0.47	0.58	332.03	<.0001
MTM-P by Intervention	.	.	.	.	.	.	0.12	0.15	-0.17	0.41	0.64	0.4223
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.	.	.

Table 25. Robust log-level linear regression difference in difference model estimates and p-values for a model of total recipient pharmacy expenditures for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Label	Base Model						Difference in Difference (interaction) model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq
	0.60	0.20	0.22	0.99	9.37	0.0022	0.60	0.20	0.21	0.99	9.17	0.0025
MTM-P	0.22	0.09	0.05	0.39	6.53	0.0106	0.24	0.11	0.03	0.45	5.13	0.0235
MTM-NP	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Female	0.32	0.07	0.18	0.46	19.47	<.0001	0.32	0.07	0.18	0.46	19.49	<.0001
Male	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Black or African American	-0.09	0.10	-0.27	0.10	0.84	0.3590	-0.09	0.10	-0.27	0.10	0.84	0.3592
Hispanic	0.01	0.10	-0.19	0.20	0.00	0.9437	0.01	0.10	-0.19	0.20	0	0.9483
Other	-0.08	0.11	-0.29	0.13	0.56	0.4527	-0.08	0.11	-0.29	0.13	0.58	0.4466
White or European American	0.00	.	.	.	.	.	0.00	.	.	.	.	.
	0.00	0.00	-0.01	0.01	0.13	0.7221	0.00	0.00	-0.01	0.01	0.13	0.7222
Intervention	0.35	0.08	0.20	0.50	20.68	<.0001	0.36	0.09	0.19	0.53	17.2	<.0001
Pre Intervention	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Died	-0.42	0.25	-0.91	0.06	2.97	0.0851	-0.43	0.25	-0.91	0.06	3.01	0.0826
Alive	0.00	.	.	.	.	.	0.00	.	.	.	.	.
	0.42	0.03	0.36	0.49	163.42	<.0001	0.42	0.03	0.36	0.49	163.52	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.05	0.18	-0.41	0.30	0.09	0.7642
MTM-P by Pre-Intervention	.	.	.	.	.	.	0	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	0	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	0	.	.	.	.	.

Table 26. Robust log-level linear regression difference in difference model estimates and p-values for a model of total recipient pharmacy expenditures for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Label	Base Model						Difference in Difference (interaction) model					
	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq	EST	SE	95% LCL	95% UCL	Chi-Square	Pr > ChiSq
	1.19	0.30	0.60	1.77	15.92	<.0001	1.16	0.30	0.58	1.75	15.1	0.0001
MTM-P	-0.11	0.11	-0.33	0.12	0.89	0.3447	-0.04	0.15	-0.34	0.26	0.07	0.7914
MTM-NP	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Female	0.13	0.10	-0.07	0.34	1.59	0.2075	0.13	0.10	-0.07	0.34	1.63	0.2021
Male	0.00	.	.	.	.	.	0.00	.	.	.	.	.
Black or African American	0.06	0.14	-0.20	0.33	0.20	0.6554	0.06	0.14	-0.20	0.33	0.22	0.6376
Hispanic	-0.03	0.14	-0.31	0.24	0.05	0.8149	-0.04	0.14	-0.31	0.24	0.07	0.798
Other	0.20	0.15	-0.09	0.50	1.77	0.1828	0.20	0.15	-0.10	0.49	1.74	0.1868
White or European American	0.00	.	.	.	.	.	0.00	.	.	.	.	.
	0.00	0.01	-0.01	0.01	0.06	0.8025	0.00	0.01	-0.01	0.01	0.06	0.7994
Intervention	0.04	0.10	-0.16	0.23	0.12	0.7268	0.08	0.12	-0.16	0.31	0.43	0.5129
Pre Intervention	0.00	.	.	.	.	.	0.00	.	.	.	.	.
ACG score	0.33	0.04	0.25	0.42	57.25	<.0001	0.33	0.04	0.25	0.42	57.87	<.0001
MTM-P by Intervention	.	.	.	.	.	.	-0.15	0.22	-0.58	0.29	0.43	0.5104
MTM-P by Pre-Intervention	.	.	.	.	.	.	0	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	0	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	0	.	.	.	.	.

Propensity Score Models for Total Reimbursement and Pharmacy Reimbursement

Table 27. Propensity score models for pharmaceutical reimbursements for LENIENT and STRICT MTM participant and CG 2, Florida MTM program June 1, 2010 - May 31, 2014

I. Pharmacy Reimbursements - Lenient			
Match Criteria[1]			
	Average Treatment Effect	Std. Err.	t-statistic
Base Model			
Local Weight	-841.41	986.61	-0.85*
Rescaled Weight	-1,475.96	826.47	-1.79*
Year[2], LOE[3]			
Local Weight	76.23	1251.45	0.06*
Rescaled Weight	1064.37	1113.59	0.96*
Year			
Local Weight	-791.15	727.68	-1.09*
Rescaled Weight	-785.93	643.84	-1.22*
II. Pharmacy Reimbursements - Strict			
Match Criteria			
	Average Treatment Effect	Std. Err.	t-statistic
Base Model			
Local Weight	-875.20	1187.29	-0.74*
Rescaled Weight	-852.51	1108.00	-0.77*
Year, LOE			
Local Weight	833.02	1025.04	0.81*
Rescaled Weight	865.59	1262.92	0.69*
Year			
Local Weight	152.06	1433.03	0.11*
Rescaled Weight	-486.04	1247.36	-0.39*

[1]The 'Base Model' analysis used gender and age as the matching criteria and either the local or rescaled weight as noted. Other results in the table include matching on those variables listed in addition to the Base Model covariates.

[2]Year = the year of participation in the MEDs-AD Waiver program.

[3]LOE = Differences in the length of enrollment in the MEDs-AD Waiver program by year.

* Not statistically significant

Table 28. Propensity score models for total reimbursements for LENIENT and STRICT MTM participant and CG 2, Florida MTM program June 1, 2010 - May 31, 2014

I. Total Reimbursements - Lenient			
Match Criteria[1]			
	Average Treatment Effect	Std. Err.	t-statistic
Base Model			
Local Weight	-3208.83	2286.81	-1.40*
Rescaled Weight	-6617.29	3716.20	-1.78*
Year[2], LOE[3]			
Local Weight	-3660.91	3167.41	-1.16*
Rescaled Weight	-1879.06	3230.69	-0.58*
Year			
Local Weight	-4938.88	2818.72	-1.75*
Rescaled Weight	-5282.91	2166.12	-2.50
II. Total Reimbursements - Strict			
Match Criteria			
	Average Treatment Effect	Std. Err.	t-statistic
Base Model			
Local Weight	-3153.22	3140.14	-1.00*
Rescaled Weight	-4572.49	2847.36	-1.61*
Year, LOE			
Local Weight	-5651.55	4522.70	-1.25*
Rescaled Weight	427.44	2004.80	0.21*
Year			
Local Weight	-1642.55	3118.59	-0.53*
Rescaled Weight	-4206.87	3826.48	-1.10*

[1]The 'Base Model' analysis used gender and age as the matching criteria and either the local or rescaled weight as noted. Other results in the table include matching on those variables listed in addition to the Base Model covariates.

[2]Year = the year of participation in the MEDs-AD Waiver program.

[3]LOE = Differences in the length of enrollment in the MEDs-AD Waiver program by year.

* Not statistically significant

Tables for Evaluation Question 3: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG 1 (MTM-NP), and CG 2 for clinical outcomes?

Descriptive Tables EQ 3

Table 29. Mean Continuous Single-Interval Measure of Availability (CSA) medication adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Mean CSA	Min CSA	Max CSA	Lower 95% CSA	Upper 95% CSA
MTM-P	SP-PRI	196	1.05	0.40	7.47	0.96	1.13
MTM-NP	SP-PRI	567	1.05	0.37	5.70	1.01	1.10
Sub-Total	SP-PRI	763	1.05	0.37	7.47	1.01	1.09
MTM-P	SP-INT	117	1.00	0.60	3.36	0.94	1.07
MTM-NP	SP-INT	344	1.03	0.53	8.35	0.97	1.09
Sub-Total	SP-INT	461	1.02	0.53	8.35	0.98	1.07
MTM-P	ALL	313	1.03	0.40	7.47	0.97	1.09
MTM-NP	ALL	911	1.05	0.37	8.35	1.01	1.08
Total	ALL	1224	1.04	0.37	8.35	1.01	1.07

Table 30. Mean Continuous Single-Interval Measure of Availability (CSA) medication adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Mean CSA	Min CSA	Max CSA	Lower 95% CSA	Upper 95% CSA
MTM-P	SP-PRI	105	1.05	0.44	7.47	0.91	1.18
MTM-NP	SP-PRI	269	1.01	0.37	4.37	0.96	1.06
Sub-Total	SP-PRI	374	1.02	0.37	7.47	0.97	1.07
MTM-P	SP-INT	88	1.05	0.65	4.00	0.96	1.15
MTM-NP	SP-INT	197	1.03	0.46	8.35	0.95	1.12
Sub-Total	SP-INT	285	1.04	0.46	8.35	0.97	1.11
MTM-P	ALL	193	1.05	0.44	7.47	0.97	1.14
MTM-NP	ALL	466	1.02	0.37	8.35	0.97	1.07
Total	ALL	659	1.03	0.37	8.35	0.99	1.07

Table 31. Mean Medication Possession Ratio (MPR) adherence score the 17 chronic conditions tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Mean MPR	Min MPR	Max MPR	Lower 95% MPR	Upper 95% MPR
MTM-P	SP-PRI	196	0.89	0.40	2.00	0.86	0.91
MTM-NP	SP-PRI	567	0.89	0.35	2.55	0.87	0.90
Sub-Total	SP-PRI	763	0.89	0.35	2.55	0.87	0.90
MTM-P	SP-INT	117	0.88	0.41	1.55	0.84	0.91
MTM-NP	SP-INT	344	0.87	0.41	1.82	0.85	0.89
Sub-Total	SP-INT	461	0.87	0.41	1.82	0.86	0.89
MTM-P	ALL	313	0.88	0.40	2.00	0.86	0.90
MTM-NP	ALL	911	0.88	0.35	2.55	0.87	0.89
Total	ALL	1224	0.88	0.35	2.55	0.87	0.89

Table 32. Mean Medication Possession Ratio (MPR) adherence score for the 17 chronic conditions tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Mean MPR	Min MPR	Max MPR	Lower 95% MPR	Upper 95% MPR
MTM-P	SP-PRI	105	0.87	0.41	1.72	0.83	0.90
MTM-NP	SP-PRI	269	0.88	0.35	2.55	0.85	0.90
Sub-Total	SP-PRI	374	0.88	0.35	2.55	0.85	0.90
MTM-P	SP-INT	88	0.89	0.56	1.36	0.87	0.92
MTM-NP	SP-INT	197	0.87	0.44	1.43	0.85	0.89
Sub-Total	SP-INT	285	0.88	0.44	1.43	0.86	0.89
MTM-P	ALL	193	0.88	0.41	1.72	0.86	0.90
MTM-NP	ALL	466	0.87	0.35	2.55	0.86	0.89
Total	ALL	659	0.88	0.35	2.55	0.86	0.89

Regression Models EQ 3

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-5.63	0.51	122.39	<.0001	0	-5.62	0.51	122.3	<.0001	0
MTM-P	-0.25	0.13	3.37	0.0663	0.78	-0.26	0.15	2.89	0.09	0.77
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	-0.2	0.11	3.36	0.0667	0.82	-0.2	0.11	3.36	0.07	0.82
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.25	0.14	3.17	0.0749	1.29	0.25	0.14	3.18	0.07	1.29
Hispanic	-0.15	0.16	0.95	0.3308	0.86	-0.15	0.16	0.93	0.33	0.86
Other	0.05	0.16	0.1	0.7515	1.05	0.05	0.16	0.1	0.75	1.05
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.01	0.01	3.9	0.0483	1.01	0.01	0.01	3.91	0.05	1.01
Intervention	-1.32	0.13	97.11	<.0001	0.27	-1.33	0.15	77.69	<.0001	0.26
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
Died	-2.47	0.4	37.9	<.0001	0.08	-2.47	0.4	37.92	<.0001	0.08
Alive	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	1.05	0.05	445.12	<.0001	2.84	1.04	0.05	444.51	<.0001	2.84
MTM-P by Intervention	.	.	.	.	.	0.06	0.31	0.03	**0.85**	1.06
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 34. Logistic regression model estimates and p-values for odds of one or more discharges from an inpatient hospital for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-8.29	0.55	226.39	<.0001	0.00	-8.08	0.57	199.03	<.0001	0.00
MTM-P	-0.24	0.21	1.26	0.2614	0.79	-0.53	0.29	3.24	0.0718	0.59
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	0.14	0.19	0.51	0.474	1.15	-0.13	0.19	0.45	0.5041	0.88
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.03	0.25	0.01	0.9131	1.03	0.03	0.25	0.01	0.91	1.03
Hispanic	0.01	0.24	0.00	0.9794	1.01	0.02	0.24	0.01	0.9404	1.02
Other	-0.64	0.29	4.71	0.03	0.53	-0.64	0.30	4.67	0.0307	0.53
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.00	0.01	0.01	0.9183	1.00	0.00	0.01	0.01	0.903	1.00
Intervention	-0.10	0.18	0.28	0.5956	0.91	-0.27	0.22	1.50	0.2199	0.77
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.95	0.07	172.89	<.0001	2.58	0.94	0.07	170.93	<.0001	2.57
MTM-P by Intervention	.	.	.	.	.	0.62	0.42	2.23	0.1351	1.86
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 35. Logistic regression model estimates and p-values for odds of one or more discharges from a hospital ED for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-5.30	0.40	176.03	<.0001	0.01	-5.31	0.40	176.29	<.0001	0.00
MTM-P	-0.15	0.11	2.05	0.1522	0.86	-0.10	0.13	0.62	0.4327	0.90
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	0.40	0.09	19.40	<.0001	1.48	0.40	0.09	19.50	<.0001	1.49
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.04	0.12	0.10	0.7542	1.04	0.04	0.12	0.10	0.7535	1.04
Hispanic	-0.02	0.12	0.02	0.8759	0.98	-0.02	0.12	0.03	0.8672	0.98
Other	-0.10	0.13	0.57	0.452	0.91	-0.10	0.13	0.58	0.4455	0.90
White or European American	.	.	.	.	.	.	.	.	.	.
Age	-0.02	0.00	29.13	<.0001	0.98	-0.02	0.00	29.08	<.0001	0.98
Intervention	-0.21	0.09	4.92	0.0266	0.81	-0.17	0.11	2.66	0.103	0.84
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
Died	-0.17	0.31	0.29	0.5913	0.85	-0.17	0.31	0.29	0.5918	0.85
Alive	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.53	0.04	159.74	<.0001	1.70	0.53	0.04	160.07	<.0001	1.70
MTM-P by Intervention	.	.	.	.	.	-0.15	0.22	0.48	0.4907	0.86
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 36. Logistic regression model estimates and p-values for odds of one or more discharges from a hospital ED for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-5.35	0.40	179.03	<.0001	0.00	-4.75	0.42	129.73	<.0001	0.01
MTM-P	-0.15	0.16	0.93	0.3348	0.86	-0.22	0.21	1.04	0.3085	0.81
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	0.59	0.15	15.85	<.0001	1.79	-0.58	0.15	15.76	<.0001	0.56
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.10	0.19	0.26	0.608	0.91	-0.10	0.19	0.27	0.6021	0.91
Hispanic	-0.38	0.19	3.81	0.051	0.69	-0.37	0.19	3.77	0.0522	0.69
Other	-0.17	0.21	0.69	0.4061	0.84	-0.17	0.21	0.69	0.407	0.84
White or European American	.	.	.	.	.	.	.	.	.	.
Age	-0.03	0.01	18.50	<.0001	0.97	-0.03	0.01	18.54	<.0001	0.97
Intervention	0.20	0.14	2.13	0.1441	1.22	0.16	0.16	1.00	0.3176	1.18
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.54	0.06	71.23	<.0001	1.72	0.54	0.06	70.71	<.0001	1.72
MTM-P by Intervention	.	.	.	.	.	0.14	0.31	0.21	0.6506	1.15
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 37. Logistic regression model estimates and p-values for odds of one or more AHRQ ACSC discharges from an inpatient hospital for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-5.63	0.51	122.39	<.0001	0	-5.62	0.51	122.3	<.0001	0
MTM-P	-0.25	0.13	3.37	0.0663	0.78	-0.26	0.15	2.89	0.09	0.77
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	-0.2	0.11	3.36	0.0667	0.82	-0.2	0.11	3.36	0.07	0.82
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.25	0.14	3.17	0.0749	1.29	0.25	0.14	3.18	0.07	1.29
Hispanic	-0.15	0.16	0.95	0.3308	0.86	-0.15	0.16	0.93	0.33	0.86
Other	0.05	0.16	0.1	0.7515	1.05	0.05	0.16	0.1	0.75	1.05
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.01	0.01	3.9	0.0483	1.01	0.01	0.01	3.91	0.05	1.01
Intervention	-1.32	0.13	97.11	<.0001	0.27	-1.33	0.15	77.69	<.0001	0.26
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
Died	-2.47	0.4	37.9	<.0001	0.08	-2.47	0.4	37.92	<.0001	0.08
Alive	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	1.05	0.05	445.12	<.0001	2.84	1.04	0.05	444.51	<.0001	2.84
MTM-P by Intervention	.	.	.	.	.	0.06	0.31	0.03	**0.85**	1.06
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 38. Logistic regression model estimates and p-values for odds of one or more AHRQ ACSC discharges from an inpatient hospital for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-8.29	0.55	226.39	<.0001	0.00	-8.08	0.57	199.03	<.0001	0.00
MTM-P	-0.24	0.21	1.26	0.2614	0.79	-0.53	0.29	3.24	0.0718	0.59
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	0.14	0.19	0.51	0.474	1.15	-0.13	0.19	0.45	0.5041	0.88
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.03	0.25	0.01	0.9131	1.03	0.03	0.25	0.01	0.91	1.03
Hispanic	0.01	0.24	0.00	0.9794	1.01	0.02	0.24	0.01	0.9404	1.02
Other	-0.64	0.29	4.71	0.03	0.53	-0.64	0.30	4.67	0.0307	0.53
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.00	0.01	0.01	0.9183	1.00	0.00	0.01	0.01	0.903	1.00
Intervention	-0.10	0.18	0.28	0.5956	0.91	-0.27	0.22	1.50	0.2199	0.77
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	0.95	0.07	172.89	<.0001	2.58	0.94	0.07	170.93	<.0001	2.57
MTM-P by Intervention	.	.	.	.	.	0.62	0.42	2.23	0.1351	1.86
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

I. Inpatient Visits – Lenient			
Match Criteria[1]			
	Average Treatment Effect	Std. Err.	P > |t|
Base Model			
Local Weight	-0.896	0.058	0.08*
Rescaled Weight	-0.106	0.051	0.07*
Year[2], LOE[3]			
Local Weight	-0.763	0.611	0.21*
Rescaled Weight	-0.891	0.614	0.15*
Year			
Local Weight	-0.175	0.651	0.27*
Rescaled Weight	-0.152	0.689	0.22*
II. Inpatient Visits – Strict			
Match Criteria			
	Average Treatment Effect	Std. Err.	P > |t|
Base Model			
Local Weight	-0.125	0.071	1.76*
Rescaled Weight	-0.118	0.102	1.15*
Year, LOE			
Local Weight	-0.656	0.092	0.47*
Rescaled Weight	-0.337	0.079	0.67*
Year			
Local Weight	-0.148	0.105	1.41*
Rescaled Weight	-0.103	0.112	0.92*

Table 40. Propensity score model for one or more ED events for LENIENT and STRICT MTM participant and CG 2, Florida MTM program June 1, 2010 - May 31, 2014

I. Emergency Room Visits - Lenient			
Match Criteria[1]			
	Average Treatment Effect	Std. Err.	P > |t|
Base Model			
Local Weight	0.061	0.062	0.98*
Rescaled Weight	0.056	0.053	0.29*
Year[2], LOE[3]			
Local Weight	0.057	0.085	0.50*
Rescaled Weight	0.102	0.077	0.19*
Year			
Local Weight	0.027	0.051	0.59*
Rescaled Weight	0.028	0.054	0.60*
II. Emergency Room Visits - Strict			
Match Criteria			
	Average Treatment Effect	Std. Err.	P > |t|
Base Model			
Local Weight	0.045	0.067	0.50*
Rescaled Weight	0.062	0.057	0.28*
Year, LOE			
Local Weight	0.089	0.086	0.30*
Rescaled Weight	0.105	0.079	1.32*
Year			
Local Weight	0.151	0.090	0.09*
Rescaled Weight	0.124	0.064	0.06*

Tables for Evaluation Question 4: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG 1 (MTM-NP), and CG 2 for demographic categories?

Age

Table 41. Frequency and proportion of patients categorized by age on the last day of the pre-intervention study period in NOMINAL Cohorts 1, 2, and 3 for the MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Age Categories	Frequency Cohort 1	Pct. Cohort 1	Frequency Cohort 2	Pct. Cohort 2	Frequency Cohort 3	Pct. Cohort 3	Total All 3 Cohorts	Pct. All 3 Cohorts	P-value, Binomial (Two-sided) Cohort 1 vs. 2	P-value Binomial (Two-sided) Cohort 1 vs. 3	P-value Binomial (Two-sided) Cohort 2 vs. 3
MTM-P	< 20	1	0.7	0	0	2	1.5	3	0.7	0.267	0.267	-
MTM-P	21 - 40	13	8.8	17	9.9	16	11.7	46	10.1	0.613	0.242	0.497
MTM-P	41 - 50	32	21.8	26	15.2	28	20.4	86	18.9	0.038	0.706	0.088
MTM-P	51 - 55	38	25.9	50	29.2	33	24.1	121	26.6	0.311	0.637	0.185
MTM-P	56 - 60	38	25.9	39	22.8	24	17.5	101	22.2	0.363	0.026	0.140
MTM-P	61 - 65	25	17.0	39	22.8	33	24.1	97	21.3	0.044	0.027	0.721
MTM-P	> 65	0	0.0	0	0.0	1	0.7	1	0.2	.	.	.
MTM-P	Group Sub-total	147	100.0	171	100.0	137	100.0	455	100.0	.	.	.
MTM-NP	< 20	1	0.2	8	2.5	2	0.3	11	0.7	0.000	0.617	0.000
MTM-NP	21 - 40	66	13.1	60	18.5	95	13.4	221	14.4	0.004	0.810	0.000
MTM-NP	41 - 50	109	21.6	87	26.9	168	23.7	364	23.7	0.022	0.181	0.058
MTM-NP	51 - 55	92	18.3	52	16.0	152	21.4	296	19.3	0.304	0.028	0.000
MTM-NP	56 - 60	111	22.0	59	18.2	164	23.1	334	21.7	0.098	0.477	0.001
MTM-NP	61 - 65	124	24.6	58	17.9	120	16.9	302	19.6	0.005	.	0.498
MTM-NP	> 65	1	0.2	0	0.0	8	1.1	9	0.6	0.000	.	.
MTM-NP	Group Sub-total	504	100.0	324	100.0	709	100.0	1,537	100.0	.	.	.
	Grand Total	651	.	495	.	846	.	1,992	.	.	.	.

Race and Ethnicity

Table 42. Frequency and proportion of patients categorized by race and ethnicity in NOMINAL Cohorts 1, 2 and 3 initial study population for the MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 – May 31, 2014

Study Group	Age Categories	Frequency Cohort 1	Pct. Cohort 1	Frequency Cohort 2	Pct. Cohort 2	Frequency Cohort 3	Pct. Cohort 3	Total All 3 Cohorts	Pct. All 3 Cohorts	P-value, Binomial (Two-sided) Cohort 1 vs. 2	P-value Binomial (Two-sided) Cohort 1 vs. 3	P-value Binomial (Two-sided) Cohort 2 vs. 3
MTM-P	Black or African American	32	21.8	58	33.9	37	27.0	127	27.9	0.000	0.137	0.088
MTM-P	Hispanic	7	4.8	12	7.0	13	9.5	32	7.0	0.166	0.009	0.257
MTM-P	Other*	17	11.6	17	9.9	13	9.5	47	10.3	0.507	0.447	0.860
MTM-P	White or European American	91	61.9	84	49.1	74	54.0	249	54.7	0.001	0.057	0.252
MTM-P	Group Sub-total	147	.	171	.	137	.	455	.	.	.	.
MTM-NP	Black or African American	110	21.8	81	25.0	158	22.3	349	22.7	0.167	0.767	0.095
MTM-NP	Hispanic	101	20.0	68	21.0	132	18.6	301	19.6	0.670	0.344	0.121
MTM-NP	Other*	69	13.7	47	14.5	120	16.9	236	15.4	0.669	0.012	0.067
MTM-NP	White or European American	224	44.4	128	39.5	299	42.2	651	42.3	0.074	0.223	0.146
MTM-NP	Group Sub-total	504	.	324	.	709	.	1537	.	.	.	.
	Grand Total	651	.	495	.	846	.	1992	.	.	.	.

*Asian, Alaskan Native, Other Race and Undetermined Race are combined in the Other Race category

Gender

Table 43. Frequency and proportion of patients categorized by gender in NOMINAL Cohorts 1, 2 and 3 initial study population for the MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 – May 31, 2014

Study Group	Gender	Frequency Cohort 1	Pct. Cohort 1	Frequency Cohort 2	Pct. Cohort 2	Frequency Cohort 3	Pct. Cohort 3	Total All 3 Cohorts	Pct. All 3 Cohorts	P-value, Binomial (Two-sided) Cohort 1 vs. 2	P-value Binomial (Two-sided) Cohort 1 vs. 3	P-value Binomial (Two-sided) Cohort 2 vs. 3
MTM-P	Female	83	56.5	93	54.4	74	54.0	250	0.55	0.584	0.563	0.930
MTM-P	Male	64	43.5	78	45.6	63	46.0	205	0.45	0.584	0.563	0.930
MTM-P	Group Sub-total	147	.	171	.	137	.	455	.	.	.	.
MTM-NP	Female	298	59.1	212	65.4	352	49.6	862	0.56	0.021	0.000	0.000
MTM-NP	Male	206	40.9	112	34.6	355	50.1	673	0.44	0.021	0.000	0.000
MTM-NP	Unknown	0	.	0	.	2	0.3	2	0.00	.	.	.
MTM-NP	Group Sub-total	504	.	324	.	709	.	1537	.	.	.	.
	Grand Total	651	.	495	.	846	.	1992	.	.	.	.

Language

Table 44. Frequency and proportion of patients categorized by language preference in NOMINAL Cohorts 1, 2 and 3 for the initial MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 – May 31, 2014

Study Group	Language Preference	Frequency Cohort 1	Pct. Cohort 1	Frequency Cohort 2	Pct. Cohort 2	Frequency Cohort 3	Pct. Cohort 3	Total All 3 Cohorts	Pct. All 3 Cohorts	P-value, Binomial (Two-sided) Cohort 1 vs. 2	P-value Binomial (Two-sided) Cohort 1 vs. 3	P-value Binomial (Two-sided) Cohort 2 vs. 3
MTM-P	English	138	93.9	158	92.4	129	94.2	425	93.4	0.420	0.890	0.436
MTM-P	Spanish	7	4.8	10	5.8	7	5.1	24	5.3	0.505	0.848	0.361
MTM-P	Other Language	2	1.4	3	1.8	1	0.7	6	1.3	0.657	0.524	0.713
MTM-P	Group Sub-total	147	.	171	.	137	.	455	.	.	.	.
MTM-NP	English	420	83.3	260	80.2	611	86.2	1291	84.0	0.136	0.042	0.000
MTM-NP	Spanish	76	15.1	58	17.9	89	12.6	223	14.5	0.156	0.060	0.250
MTM-NP	Other Language	8	1.6	6	1.9	9	1.3	23	1.5	0.703	0.498	0.000
MTM-NP	Group Sub-total	504	.	324	.	709	.	1537	.	.	.	.
	Grand Total	651	.	495	.	846	.	1992	.	.	.	.

Tables for Evaluation Question 5: What are the differences in the pre-intervention and intervention periods between the intervention group (MTM-P), CG 1 (MTM-NP), and CG 2 for mortality and morbidity measures?

DESCRIPTIVE TABLES EQ5

Table 45. Summary statistics for number of deaths and annualized mortality rate applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study Group	Study Period	No. Recipients	Number of Deaths	Sum Enrolled Days	Death Rate Per Year	95% LCL	95% UCL
MTM-NP	SP-PRI	1,265	16	378,932	0.015	0.015	0.016
MTM-P	SP-PRI	363	0	114,883	0.000	.	.
Sub-Total	SP-PRI	1,628	16	493,815	0.012	0.011	0.013
MTM-NP	SP-INT	639	32	211,325	0.055	0.054	0.057
MTM-P	SP-INT	191	7	63,421	0.040	0.037	0.045
Sub-Total	SP-INT	830	39	274,746	0.052	0.051	0.053
MTM-NP	All Periods	1,904	48	590,257	0.030	0.029	0.030
MTM-P	All Periods	554	7	178,304	0.014	0.013	0.016
Total	All Periods	2,458	55	768,561	0.026	0.026	0.027

Table 46. Summary statistics for number of persons with two or more chronic conditions (MCC) as tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study	Study Period	No. Recipients	Number of Persons with MCC	Percent of Persons with MCC	Binomial Test of Proportion MTM-P vs. MTM-NP	
					z	Pr < Z
MTM-NP	SP-PRI	1,265	1,040	82.0	-0.0012	0.4995
MTM-P	SP-PRI	363	299	82.0	.	.
Sub-Total	SP-PRI	1,628	1,339	82.0	.	.
MTM-NP	SP-INT	639	495	77.0	-0.021	0.4916
MTM-P	SP-INT	191	153	80.0	.	.
Sub-Total	SP-INT	830	648	78.0	.	.
MTM-NP	All Periods	1,904	1,535	81.0	-0.0076	0.497
MTM-P	All Periods	554	554	82.0	.	.
Total	All Periods	2,458	1,987	81.0	.	.

Table 47. Summary statistics for number of persons with two or more chronic conditions (MCC) as tracked by the John's Hopkins ACG System applying STICT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study	Study Period	No. Recipients	Number of Persons with MCC	Percent of Persons with MCC	Binomial Test of Proportion MTM-P vs. MTM-NP	
					z	Pr < Z
MTM-NP	SP-PRI	413	338	82	-0.0031	0.4988
MTM-P	SP-PRI	152	125	82	.	.
Sub-Total	SP-PRI	565	463	83	.	.
MTM-NP	SP-INT	307	253	82	-0.0081	0.4968
MTM-P	SP-INT	133	111	83	.	.
Sub-Total	SP-INT	440	364	83	.	.
MTM-NP	All Periods	720	591	82	-0.0056	0.4978
MTM-P	All Periods	285	236	82	.	.
Total	All Periods	1005	827	82	.	.

Table 48. Summary statistics for the mean number of chronic conditions per recipient tracked by the John's Hopkins ACG System applying LENIENT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study	Study Period	No. Recipients	Mean Number of Chronic Conditions	Minimum	Maximum	Mean 95% LCL	Mean 95% UCL	Binomial Test of Proportion MTM-P vs. MTM-NP	
								z	Pr < Z
MTM-NP	SP-PRI	1,265	4.26	0	17	4.10	4.42	-0.0853	0.466
MTM-P	SP-PRI	363	4.52	0	17	4.19	4.84	.	.
Sub-Total	SP-PRI	1,628	4.32	0	17	4.17	4.46	.	.
MTM-NP	SP-INT	639	4.13	0	17	3.88	4.38	0.0117	0.4953
MTM-P	SP-INT	191	4.10	0	12	3.68	4.52	.	.
Sub-Total	SP-INT	830	4.13	0	17	3.91	4.34	.	.
MTM-NP	All Periods	1,904	4.22	0	17	4.08	4.35	-0.0521	0.4792
MTM-P	All Periods	554	4.37	0	17	4.11	4.63	.	.
Total	All Periods	2,458	4.25	0	17	4.13	4.37	.	.

Table 49. Summary statistics for the mean number of chronic conditions per recipient tracked by the John's Hopkins ACG System applying STRICT inclusion and exclusion criteria for the MTM participant and MTM non-participant (CG1) study groups, Florida MTM program June 1, 2010 - May 31, 2014

Study	Study Period	No. Recipients	Mean Number of Chronic Conditions	Minimum	Maximum	Mean 95% LCL	Mean95% UCL	Binomial Test of Proportion MTM-P vs. MTM-NP	
								z	Pr < Z
MTM-NP	SP-PRI	413	4.47	0	16	3.99	4.96	-0.0478	0.4809
MTM-P	SP-PRI	152	4.33	0	16	4.04	4.63	.	.
Sub-Total	SP-PRI	565	4.37	0	16	4.12	4.62	.	.
MTM-NP	SP-INT	307	4.51	0	17	4.15	4.88	-0.0949	0.4622
MTM-P	SP-INT	133	4.80	0	17	4.20	5.41	.	.
Sub-Total	SP-INT	440	4.60	0	17	4.29	4.91	.	.
MTM-NP	All Periods	720	4.41	0	17	4.18	4.64	-0.0726	0.4711
MTM-P	All Periods	285	4.63	0	17	4.25	5.01	.	.
Total	All Periods	1005	4.47	0	17	4.28	4.67	.	.

REGRESSION MODELS EQ5

Table 50. Robust logistic regression base and difference in difference model estimates and p-values for a model of Mortality for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	1.24	0.96	1.67	0.1964	3.47	1.14	0.96	1.41	0.2345	3.13
MTM-P	0.80	0.43	3.48	0.0621	2.22	12.43	235.50	0.00	0.9579	250,779.97
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	0.39	0.29	1.77	0.183	1.48	0.39	0.29	1.74	0.1874	1.47
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	-0.47	0.37	1.66	0.198	0.62	-0.47	0.37	1.61	0.2039	0.63
Hispanic	0.01	0.38	0.00	0.9723	1.01	0.00	0.38	0.00	0.9919	1.00
Other	1.16	0.62	3.45	0.0631	3.19	1.16	0.62	3.43	0.064	3.18
White or European American	.	.	.	.	.	.	.	.	.	.
Age	-0.02	0.02	2.03	0.1541	0.98	-0.02	0.02	2.10	0.1469	0.98
Intervention	-1.89	0.31	36.22	<.0001	0.15	-1.69	0.33	27.16	<.0001	0.18
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	-0.75	0.11	48.76	<.0001	0.47	-0.75	0.11	48.60	<.0001	0.47
MTM-P by Intervention	.	.	.	.	.	-12.02	235.50	0.00	**0.9593**	0.00
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Pre-Intervention	.	.	.	.	.	.	.	.	.	.

Table 51. Robust logistic regression base and difference in difference model estimates and p-values for a model MCC for LENIENT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-9.14	0.72	161.70	<.0001	0.00	-9.13	0.72	160.63	<.0001	0.00
MTM-P	-0.04	0.16	0.06	0.8073	0.96	-0.07	0.20	0.13	0.7224	0.93
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	-0.17	0.13	1.65	0.1992	0.84	-0.17	0.13	1.67	0.1968	0.84
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.40	0.17	5.73	0.0167	1.49	0.40	0.17	5.72	0.0168	1.49
Hispanic	0.43	0.19	5.48	0.0193	1.54	0.44	0.19	5.49	0.0191	1.55
Other	0.52	0.21	6.30	0.0121	1.68	0.52	0.21	6.31	0.012	1.68
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.05	0.01	70.37	<.0001	1.05	0.05	0.01	70.09	<.0001	1.05
Intervention	-0.11	0.14	0.61	0.4359	0.90	-0.13	0.15	0.66	0.4155	0.88
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
Died	0.07	0.63	0.01	0.9119	1.07	0.07	0.63	0.01	0.9133	1.07
Alive	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	4.68	0.29	254.41	<.0001	107.73	4.68	0.29	254.36	<.0001	107.72
MTM-P by Intervention	.	.	.	.	.	0.09	0.32	0.07	0.789	1.09
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.

Table 52. Robust logistic regression base and difference in difference model estimates and p-values for a model of MCC for STRICT MTM participant and MTM non-participant population groups, Florida MTM program June 1, 2010 - May 31, 2014

Parameter	Base Model					Difference-in-Difference (Interaction) Model				
	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR	EST	SE	Wald Chi-Square	Pr > Chi-Sq	OR
Intercept	-10.67	0.65	268.39	<.0001	0.00	-10.96	0.67	266.32	<.0001	0.00
MTM-P	0.03	0.25	0.01	0.9035	1.03	0.19	0.32	0.33	0.5637	1.21
MTM-NP	.	.	.	.	.	.	.	.	.	.
Female	-0.22	0.22	0.95	0.3297	0.80	0.22	0.22	0.92	0.3376	1.24
Male	.	.	.	.	.	.	.	.	.	.
Black or African American	0.39	0.28	2.01	0.1567	1.48	0.40	0.28	2.05	0.1519	1.49
Hispanic	-0.01	0.32	0.00	0.9812	0.99	-0.01	0.32	0.00	0.9727	0.99
Other	0.22	0.36	0.37	0.5425	1.24	0.22	0.36	0.36	0.5492	1.24
White or European American	.	.	.	.	.	.	.	.	.	.
Age	0.07	0.01	44.06	<.0001	1.08	0.07	0.01	44.34	<.0001	1.08
Intervention	0.31	0.22	1.97	0.1601	1.37	0.42	0.26	2.55	0.1102	1.52
Pre-Intervention	.	.	.	.	.	.	.	.	.	.
ACG Risk Weight	5.40	0.51	110.87	<.0001	222.26	5.43	0.52	110.89	<.0001	227.30
MTM-P by Intervention	.	.	.	.	.	-0.38	0.49	0.60	**0.4391**	0.68
MTM-P by Pre-Intervention	.	.	.	.	.	.	.	.	.	.
MTM-NP by Intervention	.	.	.	.	.	.	.	.	.	.

Tables for Evaluation Question 6: What are the differences in the pre-intervention and intervention periods within the intervention group for MTM process measures?

MTM-P Process Measures

Table 53. Table Comparison of total interventions recorded by the UF COP pharmacy staff for all Cohort 1, 2, and 3 participants, Florida MTM program evaluation June 1, 2011 to May 31, 2014

List of All Possible Interventions from the UF COP	Intervention in Cohort 1	Intervention in Cohort 2	Intervention in Cohort 3
30-60 day CMR Follow-Up, Unable to Reach	0	1	0
Contraindication (Drug - Disease) RESOLVED	0	1	0
Contraindication (Drug - Drug) RESOLVED	0	1	0
Counseled on Use of Multiple Pharmacies	1	0	0
Counseled on Utilization of Multiple Primary Physicians	1	0	0
Disconnected Phone Number	0	1	0
Generic Alternative Recommendation ACCEPTED	0	1	0
Lack of Efficacy RESOLVED	0	1	1
Lack of Therapy (Indication) RESOLVED	0	1	0
OTC Therapy Recommendation ACCEPTED	0	1	0
Patient Interaction (Non-MTM Service Inquiry)	0	1	0
Patient Interaction (Non-MTM Service Request/Inquiry)	1	0	0
Patient Medication List Faxed to Prescriber	1	0	0
Patient No Longer Active with Medicaid	0	1	0
Prescriber Interaction/Response	0	1	0
Recommended Preferred Drug List Alternative ACCEPTED	0	1	1
Unnecessary Therapy (Lack of Indication) RESOLVED	0	1	0
Wrong Phone Number	0	1	0
30 to 60-day CMR Check-Up	1	1	0
Adverse Drug Event Identified	1	1	1
Adverse Drug Event RESOLVED	1	1	1
Alternative Dosage Form ACCEPTED	1	1	0
Alternative Dosage Form Recommended	1	1	0
CMR Completed	1	1	1

List of All Possible Interventions from the UF COP	Intervention in Cohort 1	Intervention in Cohort 2	Intervention in Cohort 3
CMR Scheduled	1	1	1
CMR- NOTHING CLINICALLY SIGNIFICANT TO ADDRESS	1	1	0
Combination Therapy Recommendation ACCEPTED (decreased pill burden)	1	1	1
Combination Therapy Recommended (decreased pill burden)	1	1	1
Contacted Ancillary Healthcare Resource	1	1	0
Contacted Prescriber by Fax	1	1	0
Contacted Prescriber by Mail	1	1	0
Contacted Prescriber by Phone	1	1	0
Contraindication Identified (Drug - Disease)	1	1	0
Contraindication Identified (Drug - Drug)	1	1	0
Counseled on Diet/Exercise	1	1	1
Counseled on Lifestyle Modifications	1	1	1
Counseled on Medication (general, side effects, indication, etc.)	1	1	1
Counseled on Medication Adherence/Compliance	1	1	1
Counseled on Medication Administration/Technique	1	1	1
Counseled on Preventative Screenings/Vaccinations	1	1	1
Counseled on Smoking Cessation	1	1	1
Counseled on Weight Loss	1	1	1
Crisis Situation Encountered	1	1	0
Dietary Change/Exercise Recommendations IMPLEMENTED	1	1	0
Drug-Age Interaction Identified (Beers List)	1	1	1
Drug-Age Interaction RESOLVED	1	1	1
Drug-Allergy Interaction IDENTIFIED	1	1	1
Drug-Allergy Interaction RESOLVED	1	1	
Drug-Disease Interaction Identified	1	1	1
Drug-Disease Interaction RESOLVED	1	1	1
Drug-Food Interaction Identified	1	1	1
Drug-Food Interaction RESOLVED	1	1	1
Drug-Pregnancy Interaction Identified	1	1	0
Drug-Pregnancy Interaction RESOLVED	1	1	0
Duplicate Therapy Identified	1	1	1

List of All Possible Interventions from the UF COP	Intervention in Cohort 1	Intervention in Cohort 2	Intervention in Cohort 3
Duplicate Therapy RESOLVED	1	1	1
Educated on Asthma/COPD	1	1	1
Educated on Coverage Gap	1	1	0
Educated on Diabetes	1	1	1
Educated on Disease State (other)	1	1	1
Educated on Dyslipidemia	1	1	1
Educated on GERD	1	1	1
Educated on Heart Failure	1	1	1
Educated on Hypertension	1	1	1
Excessive Dosage Identified	1	1	1
Excessive Dosage RESOLVED	1	1	0
Excessive Duration of Therapy Identified	1	1	0
Excessive Duration of Therapy RESOLVED	1	1	0
Excessive Pill Burden Identified (multiple tablets of lower strength)	1	1	1
Explained MTM Program to Patient	1	1	1
Gap in Therapy - Diabetic without a Statin	1	1	1
Gap in Therapy - Diabetic without an ACE-I or ARB	1	1	1
Gap in Therapy - Heart Failure without a Beta-Blocker	1	1	0
Gap in Therapy - Heart Failure without an ACE-I or ARB	1	1	0
Gap in Therapy - Lack of Controller Medication/Beta-Agonist Overuse Asthma	1	1	1
Gap in Therapy - Lack of Rescue Medication in Asthma	1	1	0
Gap in Therapy - Long-Term Steroid without Antiresorptive Agent	1	1	1
Gap in Therapy – Potentially Inappropriate Beta-Blocker Selection in Heart Failure	1	1	0
Gap in Therapy RESOLVED - Diabetic without a Statin	1	1	1
Gap in Therapy RESOLVED - Diabetic without an ACE-I or ARB	1	1	1
Gap in Therapy RESOLVED - Heart Failure without a Beta-Blocker	1	1	0
Gap in Therapy RESOLVED - Heart Failure without an ACE-I or ARB	1	1	0
Gap in Therapy RESOLVED - Lack of Controller Medication/Beta-Agonist Overuse in Asthma	1	1	1
Gap in Therapy RESOLVED - Lack of Rescue Medication in Asthma	1	1	0
Gap in Therapy RESOLVED - Long-Term Steroid without Antiresorptive Agent	1	1	1
Gap in Therapy RESOLVED - Potentially Inappropriate Beta-Blocker Selection in Heart Failure	1	1	0

List of All Possible Interventions from the UF COP	Intervention in Cohort 1	Intervention in Cohort 2	Intervention in Cohort 3
Generic Alternative Recommended	1	1	0
Insufficient Dosage Identified	1	1	1
Insufficient Dosage RESOLVED	1	1	1
Insufficient Duration of Therapy Identified	1	1	1
Insufficient Duration of Therapy RESOLVED	1	1	1
Lack of Efficacy Identified	1	1	1
Lack of Therapy (Indication) Identified	1	1	0
Level 1 Clinically Significant Drug-Drug Interaction Identified	1	1	0
Level 1 Clinically Significant Drug-Drug Interaction RESOLVED	1	1	0
Level 2 Clinically Significant Drug-Drug Interaction Identified	1	1	1
Level 2 Clinically Significant Drug-Drug Interaction RESOLVED	1	1	0
Level 3 Clinically Significant Drug-Drug Interaction Identified	1	1	1
Level 3 Clinically Significant Drug-Drug Interaction RESOLVED	1	1	0
Level 4 Clinically Significant Drug-Drug Interaction Identified	1	1	0
Level 4 Clinically Significant Drug-Drug Interaction RESOLVED	1	1	0
Lifestyle Modifications ACCEPTED/IMPLEMENTED	1	1	0
Medication Action Plan (MAP) Mailed to Patient	1	1	0
Medication Action Plan (MAP) Refused by Patient	1	1	0
Medication Adherence/Compliance IMPROVED	1	1	0
Medication Administration/Technique IMPROVED	1	1	0
Multiple Pharmacies IMPROVED/RESOLVED	1	1	0
Multiple Pharmacies Identified	1	1	0
Multiple Prescribers IMPROVED/RESOLVED	1	1	0
Multiple Prescribers Identified	1	1	0
Needs Preventative Screening/Immunizations	1	1	0
OTC Therapy Recommended	1	1	0
Patient Deceased	1	1	0
Patient Refused Consultation (during CMR scheduling or CMR call)	1	1	1
Pill Burden REDUCED	1	1	0
Polypharmacy IMPROVED/RESOLVED	1	1	0
Polypharmacy Identified	1	1	0

List of All Possible Interventions from the UF COP	Intervention in Cohort 1	Intervention in Cohort 2	Intervention in Cohort 3
Preventative Screening/Immunizations ACQUIRED	1	1	0
QFUR - NOTHING CLINICALLY SIGNIFICANT TO ADDRESS	1	1	1
QFUR 3-month - Quarterly Follow-up WITHOUT Encounter	1	1	1
QFUR 3-month - Quarterly Follow-up with Encounter	1	1	1
QFUR 6-month - Quarterly Follow-up WITHOUT Encounter	1	1	1
QFUR 6-month - Quarterly Follow-up with Encounter	1	1	1
QFUR 9-month - Quarterly Follow-up WITHOUT Encounter	1	1	1
QFUR 9-month - Quarterly Follow-up with Encounter	1	1	1
Questionable Narcotic Use Identified	1	1	0
Questionable Narcotic Use RESOLVED	1	1	0
Recommended Preferred Drug List Alternative	1	1	1
Renal Dosing Recommendation ACCEPTED	1	1	0
Renal Dosing Recommended	1	1	0
Smoking Cessation ACHIEVED	1	1	0
Unable to Reach (appointment scheduling) - 1st Attempt	1	1	1
Unable to Reach (appointment scheduling) - 2nd Attempt	1	1	1
Unable to Reach (appointment scheduling) - 3rd Attempt	1	1	1
Unable to Reach (CMR)	1	1	1
Unable to Reach Prescriber	1	1	0
Undeliverable Address Recognized (NCOA)	1	1	0
Unnecessary Therapy (lack of indication) Identified	1	1	0
Utilized Caregiver	1	1	0
Utilized Translator	1	1	0
Weight Loss ACHIEVED	1	1	0
Total Possible Interventions by Cohort	127	137	63

Table 54. Comparison of identified and resolved medication therapy problems for 20 selected MTM interventions in the MTM evaluation study group for Cohort 1, 2, and 3 participants, Florida MTM program evaluation June 1, 2011 to May 31, 2014

Drug Related Problems Identified	Cohort 1 (Nominal n=147)			Cohort 2 (Nominal n=171)			Cohort 3 (Nominal n=137)		
	Identified	Resolved	Pct. Resolved	Identified	Resolved	Pct. Resolved	Identified	Resolved	Pct. Resolved
Drug-Age Interaction Identified (Beers List)	0	0	.	0	0	-	1	1	100.0
Drug-Disease Interaction Identified	8	6	75.0	1	1	100.0	0	0	.
Drug-Pregnancy Interaction Identified	0	0	.	0	0	.	.	.	.
Level 1 Clinically Significant Drug-Drug Interaction Identified	8	4	50.0	6	2	33.3	0	0	.
Level 2 Clinically Significant Drug-Drug Interaction Identified	15	7	46.7	24	7	29.2	1	0	0.00
Level 3 Clinically Significant Drug-Drug Interaction Identified	0	0	.	1	1	100.0	2	0	0.0
Level 4 Clinically Significant Drug-Drug Interaction Identified	0	0	.	0	0	.	.	.	.
Combination Therapy Recommended (decreased pill burden)	13	3	23.1	7	1	14.3	2	0	0.0
Duplicate Therapy Identified	4	2	50.0	16	8	50.0	1	1	100.0
Gap in Therapy - Diabetic without an ACE-I or ARB	4	1	25.0	11	3	27.3	2	0	0.0
Gap in Therapy - Diabetic without a Statin	9	1	11.1	22	5	22.7	4	2	50.0
Gap in Therapy - Heart Failure without a Beta-Blocker	1	0	0.0	1	0	0.0	0	0	.
Gap in Therapy - Potentially Inappropriate Beta-Blocker Selection in Heart Failure	1	0	0.0	4	1	25.0	0	0	.
Gap in Therapy - Heart Failure without an ACE-I or ARB	2	0	0.0	5	0	0.0	0	0	.
Gap in Therapy - Long-Term Steroid without Antiresorptive Agent	2	0	0.0	9	2	22.2	2	1	50.0
Gap in Therapy - Lack of Rescue Medication in Asthma	0	0	.	4	3	75.0	0	0	.

Drug Related Problems Identified	Cohort 1 (Nominal n=147)			Cohort 2 (Nominal n=171)			Cohort 3 (Nominal n=137)		
	Identified	Resolved	Pct. Resolved	Identified	Resolved	Pct. Resolved	Identified	Resolved	Pct. Resolved
Gap in Therapy - Lack of Controller Medication/Beta-Agonist Overuse in Asthma	3	3	100.0	7	5	71.4	8	1	12.5
Insufficient Dosage Identified	11	13	.	15	6	40.0	2	2	100.0
Insufficient Duration of Therapy Identified	2	2	100.0	16	6	37.5	1	1	100.0
Lack of Therapy (indication) Identified	21	0	0.0	65	19	29.2	1	0	0.0
Total	104	42	40.4	214	70	32.7	54	14	25.9
Mean number of problems identified and resolved per Medicaid recipient in the MTM program	0.7	0.3	.	1.3	0.4	.	0.4	0.1	.

Table 55. Answers to Closed-ended Questions

Question	Yes N(%)	No N(%)	NA[1] (N%)
1. Was the CONTACT NAME [2] *(or use pharmacist)* from the University of Florida who talked to you about your medicines respectful?	57 (98.3)	0 (0)	1 (1.7)
2. Did CONTACT NAME[2] *(or use the pharmacist)* go through your medications and provide helpful information about your medications?	55 (94.8)	2 (3.5)	1 (1.7)
3. Where you happy with the assistance CONTACT NAME[2] *(or use the pharmacist)* provided?	58 (100)	0(0)	0(0)
4. Did you feel that you had a better understanding of your medications after your Medication Therapy call?	53 (91.4)	5 (8.6)	0(0)
5. Did you find the information that CONTACT NAME[2] *(or use the pharmacist)* sent you in the mail helpful?	46 (79.3)	9 (15.5)	3 (5.2)

[1] Not answered.

[2] In order to enhance recognition of the program, whenever possible, interviewers used the name(s) of the pharmacist(s) who had conducted the CMR.

Table 56. Global Evaluation of the MEDs-AD Waiver Project

Question	Very Poor N(%)	Poor N(%)	Fair N(%)	Good N(%)	Very Good N(%)
How would you rate the overall care that you experienced with the medication program?	0(0)	0(0)	0(0)	14 (24.1)	44 (75.9)

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**Appendix C
Data Mining Activities Evaluation
Final Report**

MEDs-AD Waiver Evaluation:
Data Mining Activities Evaluation - Final Report

Prepared for
Florida Medicaid MED 143

Project 2,
Deliverable # 29
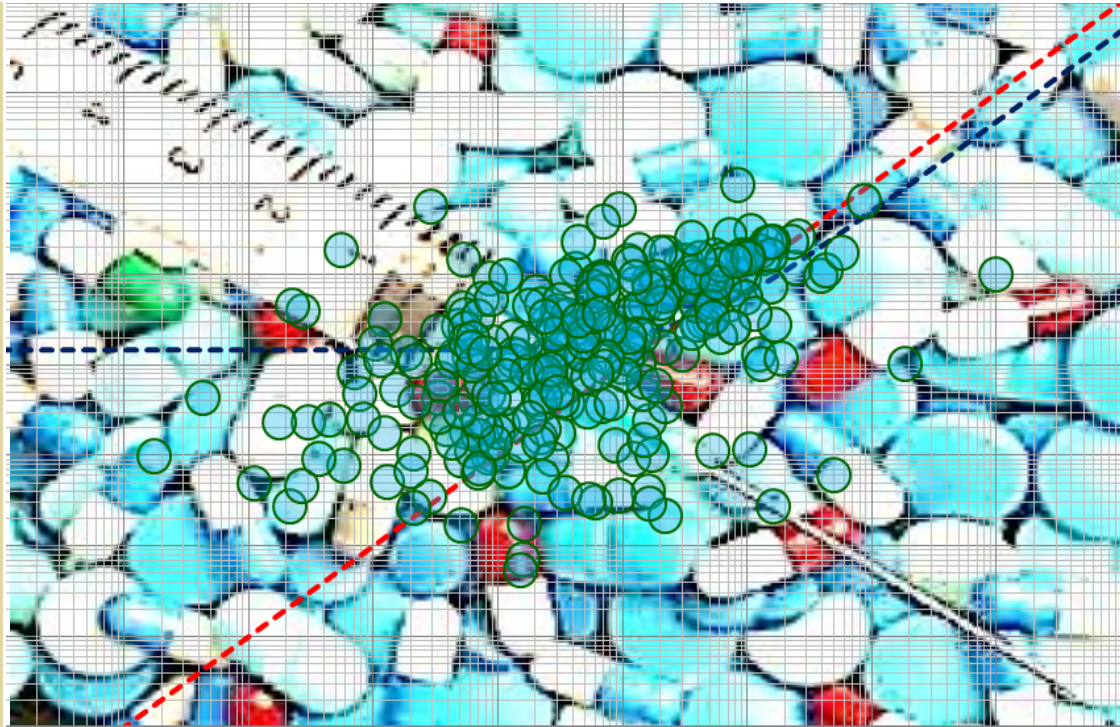
College of Medicine
Florida State University
March 4, 2015

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EXECUTIVE SUMMARY

This is a further evaluation of Florida's Section 1115 Medicaid Medications for Aged and Disabled Research and Demonstration Waiver (MEDs-AD Waiver): Data Mining Activities approved by the Centers for Medicare and Medicaid Services on July 15, 2010. With respect to the evaluation, the principal research question is:

> **Did the Data Mining Initiative (DMI) at the Medicaid Fraud Control Unit (MFCU) of the Florida Office of the Attorney General (FL OAG) add significantly to the results of Medicaid fraud investigations in the State of Florida?**

Data mining refers to the practice of electronically sorting Medicaid Management Information Systems claims through sophisticated statistical models and intelligent technologies to uncover patterns and relationships contained within the Medicaid claims and history files. Data mining has the goal of identifying abnormal utilization and billing practices that are potentially fraudulent.

Parameters for the analyses conducted recognize that the DMI cannot be seen separate or isolated from all the activities conducted within the MFCU at the FL OAG to detect fraud perpetrated against the Medicaid program. Additionally, the timeframe for the analyses, October 2010 through September 2014, (i.e., Federal Fiscal Years (FFY) 2010-11 through FFY 2013-14), is rather short given the lengthy legal and administrative actions required to develop fraud recovery cases. Because of this relative short timeframe, only a limited set of data proved useful for further analyses to properly represent the position of the data mining activities within the MFCU.

On average, the number of cases investigated and the amount of monies recovered by the MFCU, for the period of evaluation FFY 2010-11 through FFY 2013-14, was 910 cases investigated with $124.7 million recovered. This was lower than the average of the period before the MEDs-AD Waiver, FFY 2007-08 through FFY 2009-10, with 918 investigated cases and $139.7 million recovered. For FFY 2013-14, the number of cases was 962 with total recoveries amounting to $92.2 million, including one DMI assigned criminal case which ended in a plea agreement, resulting in a $329,665.17 recovery. However, most cases identified through data mining activities are still pending adjudication.

As a result of the analyses, this evaluation will show that:

- Data mining activity significantly added to the quantity of opened new cases.
- Data mining activities (FFY 2010-11 thru FFY 2013-14) have led to the MFCU opening 102 complaints. Forty-seven complaints have been closed, five have an ongoing active status and 50 complaints were converted to full case investigations by the MFCU. Of the 50 case investigations opened, 30 have been closed and 20 cases have an ongoing active status. Four individuals have been arrested as a result of the DMI and one case ended in a plea agreement resulting in a $329,665.17 recovery. There have been a total of 20 MFCU complaints or cases referred to the Florida Agency for Health Care Administration Bureau of Medicaid Program Integrity (AHCA MPI) for any action they deem necessary.
- A substantive finding regarding the investment in data mining is that, on average per FFY for the period of evaluation, approximately $144,000 is budgeted and approximately $48,500 (or 33.7%) is actually spent on Medicaid fraud data mining within the MFCU.
- Communications between the two organizations, MFCU and AHCA MPI, have greatly improved according to stakeholders in both organizations.
- Data miners are becoming a more integral component of the MFCU team.
- AHCA Software is being upgraded to a better performing case management system.
- AHCA is contracting with a SAS Data Provider to make an assessment of potential fraud and abuse leads.

- Both agencies acknowledge that the data mining activities are increasingly important to the Florida Legislature. The DMI has the potential to better inform the legislature with information that may lead to future changes in legislation.

List of Acronyms

AHCA = Florida Agency for Health Care Administration

CCEB = Complex Civil Enforcement Bureau

CFR = Code of Federal Regulations

CMS = Centers for Medicare and Medicaid Services

DD = Developmentally Disabled

DMAR = Data Mining Analyst Report

DMG = Data Mining Grant

DMI = Data Mining Initiative

DOH = Florida Department of Health

DSS = Decision Support System

FDLE = Florida Department of Law Enforcement

FFP = Federal Financial Participation

FFY = Federal Fiscal Year

FL AG = Florida Attorney General

FL OAG = Florida's Office of the Attorney General

FL GR = Florida General Revenue/Program Income

FLEAT = Florida Law Enforcement Analyst Training

FTE = Full Time Equivalent

HHS = U. S. Department of Health and Human Services

MEDs-AD = Medicaid Medications for Aged and Disabled

MFCU = Medicaid Fraud Control Unit

MOU = Memorandum of Understanding

MPI = Bureau of Medicaid Program Integrity

OB = Obstetrical

OLS = Ordinary Least Squares

ONFC = Opened New Fraud Cases

PANE = Physical Abuse, Neglect, and Financial Exploitation

PCA = Personal Care Assistance

POV = Power-Operated Vehicle

SCCP = Structure-Conduct-Performance Paradigm

SFY = State Fiscal Year

TAMR = Total Amount of Monies Recovered

YTD = Year-To-Date

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1.   Background and Perspective

Estimated Medicaid expenditures for State Fiscal Year 2013-14 (July 2013 through June 2014) were approximately $21 billion.[1] While the vast majority of those expenditures were for services needed, some of the expenditures were the result of fraudulent or abusive billing.

> **Fraud can be defined as**: A knowing or intentional deception or misrepresentation made by a Medicaid provider with the knowledge that the deception could result in some unauthorized benefit to oneself or some other person.

> **Abuse can be defined as**: Provider practices that are inconsistent with generally accepted business or medical practices and that result in an unnecessary cost to the Medicaid program or in reimbursement for goods or services that are not medically necessary or that fail to meet professionally recognized standards for health care.

In Florida, the investigation of suspected Medicaid fraud is under the auspices of the Florida Attorney General (FL AG) at its Medicaid Fraud Control Unit (MFCU), while cases of suspected abuse of the Medicaid program are handled by the Bureau of Medicaid Program Integrity (MPI),[2] located in the Office of the Inspector General of AHCA. Staffers from AHCA, MFCU, and the Department of Health (DOH), the agency responsible for licensing professionals such as physicians and therapists, meet regularly to discuss major issues, strategies, joint projects, and other matters concerning Medicaid care.

Suspected fraudulent billing practices can be discovered in various ways, one of which is analysis of paid Medicaid claims using AHCA's Decision Support System (DSS), which is a subset of the Medicaid Management Information System Claims Database. Data mining is usually defined as an extension of traditional data analyses and statistical approaches, incorporating analytical techniques drawn from a range of disciplines. Data mining by itself is

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[1] Estimate retrieved from http://edr.state.fl.us/content/conferences/medicaid/medltexp.pdf

[2] Authorized by Section 409.913, Florida Statutes, MPI audits and investigates providers suspected of overbilling or defrauding Florida's Medicaid program, recovers overpayments, issues administrative sanctions and refers cases of suspected fraud for criminal investigation to the FL AG.

only a tool since it does not eliminate the need to know the business being performed, to understand the data and the analytical methods involved, nor does it indicate a value to the results of the data mining activity. Therefore, data mining outcomes or results always need translation into meaningful information. In essence, there are two types or approaches in data mining; approaches in which data is analyzed based on overall patterns or settings and approaches seeking to identify departures from the norm. To locate these overall or specific patterns, instructions or decision rules (also algorithms) are often used. There are many data mining methodologies[3] and each involves an assessment or evaluation of the specific approach used.[4]

As the designated "single-state-agency" responsible for administering the Florida Medicaid program, AHCA's data mining activities are supported by federal funding through the Federal Financial Participation (FFP) program. The FFP, however, was not previously available to support data mining activities by staff at the MFCU. The MFCU and AHCA jointly requested that this prohibition be waived. On July 15, 2010, the MEDs-AD Waiver was approved by the Centers for Medicare and Medicaid Services (CMS).

The MEDs-AD Waiver provides Medicaid coverage for aged or disabled residents of the State of Florida with incomes at or below 88 percent of the federal poverty level and assets at or below $5,000 for an individual or $6,000 for a couple. The MEDs-AD Waiver was amended to include activities related to data mining. In particular, the amendment states:

> The evaluation of the MEDs-AD will be revised to include tracking costs of data mining activities and the related recoveries or measurable cost avoidance directly attributable to analysis performed by MFCU analysts in this demonstration.

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[3] Such as SEMMA for SAS and CRISP-DM for SPSS.
[4] For further reading see e.g. Jackson, J. (2002). Data-mining: A Conceptual Overview, Communications of the Association for Information Systems (Volume 8, 2002) 267-296, or
Chung, H.M., and Gray, P. Current Issues in Data-mining, Journal of Management Information Systems, forthcoming. Retrieved from http://www.csulb.edu/~imats/hmchung/rp1.htm

The state's reporting schedule will continue and also include the status and progress of data mining activities related to this amendment. Tracking costs and recoveries will be submitted by the state annually within 60 days of the end of each waiver year.

On September 13, 2010, AHCA (the "Agency") and the FL AG MFCU entered into a Memorandum of Understanding (MOU) that specifies the roles and responsibilities of the two organizations relative to data mining activities. Included in the MOU are the following provisions:[5]

- Coordinate all data mining activities with the Agency, prior to commencement, to ensure actions are not duplicated.

- Approximately biweekly, but not less than monthly, designated personnel with the parties will meet in-person to discuss data mining projects.

- At or before such meetings, MFCU personnel will present Agency personnel with written proposals for data mining projects by the MFCU to review whether the proposed data mining objectives duplicate Agency data mining projects. Meetings will also provide an opportunity to interpret data output generated by mining projects and to exchange information regarding potential projects that will enhance the productivity and efficiency of MFCU and Agency resources.

- By approximately the next biweekly meeting, or within one month, the Agency will provide the MFCU with written verification whether the MFCU's data mining objectives are duplicative of an existing or recently completed Agency data mining project. The Agency may also suggest a coordinated effort between the parties with respect to proposed data mining objectives.

In October 2010, the MFCU at the FL AG commenced data mining activities.

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[5] MOU Section IV.A.11 and Section VI A.2 and A.3 in particular.

Report Overview

This report presents a comprehensive evaluation of the Florida MEDs-AD Waiver: Data Mining Activities approved on July 15, 2010. The purpose of the evaluation is to determine if activities by FL OAG MFCU through the MEDs-AD Waiver have resulted in the recovery of Medicaid funds that were paid as a result of fraudulent activity on the part of Medicaid providers.

A couple of considerations are noted as parameters to the evaluation. First, the DMI cannot be seen apart or isolated from the activities conducted within the MFCU at the FL OAG (i.e., data mining is not a separate functional unit within the MFCU). Therefore, data mining activities can only be measured in relationship to the office's overall performance (see the MFCU organizational chart in Appendix 1 where the regional offices are depicted on the left hand side of the chart. Data mining specialists are placed within these MFCU regional offices: North – Tallahassee, Central – Orlando, and South – Miami, respectively). In addition, given the MOU, this performance mutually reflects on both the FL OAG and AHCA. Although other state and federal agencies and/or offices may be added, the focus of this evaluation will be at the level of MFCU and on the areas of understanding between the two MOU parties; AHCA and MFCU. In particular, this evaluation concentrates on the MEDs-AD Waiver provision regarding duplication and the opportunity to discuss, interpret, and exchange information regarding potential projects to enhance the productivity and efficiency of both MFCU and AHCA's resources. Second, the evaluation only covers October 2010 through September 2014 (i.e., FFY 2010-11 through FFY 2013-14). Given that it takes time to build legal cases, sometimes long after data mining is completed, results which can be traced to MFCU data mining activities under the MEDs-AD Waiver may not be readily available for the timeframe of the evaluation. Third, MFCU activities related to physical abuse, neglect, and financial exploitation (PANE) of patients residing in long-term care facilities are not included in this evaluation since they do not pertain to the data mining activities.

Concerning the evaluation, data mining is recognized as a tool adding a new dimension to the work structure within the FL OAG's MFCU Office and likewise, an opportunity to add to the inter-agency activities of the FL OAG, AHCA, and possibly other state and federal agencies. This added tool is highly qualitative in nature and its full impact will be recognized in time by the recovery of funds attributed to these sophisticated data analysis techniques.

In order to provide a comprehensive evaluation of the DMI MEDs-AD Waiver program, several quantitative and qualitative evaluation methods were used, each chosen for their appropriate application. These evaluation methods include: comparative analyses, attendance at key management meetings, stakeholder and key informant interviews, literature reviews, as well as case file reviews to gather information and develop insights for this report. In addition, repeated rounds of information requests were submitted and honored by MFCU and AHCA MPI staffs without reservation. Given that any organization or institution is represented by a set of purposeful actions and intentions by a group of individuals, available information is analyzed from a perspective of an Input-Throughput-Output-Outcome model, allowing for some measures of efficiency and effectiveness of agency resource allocation.

With respect to the evaluation of data mining activities, the principal research question is:[6]

Did the DMI at the MFCU of the FL OAG add significantly to the results of Medicaid fraud investigations in the State of Florida?

In principle, this demands a comparison of MFCU outcomes with and without the MEDs-AD Waiver. As illustrated in Figure 1, this means comparing MFCU outcomes including or excluding the colored field named DMI. This brings a hypothetical element to the evaluation, which is to value and compare outputs under different scenarios; time series wise or under

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[6] A stricter definition in terms of significantly adding to recovery of Medicaid funds, which are paid as a result of fraudulent activity on behalf of Medicaid providers, would have been preferable. However, it is known that only one recovery in monetary terms has been reported to date. Therefore, a broader definition in terms of significantly adding to the results of Medicaid fraud investigations is used instead.

decomposition of the MFCU operations allocating or assigning efforts to DMI, while at the same time the DMI is an integral part of MFCU.
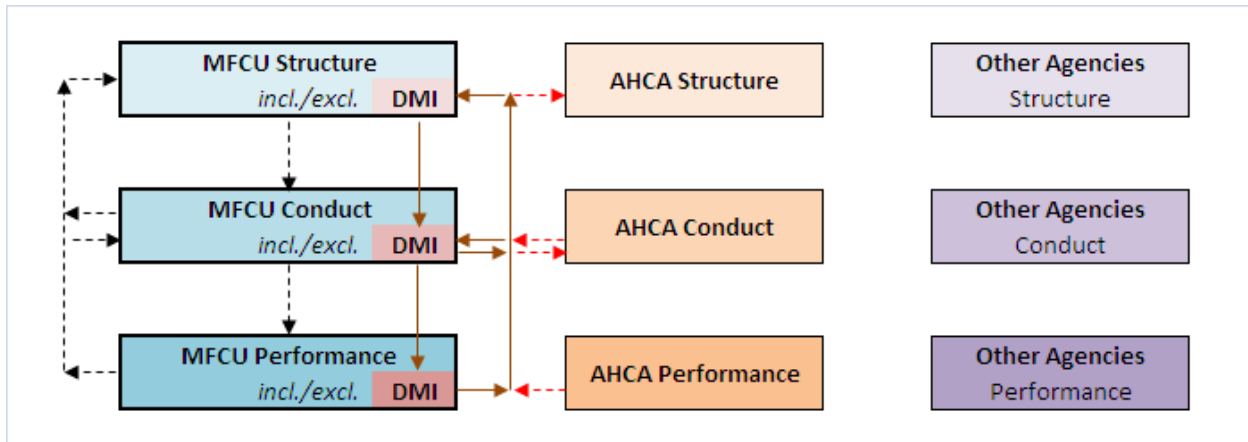

Figure 1: Structure-Conduct-Performance Paradigm (SCPP) transposed on MFCU/DMI, AHCA and Other State and or Federal Agencies

The overall framework depicted in Figure 1 is the Structure-Conduct-Performance Paradigm (SCPP) by Edward S. Mason.[7] According to this framework, an organization's performance depends on the conduct of its employees, which in turn depends on the structure of the organization. Conversely, once performance is determined or known, conduct and/or structure of the organization will, in turn, change.

When adding the DMI based on the MEDs-AD Waiver and MOU, not only does the MFCU structure change, but also its organizational conduct and performance change. In addition, the structural relationship between MFCU and AHCA changes, as well as their respective conduct and performance. The MEDs-AD Waiver, the MOU, and in particular, the biweekly referral meetings and monthly data mining meetings enhance the productivity and efficiency of MFCU and AHCA's fraud and abuse intelligence resources. (Note: the red dashed arrows indicate the AHCA contributions at the various levels, as far as they pertain to the added DMI). Other

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[7] The paradigm was originally developed by Edward S. Mason of Harvard University in the 1930's. Since then, it has been developed by J.S. Bain and other market structuralists in the field of Industrial Organization. It is also used in the study of Economic Systems and in the study of Management and Organization.

agencies are also depicted in Figure 1, given that other agencies are part of the Medicaid network and are consulted by the MFCU. However, links to the other agencies were omitted since these effects fall outside the scope of this evaluation.

Both descriptive and inferential statistical techniques were used to analyze the quantitative data. Descriptive statistics were focused on the analyses of tables and the use of descriptive graphs and figures. Analytic statistics were focused on appropriate multivariate techniques, such as ordinary least squares (OLS) regression. Multivariate analyses will allow for a more nuanced evaluation that can control for the introduction of the DMI. Relevant data from FFY 2007-08 through FFY 2013-14 is used, thus including data on years prior to the date that the MEDs-AD Waiver was granted and data mining activities commenced. Given the limited timeframe and the use of annual data, care was required when describing the evaluation results.

In section 2, some descriptive statistics are presented relevant to the fraud investigation activities of the MFCU, including statistics on recent data mining activities. Section 3 covers significant case and referral highlights in the format of a series of descriptions on DMAR cases during FFY 2013-14. Interviews conducted with key informants on the DMI and data mining activities are the focus of section 4. These in-person interviews were held to capture the more qualitative aspects of the DMI. Focus of the interviews were: potential issues with data miner turnover, the developing position of the DMI within the MFCU, the communication and institutionalization of the inter-agency cooperation, and the evolving impact of data mining detection to prevent Medicaid fraud and abuse. Section 5 covers the evaluation findings. An analytic inquiry is presented in Appendix 2.

2. Data Mining Activities Statistics

This section focuses on descriptive statistics based on data requests submitted to the FL OAG. It covers general statistics on the Medicaid Fraud Control Unit (MFCU) as well as specific statistics relating to the data mining activities within the MFCU. The purpose of presenting statistics on both levels was to view the data mining activities in their proper relative context to the MFCU (as per Figure 1) as well as to present possible variables for the DMI analyses and evaluation in section 5 (and Appendix 2). This section covers input variables (section 2.1), output variables (section 2.2), and outcome variables (section 2.3). Section 3 also provides output variables; short summaries on significant cases and case referral highlights. Section 4 covers the data mining process in further detail, based on interviews with key informants and data mining analysts.

Figure 2 assists with obtaining a better understanding of the numerous variable categories in their proper setting. Given the variables, comparing input and output provides a measure of efficiency, while comparing input with outcome provides a measure of effectiveness. The presentation of data is by FFY, October 1st through September 30th.
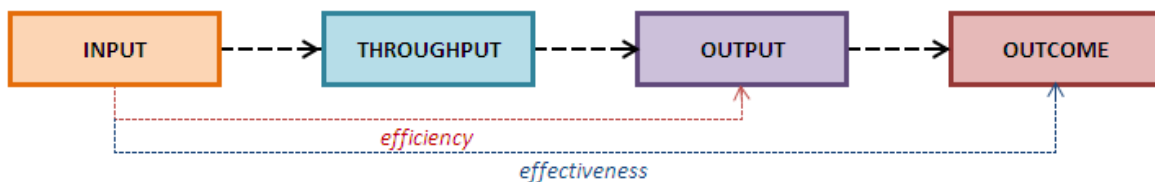

Figure 2: Input – Throughput – Output – Outcome Model

2.1 Input: Budget, FTEs, and Training

According to the requirements of federal statutes and regulations concerning FFP, 75 percent of funding for the MFCU is provided by means of federal grants and 25 percent is matching funds from the State of Florida's General Revenue Fund and Program Income (FL GR) account. Figure 3 depicts the annual MFCU budgets, including the FFP grants and the state matching funds, for FFY 2007-08 through FFY 2013-14. In addition, the MFCU funds provided through the FFP Data Mining Grant (DMG) with matching state funds were included, but noted separately for FFYs 2010-11 through FFY 2013-14.
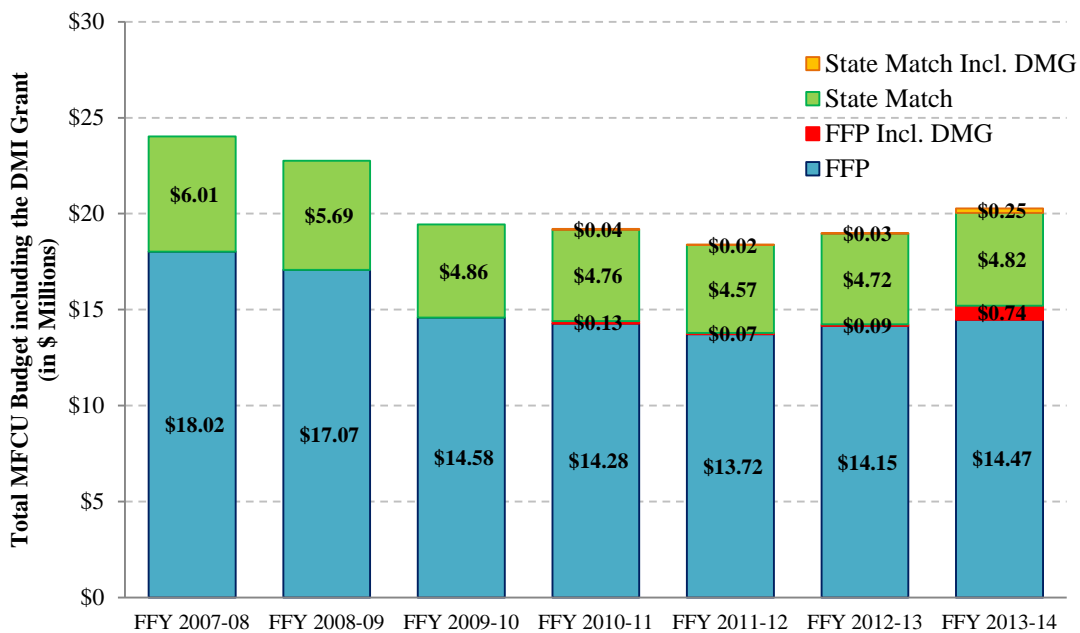
Figure 3: MFCU Budget, MFCU Grant, and Data Mining Grant (FFP and Florida State Matching Funds), FFY 2007-08 through FFY 2013-14

As can be derived from Figure 3 data, the overall average annual MFCU budget over the years depicted is $20.6 million, with $15.4 million coming from the MFCU Grant and $5.2 million from Florida state matching funds. The total MFCU budget, over the recent two FFYs seems to relatively improve after the budget low in FFY 2011-12. The average for the period FFY 2007-

08 through FFY 2009-10 is approximately $22.0 million, while the average during the MEDs-AD Waiver evaluation period from FFY 2010-11 through FFY 2013-14 is $19.2 million.

The added DMGs (both FFP funds and Florida state matching funds) since FFY 2010-11 were quite insignificant with regard to the annual budgets (adding less than one percent to the overall MFCU budget). However, the DMG in FFY 2013-14 indicates a significant increase, almost one million dollars, while constituting approximately 4.9 percent of the total budget, as illustrated in Figure 3a. The data mining budgets during the initial MEDs-AD Waiver period are depicted in Figure 3a; including both the FFP grant and Florida state matching funds for FFY 2010-11 through FFY 2013-14.
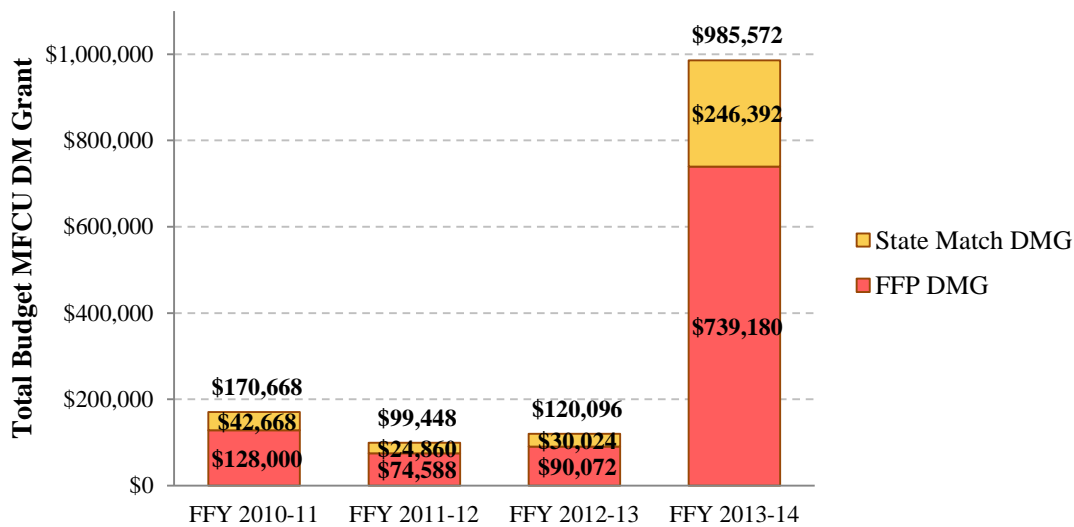
Figure 3a: MFCU DMI Budget (Federal DMG and Florida State Matching Funds), FFY 2010-11 through FFY 2013-14

The lion's share, or 52.4 percent, of the FFY 2010-11 data mining budget was allocated to "equipment." For the fiscal year budgets FFY 2011-12 and FFY 2012-13, on average, 48.1 percent was allocated in the respective budgets to "salaries and benefits." For FFY 2013-14, $985,572 was approved by HHS. The increase was due to $800,000 of potential contractual services for data mining enhancements, which falls outside the scope of this evaluation.

Therefore, the operational budget for FFY 2013-14 should be considered at the level of $185,572, which is 54.5 percent higher than previous FFYs budget. Next, and in line with previous FFYs, the budget consisted of staff "salaries and benefits" (62.8%), "equipment/other" (30.6%), and "indirect costs" (6.6%). (Percentages are based on the operational budget).

Although budgets are used as a means of measuring input, it is the actual expenditures of funds that are most relevant as a direct input measurement. Figure 4 depicts the differences between the budgets and expenditures for MFCU and Figure 4a depicts the same for the DMI. For comparative purposes, the expenditures are shown with the budgets from Figures 3 and 3a as a backdrop. Both Figures 4 and 4a show that actual expenditures are significantly less than their respective budgets.
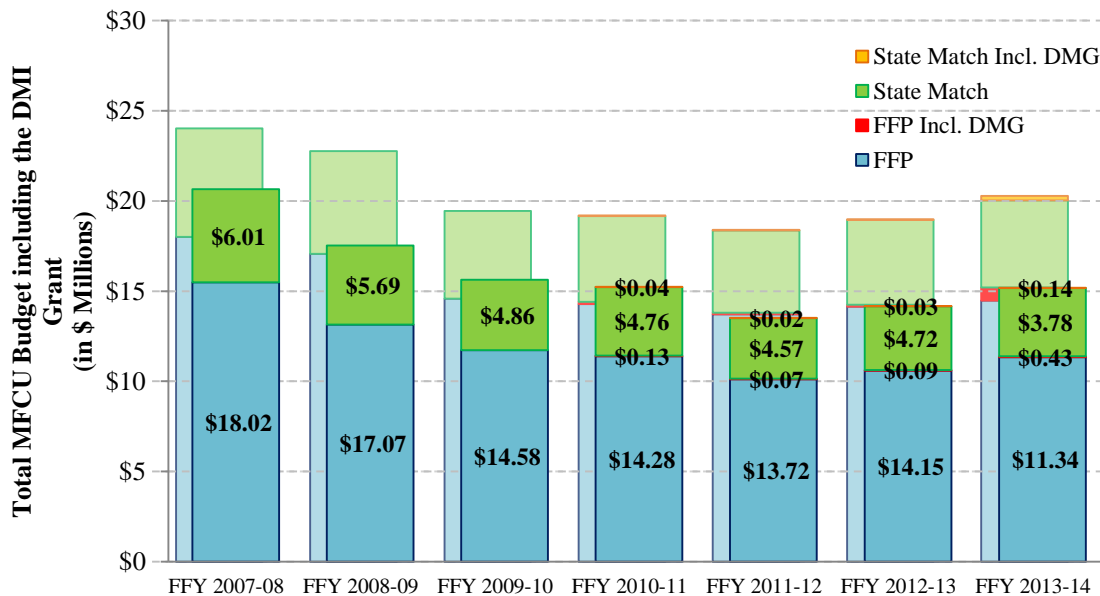
Figure 4: MFCU Budget and Expenditures, MFCU Grant and DMG (FFP and Florida State Matching Funds), FFY 2007-08 through FFY 2013-14

Total expenditures by MFCU, on average, were approximately 78.4 percent of the respective fiscal year budgets, with a low of 73.5 percent for FFY 2011-12. For FFY 2013-14, the

expenditures comprised approximately 74.9% of the MFCU budget. The lower level of expenditures as compared to the budget is, in part, due to unfilled or unfunded positions within MFCU.[8]

Figure 4a depicts the DMI allocated budgets and expenditures for the FFYs 2010-11 through FFY 2013-14. Similarly, and for comparative purposes, the expenditures are shown with the budgets from Figure 3a as a backdrop.
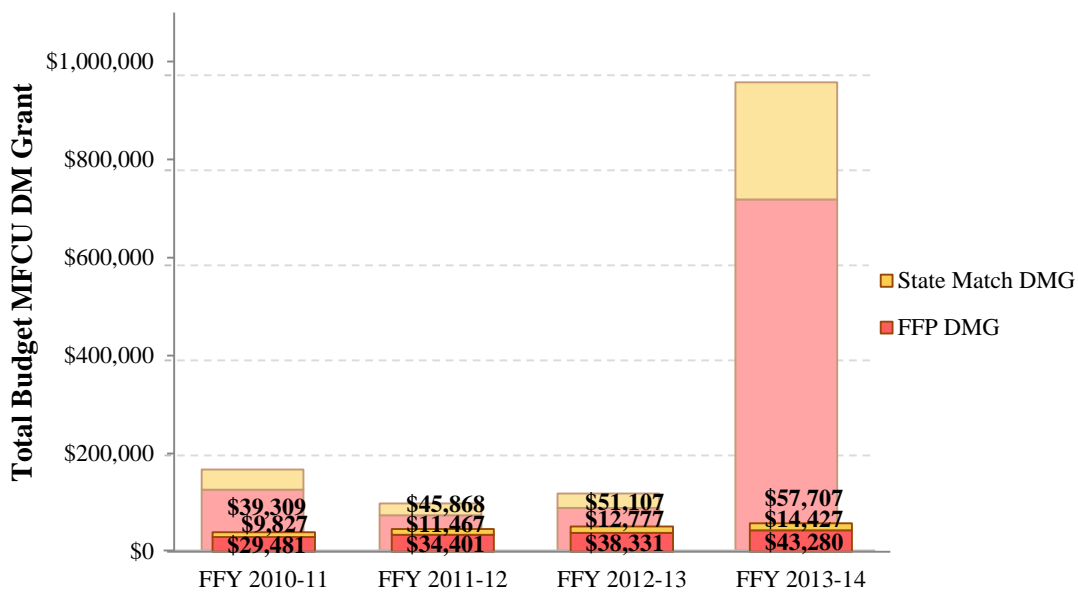
Figure 4a: MFCU DMI Budget and Expenditures (Federal DMG and Florida State Matching Funds), FFY 2010-11 through FFY 2013-14

For the DMI, total expenditures shown in figure 4a for FFY 2010-11 were only $39,309, or approximately 23.0 percent of that fiscal year's total budget. For FFYs 2011-12 and FFY 2012-13, expenditures were 46.1 percent and 42.6 percent, respectively. In FFY 2013-14 however, given the increase in the budget, the relative total expenditures dropped to 5.9 percent of the DMI budget only (or 31.1% excluding the $800,000 contractual services for data mining enhancements). Total expenditures rose at an average rate of 12.6 percent annually over the years depicted.

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[8] The MFCU had some unfilled staff and support positions throughout the last couple of years.

"Data line charges" are the largest cost component of DMI, constituting an average of approximately 49.7 percent, followed by "salaries and benefits" at an average of 44.5 percent. "Software and maintenance" and "indirect costs" cover the remainder. For FFY 2013-14, the lion's share of expenditures was "salaries and benefits." The specific expenditure data for both MFCU and DMI were used as an input variable for the evaluation in section 5 (and Appendix 2).

Table 1 presents the total FTEs budgeted for the MFCU by employee categories for FFY 2007-08 through FFY 2013-14. Table 1 also shows the breakdown by budgeted employee category, as well as the respective reserve positions. For the applied FTEs, it is noted that there were 26 unfilled positions or vacancies: four vacant positions for attorneys, three for auditors, fifteen for law enforcement, and four others. The figures in red show the actual FTE associated with the DMI, an increase from 0.25 to 0.75 FTE for the three data miners respectively. Table 1a provides a further regional breakdown of data mining analysts by Florida MFCU region. Further details for analyses or conversion towards FTEs were not available.

Table 1: MFCU FTE Employment including Data Mining Analysts, Budgeted versus Applied, FFY 2007-08 through FFY 2013-14

		FFY 2007-08	FFY 2008-09	FFY 2009-10	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14
Total	**Budgeted**	232	232	217	214	210	210	210
	Attorneys	26	26	27	27	27	27	27
	Investigators	131	106	101	100	97	97	115
	Auditors	7	7	7	10	10	10	10
	Support Staff	68	63	52	52	53	53	58
	of which Data Mining Analysts				*0.45*	*0.75*	*0.75*	*2.25*
Reserve	Attorney		1	-	-	-	-	-
Reserve	Investigators	-	24	24	19	19	19	19
Reserve	Support Staff	-	5	6	6	4	4	4
			-30	-30	-25	-23	-23	-23
TOTAL FTEs Applied		**232**	**202**	**187**	**189**	**187**	**187**	**187**

Table 1a: MFCU FTE Data Mining Analysts and Approximate Hours Devoted to Data Mining, per MFCU Region, FFY 2010-11 through FFY 2013-14

DATA MINING GRANT					
		Region / Hours[9] devoted to DMI			
	DMI Analysts FTEs	North Hours (%)	Central Hours (%)	South Hours (%)	Total Hours
FFY 2010-11	**0.45**	313 (15)	313 (15)	313 (15)	940
FFY 2011-12	**0.75**	522 (25)	522 (25)	522 (25)	1,566
FFY 2012-13	**0.75**	522 (25)	522 (25)	522 (25)	1,566
FFY 2013-14	**2.25**	1,566 (75)	1,556 (75)	1,566 (75)	4,698

As shown in Tables 1 and 1a, the FTEs assigned to data mining analyst tasks in the first three FFYs represent only a small fraction of the overall MFCU employment, adding on average, approximately 0.34 percent to the total MFCU employment. In addition, it is noted that two of the three original data mining analysts with the MFCU left the office during FFY 2011-12, while a third was promoted internally during FFY 2012-13, also leaving direct data mining activities. The positions were filled by existing employees who were "brought up to speed" in a relatively

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[9] Hours calculation based on 2,088 standard state hours per FTE.

short timeframe. [10] Consequently, none of the three "original" data mining analysts were operative at the end of the third FFY. In FFY 2013-14 the three DMI analysts were set at 2.25 FTE (0.75 FTE each), with 0.75 FTE for regular grant staffing (not tabulated). For evaluation purposes, it is relevant to exclude the mentioned reserve FTE positions, as well as the vacancies from the input variable. In addition, also for evaluation purposes, adjustments to personnel FTEs were made with respect to loss due to training hours, as described next.

For reference purposes, during FFY 2013-14, all MFCU staff attended a total of 4,410.95 hours of training, which on 187 FTE, equates to an average of 23.6 hours of training per staff member. Similarly, during FFY 2011-12, MFCU staff attended a total of 4,437.25 hours of training, while in FFY 2010-11 a total of 4,798.75 hours of training were attended. Given that there were 187 FTEs assigned to the MFCU in FFY 2011-12 and 189 in FFY 2010-11, this means that on average, 23.6 and 25.3 hours per FTE employee per year were allocated to training. Data mining analysts, on the other hand, attended 653.25 hours, 189 hours, 241.5 hours, and 133.25 hours training during FFY 2010-11 through FFY 2013-14, respectively. Given that it does not make sense to divide the hours of training by data mining tasks (or partial FTEs), division per person delivers an average of 217.75 hours, 63 hours, 80.5 hours, and 44.4 hours, respectively, for the data mining analysts. [11]

The focus of the MFCU data mining analyst training in FFY 2010-11 was primarily on criminal analytics to increase the synergy between data mining activities and the fraud-oriented work context of the MFCU; e.g., some 480 hours (or 73.5% of total training hours) were allocated toward "Florida Law Enforcement Analyst Training (FLEAT)." The main batch of training hours was allocated toward DSS support contractor training (46 hours or 7.0%), followed by an Intelligence Officer Course (40 hours or 6.1%). In addition, seminars and webinars were attended. The main training providers were the Florida Department of Law Enforcement (FDLE)

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[10] Although the positions were filled, some human resource value (e.g. training and experience) was lost in the process.

[11] In taking approximately 1,794 hours per year for a full FTE, as per the Bureau of Labor Statistics, this comes out at 0.1214 FTE, 0.0351 FTE, 0.0449 FTE and 0.0248 FTE per the FFY 2010-11 through FFY 2013-14 respectively. Data on approximate hours retrieved from http://www.bls.gov/opub/mlr/2009/05/art1full.pdf

with 495 hours (or 75.8% of total training hours) and AHCA with 71 hours (or 11.3% of total training hours). Table 2 shows the top seven course titles for training hours allocated in FFY 2011-12, FFY 2012-13, and FFY 2013-14, respectively. As can be seen from the table, the scope of training has become more diverse as compared to the first year of training.

Table 2: Top Seven Course Titles in Time Allocation for Training of MFCU Data Mining Analysts, FFY 2011-12 and FFY 2013-14

FFY 2011-12	hours	percentage
Financial Records Examination and Analysis - FREA	32	16.9%
Criminal Interview and Interrogations	24	12.7%
Tools of the Trade-Building Elder Financial Exploitation Cases	24	12.7%
Elder Abuse Training Program	16	8.5%
Certified Law Enforcement Analyst Training Seminar	16	8.5%
Courtroom Testimony	16	8.5%
Security and Fraud Seminar - 2011	6.5	3.4%
Sub-Total	**134.5**	**71.2%**
Total Training Hours Allocated for All Courses	**189**	**100%**
FFY 2012-13		
Basic Investigations	40	16.6%
Critical Thinking and Analytical Methods (CTAM) Course	40	16.6%
Criminal Justice Information System (CJIS) Annual Training	27	11.2%
Interactions between Medicaid Fraud Control Units and Program	24	9.9%
Cyber Investigation 101 - Secure Techniques for Onsite Previewing	16	6.6%
Cyber-Investigation 105 - Basic Cell Phone Investigations	16	6.6%
CCEB Annual Training 2013	15	6.2%
Sub-Total	**178**	**73.7%**
Total Training Hours Allocated for All Courses	**241.5**	**100%**
FFY 2013-14		
NAMFCU Medicaid Fraud Investigative Training 101	48	36.0%
Cell Phone Investigations Basic	16	12.0%
Critical Thinking Technical Assistance Seminar	16	12.0%
Florida Fusion Center (FFC) Fusion Center Development	12	9.0%
Computer Skills for Law Enforcement Basic	8	6.0%
DAVID Modernization Training	4	3.0%
DSS Encounter Claims	3	2.3%
Sub-Total	**107**	**80.3%**
Total Training Hours Allocated for All Courses	**133.25**	**100%**

2.2   Output: Complaints, Opened New Cases, Cases Investigated, and Disposition of Cases

Measures of output included number of complaints,[12] number of fraud complaints, MFCU opened new fraud cases (ONFC), cases investigated, and cases closed. Complaints served as the basis for investigations by the MFCU. For FFY 2010-11 the MFCU received 1,661 complaints and opened a total of 354 (21.3%) new cases, of which 302 (18.2%) were new fraud cases. During FFY 2011-12, the MFCU received a total of 1,317 complaints, of which 292 (22.2%) were opened as new cases and 227 (17.2%) were new fraud cases. FFY 2012-13 brought in 1,530 complaints and 249 (16.3%) new cases, of which 191 (12.5%) were opened as fraud cases. Total complaints in FFY 2013-14 amounted to 1,735, from which 236 new fraud cases were opened. Data on number of complaints (horizontal axis) versus number of opened new fraud cases (vertical axis) for the four FFYs is depicted in Figure 5.
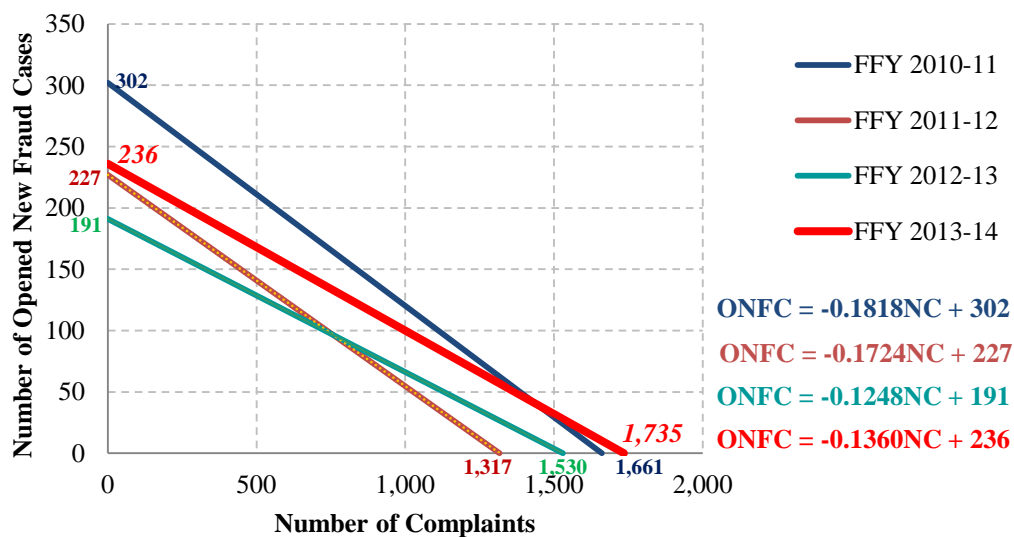

Figure 5: MFCU Opened New Fraud Cases from Complaints, FFY 2010-11 through FFY 2013-14

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[12] A complaint is an allegation that a person or provider may have committed an offense that may constitute a violation of state or Federal law.

From the data and information presented in Figure 5, it can be observed that the year-to-year opened new cases incidence ratio (i.e., opened new fraud cases divided by the number of complaints, or the slope coefficients) declined slightly from 0.182 in FFY 2010-11 (= 302/1,661) to 0.172 in FFY 2011-12 (= 227/1,317), before dropping to 0.125 in FFY 2012-13 (= 191/1,530). In FFY 2013-14, the ratio increased to 0.136 (= 236/1,735). The average annual incidence ratio of opened new cases divided by complaints was 0.154.

Table 3 provides data on the number of fraud complaints received by the MFCU. The average number of fraud complaints over the years depicted was 781. The approximate annual growth rate in fraud complaints received was 5.3 percent.

Table 3: The Number of all Fraud Complaints Received by the MFCU, FFY 2007-08 through FFY 2013-14

Federal Fiscal Year	Number of Fraud Complaints Received
FFY 2007-08	581
FFY 2008-09	510
FFY 2009-10	1,171
FFY 2010-11	842
FFY 2011-12	707
FFY 2012-13	856
FFY 2013-14	799

Table 4 below provides an overview of the number of fraud complaints received by the MFCU, delineated by source, for FFY 2010-11 through FFY 2013-14. Major sources of fraud complaints are depicted in shades of red. As shown in Table 4, the number of complaints received as a result of the MFCU DMI is 27, 16, 16, and 43 (or 3.2%, 2.3%, 1.9%, and 5.4%), respectively, for the four FFYs. Table 4a provides a selection of the same data; i.e., the top eight sources of fraud complaints with the MFCU DMI ranking as the eighth largest source, based on aggregate levels for the four years FFY 2010-11 through FFY 2013-14. Addressing FFY 2013-14 only, the MFCU DMI became the sixth largest source of all fraud complaints.

Table 4: The Number of all Fraud Complaints Received by the MFCU, Delineated by Source, FFY 2010-11 through FFY 2013-14

Source:	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14	Source:	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14
AHCA - District Office	7	1	1	1	FBI - Federal Bureau of Investigations	4		3	3
AHCA - Fraud Prevention & Compliance Unit (FPCU)	2	8	1		FDLE - Florida Dept. of Law Enforcement	2		1	3
AHCA - Health Quality Assurance	13	8	9	2	Government Employee	2	1	2	1
AHCA - Medicaid Program Integrity	61	30	25	25	HHS - Health & Human Services	5	4		
AHCA - Office of Inspector General/General Council	3	3		2	HHS - OIG Health & Human Services Inspector	11	7	9	17
AHCA - Other Units	3	1		1	HMO - Investigative Unit	11	5	2	
AHCA - Third Party Liability/Recovery	1		1		Insurance Company	2	1		2
Anonymous (FFY 2010-11) / Attorney (FFY 2013-14)	13			7	Joint Task Force	4	1	1	2
APD - Agency for Persons with Disabilities	20	10	10	7	Law Enforcement Agency	7	7	3	7
APS - Adult Protective Services	17	5	4	5	Managed Care Contractor/Provider/SIU	7			7
Citizen	301	198	143	104	Medicaid Provider	28	21	44	31
CMS - Center for Medicare & Medicaid Services	2			6	Medicaid Recipient	50	108	225	169
Confidential Informant	6	3			MFCU - Other than Florida	4	3	1	3
Consumer Protection Agency	1		1		MFCU - Statewide Intel Team	2			
Contractor for Center for Medicare & Medicaid	7	8	1		**MFCU Data Mining Initiative**	27	16	16	43
County Health Department		1			NAAG - National Association of Attorney Generals	1	1		
DEA - U.S. Drug Enforcement Agency			1		NAMFCU - National Association of MFCU				
Dept. of Children & Families - IG Office	1			2	Non-Profit Organization			1	
Dept. of Children & Families - Other than APS	1	4			Operation Spot Check		1		
Dept. of Elder Affairs	1				OSWP - Office of Statewide Prosecution		1		
DFS - Dept. of Fin. Services Div. of Insurance Fraud				2	Press Report / Media Report	2	4		2
DOH - Dept. of Health	1	2	1	3	Qui Tam	127	80	119	102
DOH - Medical Quality Assurance	1	2		1	SAO - State Attorney's Office	1			
DOJ - Dept. of Justice	3				Spinoff Case	31		18	21
DPAF - Dept. of Public Assistance Fraud		1			SSA - Social Security Administration	1	20		
Elected Official	2				State Agency - Other	2		2	1
Employee	29	58	63	83	USAO - U.S. Attorney's Office		1		
Family Member	22	82	147	134	Veteran Affairs			1	
					Total Number of Complaints	842	707	856	799

190

Table 4a: The Top Eight Sources by Number of all Fraud Complaints Received by the MFCU, Delineated by Source, FFY 2010-11 through FFY 2013-14

	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14	Total FFY 2010-11 through FFY 2013-14	Average Percentage FFY 2010-11 through FFY 2013-14
Citizen	301	198	143	104	**746**	**23.3%**
Medicaid Recipient	50	108	225	169	**552**	**17.2%**
Qui Tam	127	80	119	102	**428**	**13.4%**
Family Member	22	82	147	134	**385**	**12.0%**
Employee	29	58	63	83	**233**	**7.3%**
AHCA - Medicaid Program Integrity	61	30	25	25	**141**	**4.4%**
Medicaid Provider	28	21	44	31	**124**	**3.9%**
MFCU Data Mining Initiative	**27**	**16**	**16**	**43**	**102**	**3.2%**
Sub-Total	**645**	**593**	**782**	**691**	**2,711**	**84.6%**
All Other	**197**	**114**	**74**	**108**	493	15.4%
Total Number of Fraud Complaints	**842**	**707**	**856**	**799**	**3,204**	**100.0%**

Table 5 displays the top five sources of fraud complaints received by the MFCU, by provider, for FFY 2010-11 through FFY 2013-14. Shading is provided on recurring provider categories. As evidenced by the table, four provider categories represent the majority of fraud complaints.

Table 5: Top Five Provider Types in Number of MFCU Fraud Complaints, FFY 2010-11 through FFY 2013-14

Provider Type	Number of MFCU Fraud Complaints Per Provider Type Top 5	Cumulative Percentage of Total Top 5
FFY 2010-11		
Physician (MD)	153	18%
Home and Community Based Service	111	31%
Pharmaceutical Manufacturer	92	42%
Pharmacy	64	50%
None*	43	55%
Other	**379**	**100%**
TOTAL FFY	**842**	
FFY 2011-12		
Physician (MD)	123	17%
Home and Community Based Service	99	31%
Pharmacy	64	40%
None*	48	47%
Dentist	46	54%
Other	**327**	**100%**
TOTAL FFY	**707**	
FFY 2012-13		
Physician (MD)	162	19%
Dentist	72	27%
Pharmacy	69	35%
General Hospital	65	43%
Home and Community Based Service	58	50%
Other	**430**	**100%**
TOTAL FFY	**856**	
FFY 2013-14		
Physician (MD)	133	17%
Home and Community Based Service	76	26%
Dentist	57	33%
Pharmacy	51	40%
Case Management Agency	43	45%
Other	**439**	**100%**
TOTAL FFY	**799**	

*No Provider Type assigned

Table 5 indicates that the provider type category "Physician (MD)" ranks highest in terms of the number of MFCU fraud complaints received for the four years depicted (18%, 17%, 19%, and 17% of all complaints received, respectively). Both "Home and Community Based Service" (13%, 14%, 7%, and 9%, respectively), and "Pharmacy" (8%, 9%, 8%, and 7%, respectively) appear in the top five of all four years represented. The last column in Table 5 provides cumulative percentages of the top five fraud complaint sources representing 55 percent, 54 percent, 50 percent, and 45 percent, respectively, of the total number of all fraud complaints received during each of the four years represented. The downward number indicates a diversion into other provider types. Table 6 displays the top three sources of fraud complaints by provider type, with the MFCU DMI as the source.

Table 6: Provider Types in Number of Assigned MFCU DMI Fraud Complaints, FFY 2010-11 through FFY 2012-13

Provider Type	Number of MFCU DMI Fraud Complaints Per Provider Type	Cumulative Percentage of Total
FFY 2010-11		
Physician (MD)	21	78%
Physician (DO)	4	93%
Therapist (PT, OT, ST, RT)	2	100%
	27	
FFY 2011-12		
Home and Community Based Service	12	75%
Therapist (PT, OT, ST, RT)	3	94%
Physician (MD)	1	100%
	16	
FFY 2012-13		
Dentist	12	75%
Physician (MD)	3	94%
Therapist (PT, OT, ST, RT)	1	100%
	16	
FFY 2013-14		
Case Management Agency	27	63%
Physician (MD)	9	84%
Dentist	2	88%
Skilled Nursing Facility	2	93%
General Hospital	1	95%
Pharmacy	1	98%
Therapist (PT, OT, ST, RT)	1	100%
	43	

For the MFCU DMI, the largest provider category in number of fraud complaints was "Physician (MD)" with 34 total complaints over the four FFYs. The provider type, "Case Management Agency," had a total of 27 fraud complaints in FFY 2013-14 alone. "Dentist" and "Home and Community Based Service" had 14 and 12 complaints, respectively, over the FFYs.

Of the complaints mentioned, only a subset may be elevated to investigative case status. Table 7 provides information on MFCU cases investigated (caseload) and opened new cases by source (defined per agency/category), for FFY 2007-08 through FFY 2013-14. Shading is provided to highlight the major sources (red).

Table 7: MFCU Cases Investigated and Opened New Fraud Cases by Source, FFY 2007-08 through FFY 2013-14

|	Federal Fiscal Years						
	FFY 2007-08	FFY 2008-09	FFY 2009-10	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14
Caseload*	922	927	906	930	872	877	962
Cases: Opened New During FFY	302	269	313	302	227	191	236
Cases: Sources of New Opened Cases (sources defined by agency):							
AHCA - Medicaid Program Integrity	122	51	43	33	19	12	15
Law Enforcement Federal		3	2	1	2	3	2
Law Enforcement Florida	3	5	5	9	8	3	6
MFCU	2	31	1		2	0	
MFCU Data Mining Initiative				**12**	**14**	**3**	**21**
Other AHCA	4	20	9	12	5	2	
Other Federal Agencies	1	10	10	13	5	3	8
Other State Agencies	36	22	28	23	8	8	9
Private Sector	51	37	88	55	70	37	71
Qui Tam	61	64	99	135	84	117	100
Spin-off Cases	22	26	28	9	10	3	4

*Caseload is a snapshot of the number of cases on the last day of the FFY.

As per Table 7, the annual average number of cases investigated is 913 cases per year for the seven year period shown, and 910 for the MEDs-AD Waiver period FFY 2010-11 through FFY 2013-14. Similarly, on average, 263 new fraud cases were opened during a fiscal year and 239

cases for the last four FFYs (or 260 and 236, respectively, based on the geometric mean[13]). Shading is provided to highlight the major sources (red) and minor sources (green). The major sources of opened new cases are *Qui Tam*[14] and Private Sector sources (e.g.; citizens, employees, providers, recipients, contractors, media) at a relative average of 35.9 percent and 22.2 percent, respectively. The third largest source of opened new cases is AHCA, with a relative average of 18.9 percent (16.0% and 2.9% for AHCA-MPI and Other AHCA, respectively). MFCU is reported with a relative average of 4.7 percent of opened new cases over the years, with DMI (based on FFY 2010-11 through FFY 2013-14 only) at 5.4 percent. DMI added 4.0 percent (= 12/303 x 100%) to the sub-total of opened new cases in FFY 2010-11, 6.2 percent (= 14/227 x 100%) of opened new cases in FFY 2011-12, 1.6 percent (= 3/191 x 100%) in FFY 2012-13 and 8.9% percent (= 21/236 x 100%) of opened new cases in FFY 2013-14. Complaints are, by far, the prime driver of new activities. The same data as Table 7, on opened new cases by MFCU per source, is depicted in Figure 6 in relative terms. Table 8 provides a further breakdown on opened new cases by region; DMI opened new cases versus all other sources of opened new cases, FFY 2010-11 through FFY 2013-14.

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[13] The geometric mean of a set of n positive numbers is obtained by taking the nth root of the product of the same numbers: the geometric mean of 2, 4, and 1 is $\sqrt[3]{8} = 2$. The geometric mean tends to dampen the effect of very high or low values, which might bias the straight average or arithmetic mean.

[14] Qui tam is a lawsuit brought by a private citizen (popularly called a "whistle blower") against a person or company who is believed to have violated the law in the performance of a contract with the government or in violation of a government regulation, when there is a statute which provides for a penalty for such violations. Qui tam suits are brought for "the government as well as the plaintiff." In a *qui tam* action the plaintiff (the person bringing the suit) will be entitled to a percentage of the recovery of the penalty (which may include large amounts for breach of contract) as a reward for exposing the wrongdoing and recovering funds for the government. Sometimes the federal or state government will intervene and become a party to the suit in order to guarantee success and be part of any negotiations and conduct of the case. This type of action is generally based on significant violations which involve fraudulent or criminal acts, and not technical violations and/or errors. Description retrieved from http://dictionary.law.com/default.aspx?selected=1709
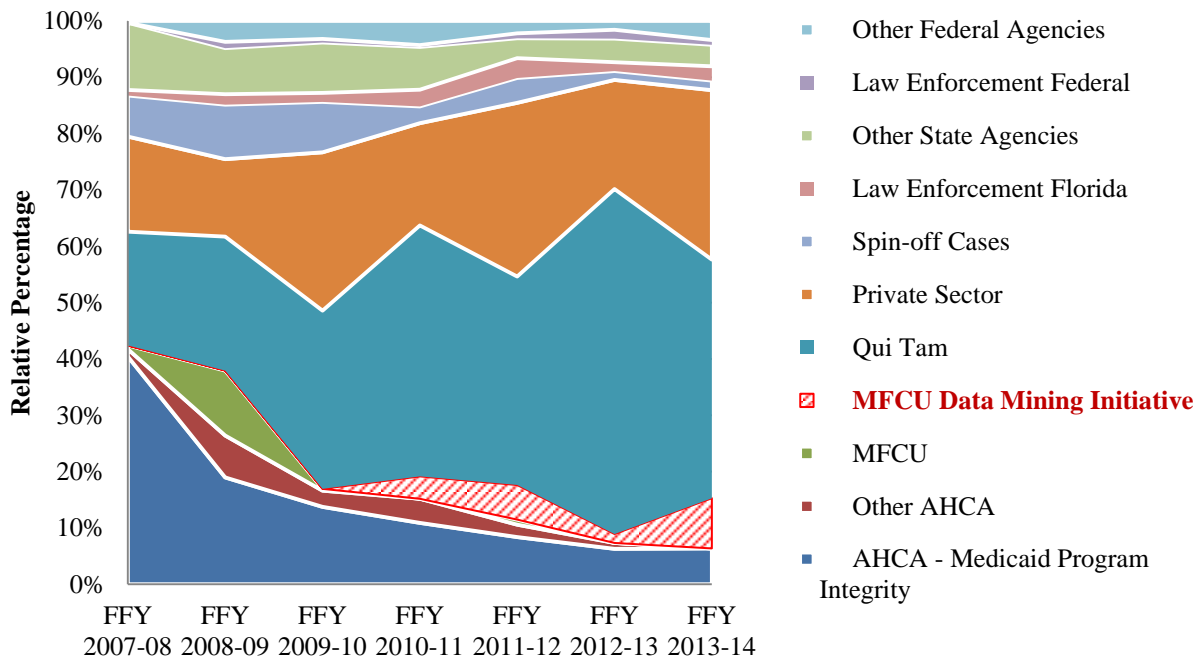
* In FFY 2007-08, biweekly briefings began between AHCA MPI and MFCU with an emphasis on the quality of referrals being made to MFCU.

Figure 6: Relative Shares of Opened New Fraud Cases by Source, FFY 2007-2008 through FFY 2013-14

Table 8: Opened New Fraud Cases by Region; DMI and Other Sources, FFY 2010-11 through FFY 2013-14

	FFY 2010-11		FFY 2011-12		FFY 2012-13		FFY 2013-14		Total	
Central DMI opened	7	**58%**	6	**43%**	3	**100%**	3	14%	19	**38%**
Other opened	54	35%	47	38%	25	36%	36	32%	162	35%
North DMI opened	3	25%	7	**50%**	0	0%	5	24%	15	30%
Other opened	56	36%	42	34%	21	30%	27	24%	146	32%
South DMI opened	2	17%	1	7%	0	0%	13	**62%**	16	32%
Other opened	45	29%	35	28%	24	34%	48	43%	152	33%
Total DMI opened	**12**		**14**		**3**		**21**		**50**	
Total Other opened	**155**		**124**		**70**		**111**		**460**	
Total CCEB	135		89		118		104		446	
Grand Total	**302**		**227**		**191**		**236**		**956**	

Table 8 indicates the number of DMI attributed opened new cases by region and all other sources opened new cases, adding to the total in the last rows of the table. As denoted in Table 8, the Complex Civil Enforcement Bureau (CCEB)[15] is the largest single source for opened new cases, with a relative average of 46.7 percent (446/956) of total MFCU opened new cases for FFY 2010-11 through FFY 2013-14. The spread of opened new cases over the MFCU regions is quite even, with Central Florida at a relative average of 18.9 percent ((19+162)/956), North Florida at 16.8 percent ((15+146)/956), and South Florida at 17.6 percent ((16+152)/956). The percentages indicate relative shares of opened new cases per region, excluding the CCEB opened new cases (e.g., first column 7/12 = 58%; 54/155 = 35%, etc.). The relative shares indicated in red, designate that the regional DMIs added relatively more of the DMI opened new cases to the region, than did all other sources. The variable "opened new fraud cases" will be used for evaluation purposes in section 5 (and Appendix 2).

Table 9 provides a list of the top five Medicaid provider types for Medicaid fraud ranked from most to least frequency of fraud. Shading is provided on recurring provider categories. As evidenced from the table, four provider type categories clearly represent the majority of fraud cases opened.

Table 9: Top Five Medicaid Fraud Cases by Provider Type, FFY 2010-11 through FFY 2013-14

Fraud Cases Opened by Provider Type			
FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14
• Pharmaceutical Manufacturer • Home & Community Based Service • Physician (MD) • Pharmacy • General Hospital / Therapist	• Home & Community Based Service • Pharmaceutical Manufacturer • Physician (MD) • Pharmacy • Medical Equipment Manufacturer	• Physician (MD) • Dentist • Pharmacy • General Hospital • Home & Community Based Service	• Physician (MD) • Case Management Agency • Pharmaceutical Manufacturer • Home & Community Based Service • Pharmacy

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[15] Florida's civil investigations are handled by the Attorney General's Complex Civil Enforcement Bureau, which is part of the Medicaid Fraud Control Unit.

From Table 9, it can be derived that "Physician (MD)" and "Home and Community Based Service" led in the number of opened new fraud cases according to rank, followed by "Pharmacy." Of cases attributed to the DMI, the main categories for opened cases by provider type in FFY 2013-14 were: "Case Management Agency" with 17 cases, "Dentist" with two cases, "Physician (MD)" and "Therapist" with one case each. Given that cases by provider type can only be measured in frequency or rank number, this variable will not be used for further evaluation in section 5.

Table 10 provides an overview of the disposition of MFCU cases closed, FFY 2010-11 through FFY 2013-14. Shading is provided to highlight the major sources. The last four columns provide the same information for cases closed attributed to the DMI as a subset from the total MFCU cases closed.

Table 10: Disposition of MFCU Closed Fraud Cases and Subset of Closed Cases Attributed to the DMI, FFY 2010-11 through FFY 2013-14

Cases: Disposition of Closed Cases	MFCU				of which: DMI			
	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14	FFY 2010-11	FFY 2011-12	FFY 2012-13	FFY 2013-14
Administrative Closure	32	2	9	2				
Administrative Referral	65	55	49	37	1	2	3	4
Assistance to Other Agencies		1	11	1		1	1	
Case Dismissed	22	11	28	23				
Case Remanded	3							
Civil Intervention Declined	5	1	2					
Civil Judgment	2	2	1	3				
Civil Settlement	45	14	37	32				
Consolidated	16	3	11	5				
Conviction	24	9	11	14				
Defendant Deceased			1					
Defendant Filed Bankruptcy	1							
Deferred Prosecution Agreement			1	1				
Fugitive Defendant			16	7				
Investigated by another Law Enforcement Agency				7				2
Lack of Evidence	28	23	37	23	4	3	4	4
Nolle Prosequi	2		1					
Plea Agreement	7	10	25	20				1
Pretrial Intervention	3	2	6	1				
Probation			11	4				
Prosecution Declined		6	9	1				
Resolved with Intervention	1	2	1	2				
Unfounded	18	25	27	12		1	3	3
Unsubstantiated				1				
Voluntary Dismissal	11	21	36	36				
Grand Total Closed Cases	**285**	**187**	**330**	**232**	**5**	**7**	**11**	**14**

As indicated in the table, only a subset of MFCU cases led to civil settlements, convictions, or plea agreements. Over the four FFYs, these categories total 248 cases or 24.0 percent of the total

number of closed cases. The category "Administrative Referral" had a total of 206 cases or 20.0 percent of MFCU cases, "Lack of Evidence" had 111 cases or 10.7 percent and "Voluntary Dismissal" had 104 cases or 10.1 percent. For the DMI, the "Lack of Evidence" category was the prime reason for disposition with a total of 15 cases or 47.8 percent of the cases over the four years. The second reason for disposition is "Administrative Referral" for 10 cases total or 27.0 percent of cases. The third reason for disposition was "Unfounded" in a total of 7 cases or 18.9 percent. Given that the disposition of cases closed can only be measured in frequency or rank number, this variable will not be used for further evaluation in section 5.

2.3   Outcomes: Monies Recovered

A longer term perspective on outcomes of activities by the MFCU, in terms of the total amount of monies recovered, is presented in Figure 7. The average annual amount of monies recovered is $136.6 million. Based on the same data, the compound rate of growth in the amount of recoveries, over the years depicted, is approximately -9.75 percent annually.

$$y = 171,548,025e^{-0.0975x}$$
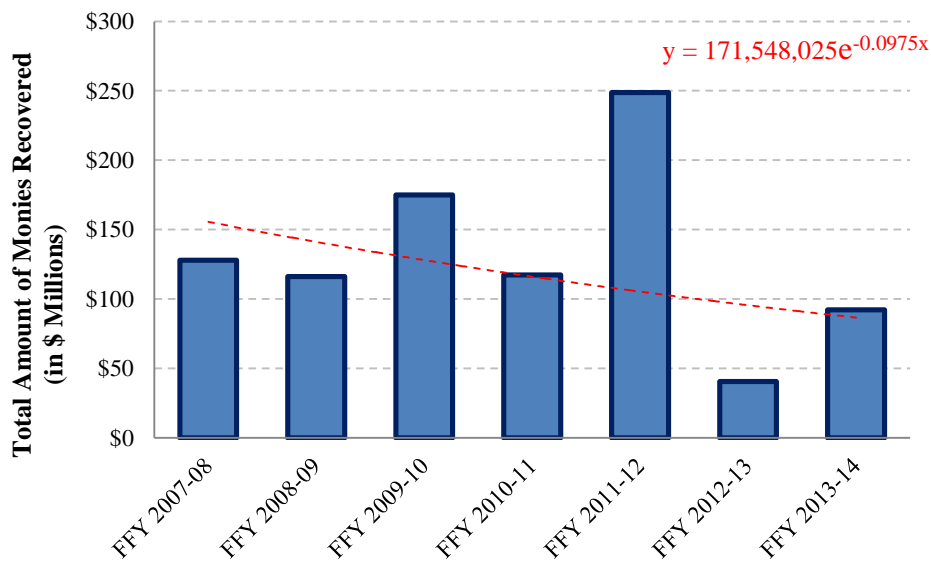
Figure 7: Total Amount of Monies Recovered by MFCU, FFY 2007-08 through FFY 2013-14

Figure 8 compares the number of cases investigated or the caseload (horizontal axis) to the total amount of monies recovered (vertical axis) by MFCU. For the timeframe FFY 2007-08 through FFY 2009-10, only the average is given (AVG FFY 2007-10). For the timeframe FFY 2010-11 though FFY 2013-14, both the individual years and the average is given (AVG FFY 2010-14).
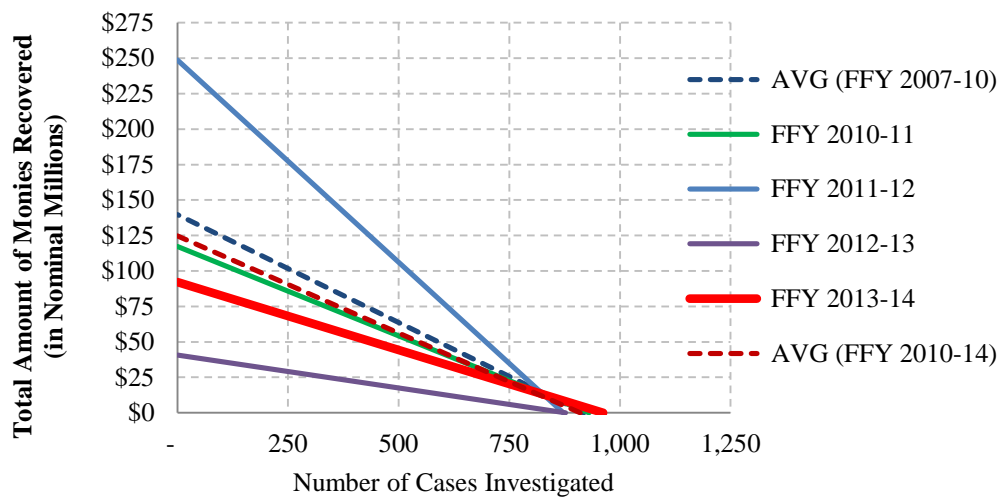

Figure 8: Number of Cases Investigated Relative to the Total Amount of Monies Recovered in Millions, Averages FFY 2007-10 and FFY 2010-14, and individual years FFY 2010-11 through FFY 2013-14

In FFY 2010-2011, MFCU recovered a total of $117.3 million on 930 investigated cases. For FFY 2011-12, the number of cases investigated was 872, with a total sum of monies recovered of $248.7 million. For FFY 2012-13, the number of cases investigated was 877 with a total value in recoveries of $40.7 million. Finally for FFY 2013-14, the number of cases investigated was 962 while the total value recovered was $92.2 million. As evidenced from Figure 8, the number of cases investigated remains rather stable, with an overall average of 914 cases (horizontal axis), while the monies recovered show a spread in outcomes (vertical axis) on a year-to-year basis. Taken on average however, the amount of value recovered for the FFY periods from FFY 2007-08 through FFY 2009-10 as compared to FFY 2010-11 through FFY 2013-14 show nearly similar outcomes. The blue bold dashed line in Figure 8 represents the average ratio of Total

Amount of Monies Recovered (TAMR) divided by Investigated Cases for the FFYs 2007-08 through FFY 2009-10, with 918 cases and $139.7 million in total recoveries, resulting in an average per case value of $152,139. Similarly, the bold red dashed line represents the average ratio of monies retrieved during the MEDs-AD Waiver evaluation period for FFY 2010-11 through FFY 2013-14, with an average of 910 cases investigated at a total value of $124.7 million, or an average per case value of $137,012. In comparing the two periods, the number of cases investigated declined by almost 0.9 percent, while the total value of monies recovered declined by 10.7 percent, effectively meaning a decline of 9.9 percent of value recovered per case investigated, during the MEDs-AD Waiver evaluation timeframe.

Figure 9 depicts the TAMR per FFY 2007-08 through FFY 2013-14 next to the respective Federal Grant Expenditures (Fed Share). In FFY 2010-11, the TAMR by the MFCU was $117.3 million. Part of the recoveries generated through penalties imposed and interest charged were deposited into the State of Florida's General Revenue Fund. For FFY 2011-12, $248.7 million was recovered by the state, while the total amount of monies recovered for FFY 2012-13 was $40.7 million. For FFY 2013-14 the total recoveries amounted to $92.2 million. Included in the $92.2 million was one DMI assigned criminal case which ended in a plea agreement and resulted in a $329,665.17 recovery.
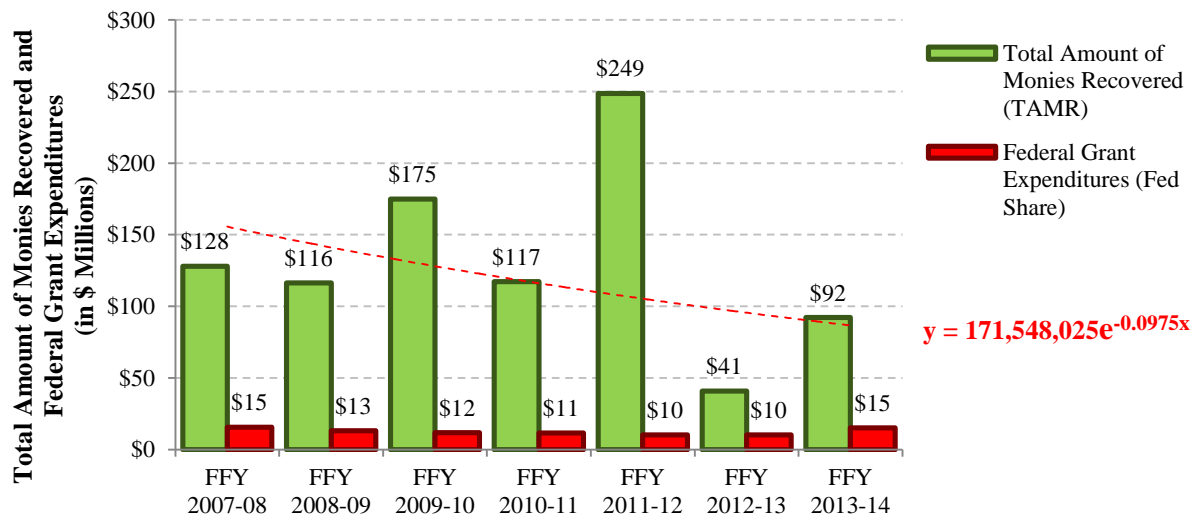
Figure 9: Total Amounts of Monies Recovered and Federal Grant Expenditures, FFY 2007-08 through FFY 2013-14

The benefit-cost ratio for every FFP dollar spent, in FFY 2013-14, was approximately 6.06. This means that for every federal dollar spent, MFCU generated approximately $6.06 (i.e.; a return on investment of 5.06%). In FFY 2012-13, the benefit-cost ratio was approximately $4.03. Similarly, the same ratio on FFP dollars spent in FFY 2011-12 and FFY 2010-11 was 24.53 and 10.27, respectively. The annual benefit-cost ratio over the FFYs depicted is 9.44 (geometric mean). The same ratio under the MEDs-AD Waiver is 8.85 (i.e.; a return on investment of 7.85%). Using the same methodology, the FFY 2013-14 benefit-cost ratio for the DMI, based on the case ending in a plea agreement, was 7.62 (i.e.; a return on investment of 6.62%).

3.   Data Mining Activities: Key Informant Experiences

The data for this evaluation emanates from a series of personal interviews conducted by the principal investigator with specifically selected DMI stakeholders and key informants within the Medicaid Fraud Control Unit (MFCU) and the AHCA Bureau of Medicaid Program Integrity (MPI) organizations. In addition, two inter-agency meetings were attended. The objectives of the interviews were to provide a more nuanced evaluation beyond a quantitative data analyses and evaluation and to provide further insights into developments made with regard to the position and role of data mining within the MFCU and the FL OAG.

First described are insights from various interviews held with MFCU personnel. Second, the researcher's observations from attending an MPI/MFCU biweekly meeting and a DMAR meeting are given. Next, perspectives are provided from interviews with higher level MFCU management. Finally, a report is presented of interviews held with representatives of the AHCA MPI.

Medicaid Fraud Control Unit

AHCA initiated the MEDs-AD Waiver on behalf of the MFCU, and with it, Florida was the first state to have a waiver of this kind granted. Prior to the MEDs-AD Waiver, MFCU was only allowed to data mine under *qui tam* lawsuits. *Qui tam* lawsuits (popularly called "whistle blower lawsuits") are initiated by Florida private citizens. Any other data mining done by MFCU prior to the waiver was considered "phishing".[16]

Since the granting of the MEDs-AD Waiver, there has been a substantial and growing interaction between the two agencies: AHCA MPI and FL OAG MFCU. The first and foremost concern in granting the MEDs-AD Waiver was insuring there was no duplication in data mining efforts by the two agencies.

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[16] Phishing is the act of attempting to fraudulently acquire sensitive personal information.

One of the results of the ongoing cooperation between AHCA MPI and MFCU was that the data analysts began to better integrate knowledge and skills. Before the MEDs-AD Waiver, inter-agency communication was bureaucratic and formal. Now, data analysts are in more direct contact with one another and a simple phone call may bring resolution to an issue. All personnel who participated in the interviews claimed to have a good rapport about analysts from their counterpart agency. Analysts from both sides have become more knowledgeable about the structure of meetings and organized support that is in place. At the same time, they have become more comfortable and confident in each other as evidenced when concepts were bounced around during meetings. From the evaluator's perspective, the effectiveness of the level of communication and information shared has greatly improved. It was conveyed by more than one party that there was definitely better and more effective communication in meetings and there was good rapport between the staff. In addition, it was mentioned by several interviewees that "presently we have a good team of people working together."

A second observation was in regard to MFCU's concerns about the position of data miners or data mining activities within the MFCU. Presently, the three data miners are set at a 0.75 FTE total level of effort. This small base, given the high turnover potential among the data miners, constitutes a potential risk for the MFCU. Therefore, more personnel have been assigned data mining tasks. In fact, two persons are now trained and prepared to conduct data mining, in addition to the three personnel currently assigned to the task.

Additionally, several interviewees stated that the number of data miners should be doubled to five or even six data miners at 0.15 FTE level of effort each. The reasons provided are twofold; first, AHCA wants to move toward more targeted case management, thus assigning data miners with more tasks concerning a specific case. Second, AHCA wants to further institutionalize data mining within the MFCU organization by having more staff engaged in data mining activities. Data miners and data mining activities are indeed becoming a more integral part of the MFCU team and data miners even accompany teams in field operations to identify and report on issues pertaining to retaining data and information. The opportunity to conduct in-depth research was based on the capability of the MFCU to more effectively utilize its ground resources. Finally,

mention was repeatedly made on an upcoming initiative, negotiated with the AHCA SAS data provider, to provide an assessment of potential fraud and abuse leads.

Bureau of Medicaid Program Integrity / Medicaid Fraud Control Unit Biweekly Meeting and Data Mining Analyst Report Meeting

For this evaluation, both AHCA MPI/MFCU bi-weekly and DMAR meetings were attended. Improvements in communication were evident. Potential cases were better understood between both agencies and resulted in more timely focus on action steps being assigned. By no means were cases ready for adjudication, but more people present seemed to be knowledgeable on the various cases' status and all readily provided comments that were well-taken. The bi-weekly meeting agenda moved quickly and good progress was made on developing and moving cases to resolution. In short, the meeting appeared to be highly efficient and effective. The same holds for the DMAR meeting in which approximately ten DMAR cases were handled, leaving ample room for additional issues and information exchange. It was expressed by MPI and MFCU that they have a good relationship and that data analysts are working together toward a common goal.

The level of synergy and sense of a common goal was also demonstrated during a discussion about the new AHCA SAS data provider, which is developing its own fraud detection algorithms. According to the agreement with the data provider, SAS is scheduled to begin delivering potential fraud and abuse leads in substantial amounts during 2015. The new SAS initiative is in addition to the data mined and projects developed by both agencies under the DMI. If the SAS effort is successful, it will add substantially to the workflow and both MPI and MFCU will need additional resources to manage the new cases discovered by SAS.

Medicaid Fraud Control Unit: Data Mining Initiative - Added Value

Key informant interviews were also held with high ranking management personnel. The objective was to obtain an understanding of potential contributions from data mining activities to the MFCU and the FL OAG. It was acknowledged that the basis or common denominator for communication between MFCU and MPI was the MEDs-AD Waiver. With the present partnership and communication structure now in place, a strong two-way communications have

developed. Each team, MFCU and MPI, has a clearer understanding of what the other team is looking for in its data mining requirements and activities. Communication improved by not speaking as three regions (North, Central, and South) as before, but as one voice. In addition, the strong two-way communications have evolved from "idea" or case discussion, aiming at "low hanging fruit," to a higher conceptual level of discussion.

Both MFCU and MPI have different stakes based on the MEDs-AD Waiver, though they strive for the same objective: to detect and possibly reduce abuse and fraud. The different stakes are based on the different "cultures" of both organizations, from the administrative oriented (MPI) to the more law enforcement oriented (MFCU). Also, management styles differ due to this structural difference, but also due to the personal management style of administrators. Both parties involved seem to adapt their communication quite well to the circumstances of the cultural differences. MPI is the larger organization with more manpower and specific expertise drawing from different bureaus, while the data analysts with the MFCU are, though specialists in their own right, more generalists. All personnel seem to be coming together on tasks and projects, even though the MFCU data analysts oftentimes need to dig further into data to substantiate a potential fraud case. The collaborative aspect, based on trust built over time was most apparent. Additionally, both agencies recognize the importance of their growing collaboration as Medicaid managed care expands.

Retaining data mining expertise is an issue; however, turnover can be cushioned a bit by broadening the base of data mining activities. There is potential room for two additional data miners and MFCU key informants have acknowledged that there is more work ahead, given the new agreement with the AHCA SAS data provider

The unique character and dynamics between personnel of both analyst groups was recognized and it was expressed that it was worth sustaining. In addition, further steps have been taken to institutionalize data mining activities within MFCU, e.g., building it into potential career paths, promotions, etc. Key objectives will remain the enhancement of analyses and the resolution of fraud cases.

It was recognized that the organization was learning how to incorporate data mining into the fraud detection process and was making the best use of its promise and capability. Law enforcement personnel and other new members of the MFCU organization were required to meet with data mining specialists to enhance their understanding of their roles and responsibilities. Some suggestions to institutionalize progress were mentioned, but the discussion is ongoing, as it was realized that more work needs to be done in developing a comprehensive team.

Finally, it was recognized that it was not all about detecting and recovering funds, but also about prevention of fraud. As a result of data mining activities, the agencies have recognized that problems in current legislation need to be addressed to prevent fraud. Presently, legal issues are referred back to the legislature under a "call for suggestions" or "program recommendations." For example, a non-Medicaid doctor should not prescribe Medicaid compensable prescriptions to Medicaid recipients. Critical lessons learned from the DMI need to revert back to the legislature to potentially decrease or prevent the front end abuse and fraud opportunities. It was clear from key informant interviews that the MFCU understands the valuable role data mining plays in cutting-edge fraud prevention, detection, and adjudication.

Florida Agency for Health Care Administration (AHCA)

The MPI unit conducts extensive research on providers, medical practices, claims, billings, and payments using its expertise in health care administration, legislation, and medical practice. Presently, of the 96 FTEs assigned to MPI, six FTEs are assigned to MPI's data mining activities. The results of the data mining activities of the six FTEs are given to a "detection group" and, in turn, forwarded to the "case management group" within the MPI unit. The case management group decides the further disposition of cases under active investigation. Upon their direction, a project may be dropped, additional records requests made, or projects or cases referred to the MFCU for law enforcement and legal action.

The expertise of the MFCU, with its specific expertise based on field work related operations, was highly appreciated, but provides a different perspective on data than the usual or standard

MPI practice. The purpose of data mining could be enhanced by focusing more on themes carried by both organizations. Direct subject matter expertise and special experience could be brought into the inter-agency meetings on a need-to-know basis. Also, better feedback on the data mining efforts and better appreciation of the value of a data mining activity may raise the sense of a common purpose between the agencies.

Next, an important step forward is the upgrading of case management software. This upgrade will include better tracking of time spent on cases and will signal cases that are idle for too long. In addition, it will improve accountability and work in progress.

Finally, it was relayed by AHCA management that some consistency in data mining "inter-agency" activities was missing. This may, in part, be due to the turnover in management[17], with each new manager having its own perception on the role of and the inter-agency sharing of data mining, the structuring of the inter-agency cooperation, or the differences in culture between the agencies.

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[17] E.g.; the present MPI Interim Chief has been in the position since July 2014.

4.   Significant Case Highlights – Case Summaries

Data Mining Analyst Report Summaries:

This section contains a summary of DMAR projects and the resulting complaints/cases attributed to the DMI initiative. Next to the titles and DMAR numbers, short summaries are provided on the project, objectives, date of service range, and conclusions. DMAR projects can lead to more than one Medicaid Fraud Control Unit (MFCU) complaint/case. While some DMAR projects are complete and closed, others are active and ongoing.

🞣 DMAR-001 School Based Services

Objective: The objective of this data mining analysis was to identify outliers who provide services within a school environment. Provider type category or any associated provider type that operates in a place of service identified as a school in the amount or excess of twelve (12) hours per date of service.

Date of Service Range: 07/01/2008 – 06/30/2014

Conclusion: The MFCU opened three complaints which were then opened as cases as a result of this DMAR. In one case, there has been a conviction of one occupational therapist. The defendant is to receive 30 years of probation and ordered to pay $329,665.00 in restitution, investigative costs, and fines. One case was closed with an administrative referral to AHCA for their follow-up. One case is currently in active status. In addition, the data mining analyst is still reviewing data for additional complaints to be opened.

🞣 DMAR-010 Stents Analysis

Objective: Review of stent procedure codes 92980 (transcatheter placement of an intracoronary stent(s), percutaneous, with or without other therapeutic intervention, any method; single vessel) and 92981 (transcatheter placement of an intracoronary stent(s), percutaneous, with or without

other therapeutic intervention, any method; each additional vessel) to determine if there were providers billing these codes without the necessary or appropriate diagnosis codes.

Date of Service Range: 01/01/2007 – 12/31/2010

Conclusion: The top treating provider outliers for stent procedures were returned to AHCA Bureau of Medicaid Program Integrity (MPI) for actions as they deem appropriate.

⚜ DMAR-011 Nursing Home Project: Recipients vs. Beds

Objective: The objective of this data mining analysis was to identify nursing homes that were billing for more recipients than the license allowed number of beds.

Date of Service Range: 01/01/2009 – 05/14/2013

Conclusion: Two MFCU complaints were opened to further investigate an apparent excess of recipients (beds) than the license allows. Both complaints have since been closed with no further action required.

⚜ DMAR-013 Pill Mill Analysis: Oxycodone Prescribers 15/30mg

Objective: The objective of this data mining analysis was to identify those practitioners who were prescribing high volumes of Oxycodone 15mg and 30mg tablets within the Florida Medicaid program while lacking medical claims to support such prescribing. The focus on the 15mg and 30mg tablets was necessary as it has been confirmed by the FDLE that these are the drugs of interest in reference to the newly developed "Strike Force" within the State of Florida that has been charged with pursuing Florida's current "pill mill" clinic and prescription drug criminal activity.

Date of Service Range: 01/01/2009 – 04/11/2011

Conclusion: The identification of top Oxycodone prescribers led to the opening of 22 MFCU complaints. Fourteen of the 22 MFCU complaints were converted to MFCU cases and one remains as an ongoing active investigation. Additional information was shared with AHCA MPI in which AHCA took action and subsequently terminated over 400 prescribers' rights.

🞦 **DMAR-015 Spinal Fusion Analysis**

Objective: To identify those Medicaid recipients with higher occurrences of spinal fusion procedures within the Florida Medicaid claims data and to determine possible physician outliers within the Medicaid program for further investigation of fraudulent or medically unnecessary treatments.

Date of Service Range: 07/01/2008 – 03/31/2011

Conclusion: Three MFCU complaints were opened to further investigate an excess of services provided to recipients. Two complaints were converted to MFCU cases. One case was closed and the other was referred to AHCA MPI. One complaint was closed with no further action.

🞦 **DMAR-016 Hemophilia Analysis**

Objective: This data mining initiative involved identifying drugs utilized for the treatment of hemophilia and identifying outliers billing for these pharmaceuticals.

Date of Service Range: 01/01/2009 – 10/31/2012

Conclusion: One MFCU complaint was opened. The complaint was closed as unfounded when the investigation revealed a clerical error on the part of the pharmacy entering the doctor's license number incorrectly. Additional outliers were sent to AHCA MPI as a result of this DMAR.

🞦 **DMAR-018 Large Amounts of Dental Billings**

Objective: This data mining initiative involved comparing billings to other dental providers to determine if billings were higher than average under certain procedure codes.

Date of Service Range: 04/01/2012 – 08/31/2014

Conclusion: This is an active DMAR with the assigned analyst continuing to review data. To date, MFCU has opened two complaints. One was converted to a case and is active. One complaint has been closed and was referred to AHCA for their administrative follow-up.

➕ DMAR-020 Personal Care Assistance (PCA) Services

Objective: To conduct an analysis of PCA services for the Developmentally Disabled (DD) under the Medicaid waiver services program to identify outlier providers who may have overbilled.

Date of Service Range: 01/01/2009 – 06/30/2011

Conclusion: This data mining initiative identified four provider outliers that were opened as MFCU complaints with two additional provider outliers already under active investigation by the MFCU. Three of the MFCU complaints were converted to MFCU cases. Two cases were closed with no further action required while one case was referred to AHCA for their administrative follow-up. One complaint was closed with no further action.

➕ DMAR-021 Speech Therapy Services

Objective: To conduct an analysis of Speech Therapy Services for the DD under the Medicaid waiver services program and the Medicaid program to identify outliers who billed in excess of eight units per day (DD Waiver), or in excess of four units per day (Speech Therapy Services "State Plan"), or for services rendered to recipients age 21 and over.

Date of Service Range: 01/01/2009 – 06/30/2011

Conclusion: Nine providers were identified as being outliers with three opened as MFCU complaints. One complaint was converted to a case. The investigations did not find criminal conduct. Results, including administrative issues, were sent to AHCA MPI.

➕ DMAR-022 Respiratory Therapy Services

Objective: To conduct an analysis of Respiratory Therapy Services for the DD under the Medicaid waiver services and Medicaid program to identify the outliers of utilization for Respiratory Therapy Services and/or procedure codes.

Date of Service Range: 01/01/2009 – 02/16/2012

Conclusion: There were no findings of concern. Results were sent to AHCA MPI.

✦ DMAR-025 Obstetrical (OB) Urinalysis Unbundled

Objective: The objective was to identify unbundled urinalysis procedure codes for OB Care Services.

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: This data mining initiative identified four providers as being outliers for which the MFCU opened four complaints. One complaint was converted to a case and in this investigation MFCU has entered into civil negotiations with a provider. Three complaints were referred to AHCA MPI for their administrative follow-up.

✦ DMAR-028 OB Hematology Unbundled

Objective: The objective was to identify unbundled hemoglobin and hematocrit procedure codes for OB Care Services.

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: Results identified a single provider as an outlier and the results were returned to AHCA MPI.

✦ DMAR-029 OB Drug Screen Unbundled

Objective: The objective was to identify an unbundled OB Drug Screen procedure code for OB Care Services.

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: There were no findings of concern. Results were sent to AHCA MPI.

✦ DMAR-031 Chiropractic Manipulative Treatment (Five Regions)

Objective: To identify outliers within the Chiropractic provider specialty type who were possibly up-coding from regular office visits to treatment for each of the five spinal regions.

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: Results regarding two outliers were sent to AHCA MPI for further review.

DMAR-033 OB 626 Diagnosis Urinalysis

Objective: The objective was to identify procedure codes for OB Care Services that may be padded, unbundled, or up-coded. Billing for labs and/or evaluation and management procedure codes where initial prenatal OB Care Services are provided.

Date of Service Range: 01/01/2009 – 09/14/2011

Conclusion: There were no findings of concern. Results were sent to AHCA MPI.

DMAR-035 Analysis Procedure Code S5100U2

Objective: To identify those Medicaid providers who were billing the maximum units of service per day per recipient for procedure code S5100U2 (Adult Day Health Care).

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: Four providers were identified who billed the maximum units of service per day for multiple recipients. The results were sent to AHCA MPI.

DMAR-036 Power Wheelchairs and Power-Operated Vehicles (POV)

Objective: To determine if there was some type of major event or a decline in health to justify a power wheelchair or POV claim. A POV is a three-wheeled battery operated vehicle also known as a scooter.

Date of Service Range: 01/01/2010 – 06/30/2011

Conclusion: It was determined that this study could not be completed based only on Medicaid claims, but would require obtaining patient medical charts. Results were sent to AHCA MPI.

DMAR-038 Evaluation and Management New Patient Codes Analysis

Objective: To determine and identify those providers that bill an Evaluation and Management Code for a "New Patient Visit" on a recipient that has been provided professional care by the provider group within the three year time frame. The following were the procedure codes reviewed: 99201, 99202, 99203, 99204, and 99205.

Date of service range: 01/01/ 2009 – 04/08/2014

Conclusion: This data mining initiative identified five providers as being outliers for which MFCU opened five complaints. Three complaints remain open and one complaint has been closed. One complaint has been converted to a case and is ongoing.

♦ DMAR-039 Respite Care Duplication of Services

Objective: To identify provider outliers billing Respite Care Services at the same time as Personal Care Services, as this is a violation of Medicaid policy.

Date of Service Range: 01/01/2008 – 06/30/2011

Conclusion: The MFCU opened six complaints pertaining to this analysis. Four complaints were closed with no further action. Two complaints were converted to cases. One case was closed with no further action required and one was referred to AHCA MPI to be settled by AHCA with a civil judgment.

♦ DMAR-040 Dental Area Standard

Objective: Determine a Dental Area Standard based on all dental provider type claims. This standard was set by the percentage of claims by each procedure code. The goal was to determine if the standard percentages are in line with what is being billed/paid in each county.

Date of Service Range: 01/01/2011 – 06/30/2011 and 01/01/2012 – 06/30/2012

Conclusion: This data mining initiative identified several providers who exceeded the standard deviations from the norm. The MFCU opened nine complaints for investigation. Four complaints were closed with no further action required. One was an administrative closure with information sent to the DOH to assist in their ongoing investigation. One was consolidated into an ongoing MFCU investigation. One was referred to AHCA for their administrative follow-up. Two were converted to MFCU cases, of which, one case was closed with no further action required and one case was referred to AHCA MPI.

♦ DMAR-044 Zyprexa Dispensing and Prescribing

Objective: To identify the top dispensers of Zyprexa and subsequent top prescribers who may have prescribed this expensive drug unnecessarily.

Date of Service Range: 01/01/2008 – 12/31/2010

Conclusion: The MFCU opened two complaints pertaining to this analysis. They were subsequently closed, one with no further action required and the other referred to AHCA MPI.

DMAR-043 Lidoderm Dispensing and Prescribing

Objective: To identify the top dispensers of Lidoderm 5% and subsequent top prescribers who may have prescribed this expensive drug unnecessarily.

Date of Service Range: 01/01/2008 – 12/31/2010

Conclusion: This data mining initiative identified nine top prescribers of Lidoderm who also prescribe Lidoderm "off-label," i.e., using the drug for different conditions other than for which it was officially approved by the U.S. Food and Drug Administration. Currently this is allowable by the State of Florida; therefore, MFCU did not open complaints. The results were sent to AHCA for further review along with a recommendation that the State of Florida Medicaid program develop policies and protocols that address "off label" Lidoderm prescriptions.

DMAR-045 Abilify Dispensing and Prescribing

Objective: To identify the outlying dispensers of Abilify, an expensive drug, determine the top associated prescribers for those outlying dispensers, and attempt to establish if a pattern of fraud exists.

Date of Service Range: 01/01/2008 to 12/31/2010

Conclusion: MFCU had several of the physicians identified in this initiative as current active case investigations so the resulting analysis information was merged in those cases. Two additional MFCU complaints were opened and subsequently closed with no further action.

DMAR-047 Procedure Code 53085 Analysis

Objective: To identify those providers that billed and subsequently reimbursed for procedure code 53085-Drainage Perineal Urinary Extravasation, for female recipients. This code is only utilized on the male recipient population; however, according to the U.S. Department of Justice, there have been several arrests around the nation relating to healthcare fraud pertaining to this scenario.

Date of Service Range: 07/01/2008 – 06/30/2011

Conclusion: There were no findings of concern. Results were sent to AHCA MPI.

DMAR-049 Paravertebral Injection Codes Analysis

Objective: To identify those providers that bill excessively and were reimbursed for procedure codes involving paravertebral injections which require sterile environments, ample preparation, and post injection observation.

Date of Service Range: 01/01/2008 – 12/31/2011

Conclusion: The results for outlier providers were sent to AHCA MPI.

DMAR-050 Therapy Services with No Assistant Codes

Objective: To identify those therapy providers that bill, and were subsequently reimbursed, for therapy services without any assistant codes identified in the claim population. This is a possible indicator of up-coding and/or unqualified or screened staff servicing Medicaid recipients.

Date of Service Range: 07/01/2008 – 06/30/2011

Conclusion: Multiple outliers were identified leading to the opening of two MFCU complaints and four other outliers were identified who had been or are subjects of active MFCU investigations. Two complaints were converted to cases. One remains an active investigation and one was closed as an administrative referral to AHCA MPI.

DMAR-051 Dental Analysis: Sealants vs. Single Surface Fillings

Objective: To determine and identify those providers that bill in excess of D2391 single surface fillings in comparison to D1351 sealants, as single fillings are reimbursed at a higher rate. This is an up-coding scenario.

Date of Service Range: 07/01/2008 – 12/31/2011

Conclusion: The MFCU opened three complaints pertaining to this analysis. One of the complaints was converted to an MFCU case, but has since been closed with no further action required. One complaint was referred to AHCA MPI for medical record review and one complaint was referred to AHCA for administrative follow-up.

DMAR-053 Diagnosis 7795 Study and Analysis

Objective: To identify those Medicaid recipients who have associated claims related to diagnosis code 7795, Newborn Withdrawal Syndrome, then track to associated mother's prescribing activity in an effort to identify outlier prescribers that prescribed highly abusive and addictive prescription drugs to pregnant women.

Date of Service Range: 01/01/2008 – 01/17/2012

Conclusion: The MFCU opened one complaint pertaining to this analysis. While no criminal conduct was uncovered, information was referred to DOH for licensure issues.

DMAR-064 HIV: Pharmacy and Prescriber Outlier Analysis

Objective: To identify any outlier pharmacies and prescribers with regard to HIV drugs.

Date of Service Range: 11/01/2010 – 04/30/2012

Conclusion: Resulting information of the number one outlier was sent to AHCA MPI.

DMAR-070 Targeted Case Management

Objective: To identify the highest paid providers for this provider type statewide and conduct an analysis and research claims data to determine if providers are overbilling for targeted case management which would lead to billing for services not rendered.

Date of Service Range: 01/01/2011 – 06/30/2014

Conclusion: Twenty seven complaints were opened. Five complaints have been closed and consolidated into active case investigations, two were closed as unfounded and one was referred to AHCA MPI. Seventeen complaints were converted to 17 case investigations. One case has resulted in three individuals being arrested. Three cases have resulted in search warrants being executed. It is anticipated there will be additional arrests in several of the cases. Two cases were referred to AHCA MPI and one has been closed as unfounded.

Referrals Only

There were three DMARs submitted to AHCA during the time period 10/01/2013 and 09/30/2014. All were denied by AHCA.

DMAR-075: Fraudulent Dispensing/Prescribing of Ketamine HCL

Objective: Identify the outlying dispensers of Ketamine.

Date of Service Range: 01/01/2010 - 12/31/2013

Conclusion: This DMAR was denied by AHCA.

DMAR-076: Auto-Refills

Objective: Identify providers from provider type – pharmacy with the highest dollar amount denied from claims for recipients with a date of death predating the date of service.

Date of Service Range: 01/01/2010 - 12/31/2013

Conclusion: This DMAR was denied by AHCA.

DMAR-077: Up-Coding Well Child Checkups

Objective: Identify physicians (MD or DO) who were billing for well child checkups when the service was performed by an ARNP or PA.

Date of Service Range: 01/01/2010 - 12/31/2013

Conclusion: This DMAR was denied by AHCA.

In summary, the data mining activities (FFY 2010-11 thru FFY 2013-14) led to the MFCU opening 102 complaints. Forty-seven complaints have been closed, five have an ongoing active status and 50 complaints were converted to full case investigations by the MFCU. Of the 50 case investigations opened, 30 have been closed and 20 cases have an ongoing active status. Four individuals have been arrested as a result of the DMI and one case ended in a plea agreement and resulted in a $329,665.17 recovery. There have been a total of 20 MFCU complaints or cases referred to AHCA MPI for any action they deem necessary.

5.   Conclusion

Admittedly, the correct metrics of operation or modus operandi on data mining has not been determined yet, but important progress has been made, both within the Medicaid Fraud Control Unit (MFCU) and between the agencies. It is recognized that the organization itself is learning how to incorporate and make the best use of the data mining opportunities.

The DMI plays a unique role and is on the cutting edge of Medicaid fraud detection, criminal and civil adjudication, monetary recovery, and fraud prevention. This comprehensive evaluation suggests that the intentions of the MEDs-AD Waiver are being met. Closer coordination between the two agencies exists because of the DMI and the State of Florida is better positioned to more expeditiously address emerging changes to these threats.

Pursuant to the MEDs-AD Waiver, granted on July 15, 2010, and the subsequent MOU signed between AHCA and the FL AG, on September 13, 2010, this section presents an evaluation of the MEDs-AD Waiver: data mining activities. On the evaluation of the DMI at the MFCU at the Florida Attorney General's Office, the question is whether or not the data mining MEDs-AD Waiver, as a demonstration project, added significantly to the results of Medicaid fraud investigations in the State of Florida.

Given that the DMI cannot be seen apart or isolated from the activities conducted within the MFCU of the FL AG, or from the inter-agency activities with AHCA, the Structure-Conduct-Performance Paradigm (SCPP) framework is used. This framework puts the DMI in its proper perspective, namely as an added asset to the MFCU.

Various input, throughput, output, and outcome variables were described. Of the described variables, however, only a limited set proved useful for further analyses to properly represent the position of the data mining activities within the MFCU (limitations are notably due to the present

status of development of the data mining activities, i.e.; limited data, values being recovered on one case so far, rather constant or fixed FTEs, qualitative data, etc.).

The number of fraud complaints received and attributable to the MFCU DMI were 27 for FFY 2010-11, 16 each for both FFY 2011-12 and FFY 2012-13, and 43 for FFY 2013-14. The numbers of opened new fraud cases attributable to the DMI were 12 for FFY 2010-11, 14 for FFY 2011-12, 3 for FFY 2012-13, and 21 for FFY 2013-14. The incidence ratios of opened new fraud cases divided by the number of complaints were 0.444, 0.875, 0.188, and 0.6, respectively (see Appendix 2; Figure 11 and Table 12). Opened new fraud cases attributed to the DMI were, on average, 5.1 percent of the total opened new fraud cases over the four years of the MEDs-AD Waiver. Exclusive of the Complex Civil Enforcement Bureau (CCEB) data, the DMI average was 10.4 percent of the opened new fraud cases.

The average annual value in monies recovered by the MFCU was approximately $124.7 million for the period FFY 2010-11 through FFY 2013-14. The comparable value for the prior period, FFY 2007-08 through FFY 2009-10, was $139.7 million, constituting a decline of approximately 10.7 percent. With a drop in the number of cases investigated by almost 0.9 percent, this effectively indicated a decline of 9.9 percent of value recovered per case investigated during the MEDs-AD Waiver evaluation timeframe. For every FFP dollar spent; approximately $10.27 was recovered in FFY 2010-11, $24.53 in FFY 2011-12, $4.03 in FFY 2012-13, while in FFY 2013-14 the recovery was $6.06 for every FFP. Included in the $92.2 million recovered for FFY 2013-14 is one DMI assigned criminal case, which resulted in a plea agreement and a $329,665.17 recovery.

In summary, the data mining activities (FFY 2010 to date) led to 102 MFCU complaints, of which 50 were converted to MFCU cases. Additionally, 61 data mining referrals were sent to the MPI by the MFCU for administrative actions, as MPI deemed appropriate and necessary, together with nine direct referrals. Several data mining exercises were also provided to AHCA MPI for informational purposes.

Over the FFY 2010-11 through FFY 2013-14 MEDs-AD Waiver period, a total of 37 cases attributed to the DMI were brought to a close with the following dispositions: 15 for lack of evidence, 10 resulted in administrative referral, 7 were unfounded, 2 cases were supporting cases to another agency, and 2 were left for another agency to investigate, while one case ended in a plea agreement. Other cases are still in progress due to the short timeframe of this evaluation period and the occasional time consuming nature of these investigations.

Although expectations on the initiative were high, they have not yet been achieved. Admittedly, the right metrics of operation, or modus operandus, has not been determined to date. It is recognized that the organization itself is learning how to fit in and make the best use of the data mining opportunities. MFCU has made some progress.

Static explanatory analyses of the efficiency of DMI indicate that the ratio of DMI assigned opened new fraud cases divided by fraud complaints, on average, was 0.506 and the ratio of cases disposed divided by opened new fraud cases was 1.016 (see Appendix 2; Figure 11 and Table 12). Comparable average ratios of the MFCU in total were 0.299 and 1.043, respectively (see Appendix 2; Figure 10 and Table 11). Comparing the two ratios gives credence to the observation that DMI seems to have significantly improved on MFCUs' activities. In short, the efficiency of the DMI stands out with respect to the MFCU total.

A multivariate regression analysis was used to test the descriptive results from a more dynamic perspective (i.e.; under ceteris paribus or slightly changed scenarios (see Appendix 2; Figure 12, 13, and Table 13)). The outcome of the analyses was that the MFCU expenditure (to the extent of the DMI expenditures in FFY 2013-14) would, in theory, have led to only 2 more opened new fraud cases. However, the change in operations within the MFCU, due to the MEDs-AD Waiver, led to 21 more opened new fraud cases overall, with an additional 2.78 FTEs for data miners only (cost-effect and substitution effect inclusive) in FFY 2013-14. No dynamic explanatory relation was found between any measure of input and cases investigated, cases closed, or monies

recovered. The one DMI case ending in a plea agreement, though with a high recovery value, as compared to the averages per case, does not constitute a trend.
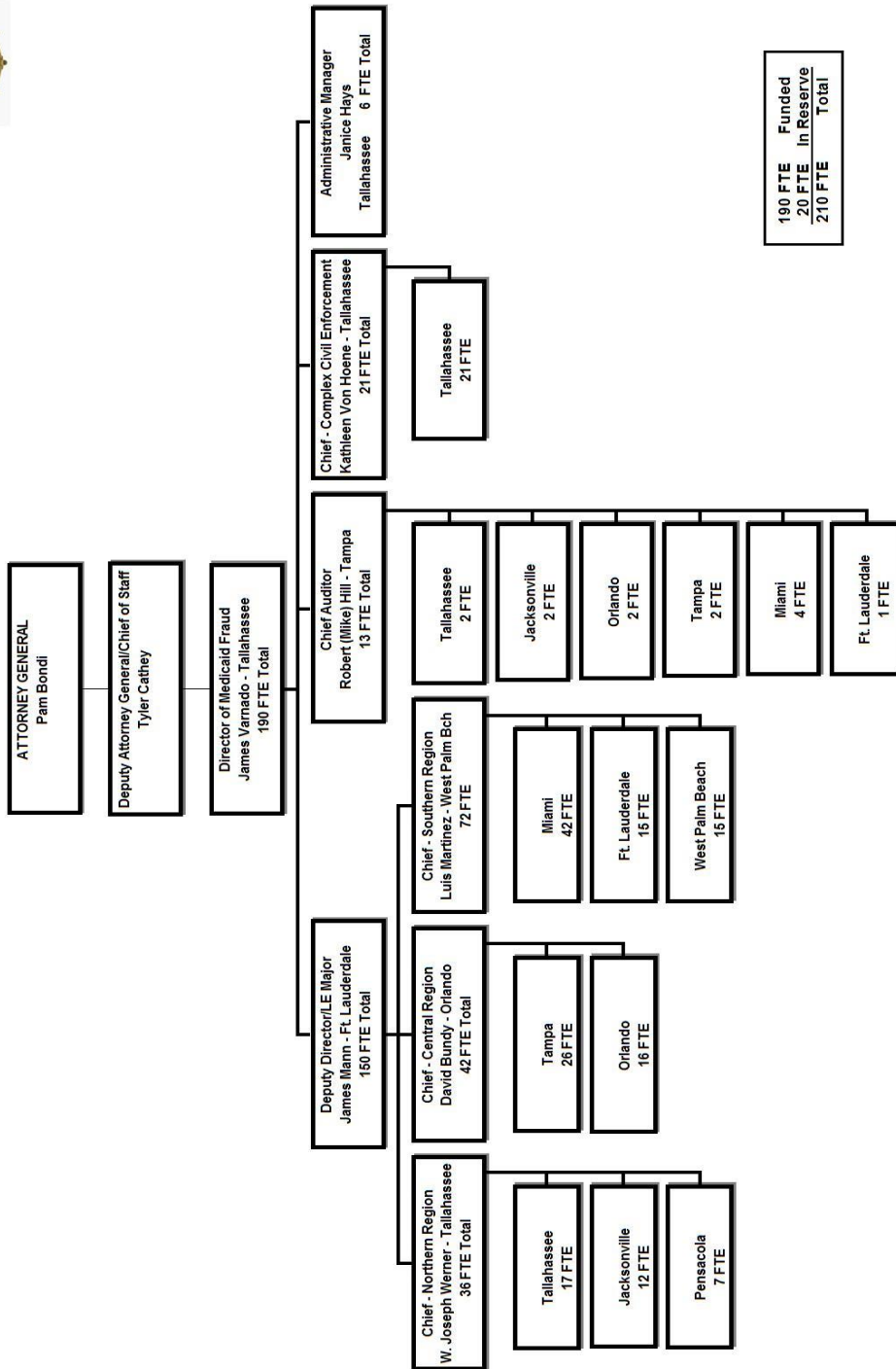
Additionally, the two organizations, the FL AG MFCU and the AHCA's MPI, have established formidable and direct communications leading, in time, to a potential high return on investment. A symbiotic relationship has formed and has led to added learning, new understanding, and increased effectiveness in data mining activities and case development, particularly at the high specialist level within the organizations.

As noted previously, the DMI plays a unique role and is on the cutting edge of Medicaid fraud prevention, detection, criminal and civil adjudication, and monetary recovery. Unfortunately, history has taught us that as more fraud cases are brought to a close, fraud and abuse perpetrators will become more ingenious. This evaluation suggests that the intentions of the MEDs-AD Waiver are being met, closer coordination between the two agencies exists because of the DMI, and the State of Florida is better positioned to more expeditiously address emerging changes to these threats.

Appendix 1:   Operational Organizational Chart Office of the Attorney General Medicaid Fraud Control Unit

**OFFICE OF THE ATTORNEY GENERAL
MEDICAID FRAUD CONTROL UNIT
OPERATIONAL ORGANIZATION CHART
12/22/2014**

ATTORNEY GENERAL
Pam Bondi

Deputy Attorney General/Chief of Staff
Tyler Cathey

Director of Medicaid Fraud
James Varnado - Tallahassee
190 FTE Total

Administrative Manager
Janice Hays
Tallahassee   6 FTE Total

Chief - Complex Civil Enforcement
Kathleen Von Hoene - Tallahassee
21 FTE Total

Tallahassee
21 FTE

Chief Auditor
Robert (Mike) Hill - Tampa
13 FTE Total

Tallahassee
2 FTE

Jacksonville
2 FTE

Orlando
2 FTE

Tampa
2 FTE

Miami
4 FTE

Ft Lauderdale
1 FTE

Deputy Director/LE Major
James Mann - Ft. Lauderdale
150 FTE Total

Chief - Southern Region
Luis Martinez - West Palm Bch
72 FTE

Miami
42 FTE

Ft Lauderdale
15 FTE

West Palm Beach
15 FTE

Chief - Central Region
David Bundy - Orlando
42 FTE Total

Tampa
26 FTE

Orlando
16 FTE

Chief - Northern Region
W. Joseph Werner - Tallahassee
36 FTE Total

Tallahassee
17 FTE

Jacksonville
12 FTE

Pensacola
7 FTE

190 FTE   Funded
20 FTE   In Reserve
210 FTE   Total

Appendix 2:   Explanatory Analyses

In principle, an evaluation looks from plan to budget, and, in particular, to program execution. It brings out cost and quantity differences (efficiency), as well as with respect to market results, price and quantity differences (effectiveness). In this case, the absence of documented monetary recoveries resulting from the DMI limits the ability to calculate a benefit-cost or a return-on-investment. However, given this constraint, and in following the concept of input, throughput, output, and outcome, Figure 10 on the following page provides a recap of some key output data points, or achievements, from Section 2 of this report that led to meaningful conclusions. The figure shows, at one glance, the Medicaid Fraud Control Unit (MFCU) back-to-back ratios from complaints to cases ending in settlement, conviction, or plea agreement (counter clock-wise). The right-hand side of the horizontal axis show two scales, the upper scale is the number of complaints and the lower scale are the cases ending in settlement, conviction, or plea agreement. The other axis shows the number of fraud complaints, opened new fraud cases, and cases disposed, respectively.
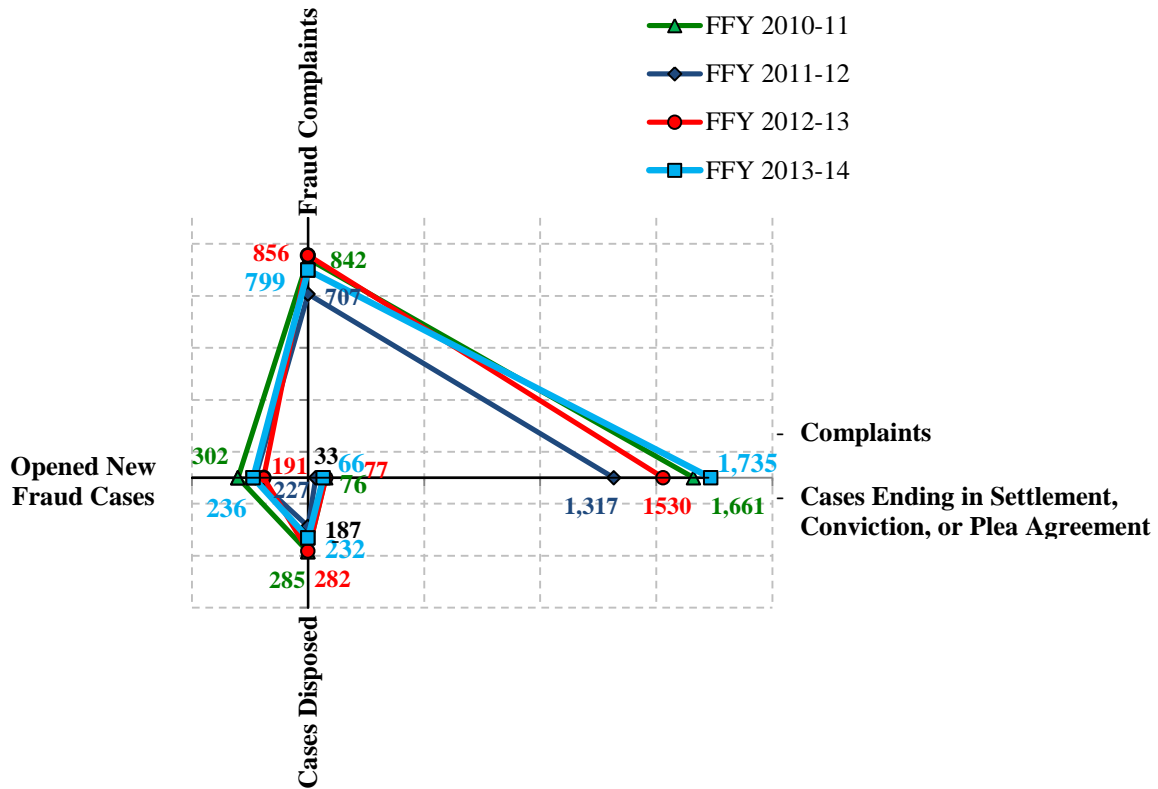
Figure 10: Number of Complaints, Opened New Fraud Cases, Disposition of Cases, and Cases Ending in Settlement, Conviction, or Plea Agreement, MFCU, FFY 2010-11 through FFY 2013-14

For instance in FFY 2010-11, reading the figure counter clockwise, a total of 1,661 complaints were received (first or upper scale on the right hand side of the horizontal axis), 842 fraud complaints were analyzed (top vertical axis), 302 new fraud cases were opened (left hand side of the horizontal axis) (out of 354 cases in total) and 285 fraud cases were disposed (bottom part of the vertical axis). Finally, 76 cases were brought to a settlement, conviction, or plea agreement (bottom scale on the right hand side of the horizontal axis). Consequently, the ratios are: 842/1,661 = 0.507, 302/842 = 0.359, 285/302 = 0.944, and 76/285 = 0.267. Similarly, for FFY 2011-12, a total of 1,317 complaints were processed, 707 complaints were handled, 227 new fraud cases out of 292 cases overall were opened, and 187 cases were brought to a close. In addition, 33 cases ended in a settlement, conviction, or plea agreement. The FFY 2011-12 ratios

are: 707/1,317 = 0.537, 227/707 = 0.321, 187/227 = 0.824, and 33/187 = 0.176. FFY 2012-13 saw 1,530 complaints, of which 856 were fraud complaints. Opened new fraud cases numbered 191, with 330 fraud cases disposed of which 73 cases ended in settlement, conviction, or plea agreement. The respective ratios for FFY 2012-13 therefore are: 856/1530 = 0.559, 191/856 = 0.223, 330/191 = 1.476, and 73/330 = 0.273. Finally, FFY 2013-14 brought 1,735 complaints, of which 799 were fraud complaints. A total of 236 new fraud cases were opened, while a total of 232 were disposed. In addition, 66 cases ended in a settlement, conviction, or plea agreement. Consequently, the ratio's on the clockwise comparison for FFY 2013-14 are: 799/1,735 = 0.461, 236/799 = 0.295, 232/236 = 0.983, and 66/232 = 0.284.

The ratios are recapped in percentages in Table 11. Shading is provided to express the relative preferable outcomes per column (darker is better). The last column of Table 11 indicates the overall efficiency with respect to output, cases ending in settlement, conviction, or plea agreement divided by the complaints 76/1,661 = 0.046, 33/1,317 = 0.025, 73/1,530 = 0.050, and 66/1,735 = 0.038 for the respective FFYs. Finally, the bottom row shows the outcomes of averages linked 51.5 percent times 29.9 percent = 15.4 percent and so on.

Table 11: MFCU Case Statistics per Stage of Process, from Complaints to Cases Ending in Settlement, Conviction, or Plea Agreement, FFY 2010-11 through FFY 2013-14

	Fraud Complaints / Complaints	Opened New Fraud Cases / Fraud Complaints	Cases Disposed / Opened New Fraud Cases	Cases ending in Settlement, Conviction, or Plea Agreement / Cases Disposed	Cases ending in Settlement, Conviction, or Plea Agreement / Complaints
FFY 2010-11	50.7%	35.9%	94.4%	26.7%	4.6%
FFY 2011-12	53.7%	32.1%	82.4%	17.6%	2.5%
FFY 2012-13	55.9%	22.3%	147.6%	27.3%	5.0%
FFY 2013-14	46.1%	29.5%	98.3%	28.5%	3.8%
Averages[18]	51.5%	29.9%	104.3%	24.9%	4.0%
Averages Linked		15.4%	16.1%	4.0%	

In principle, all ratios should be below one since complaints outnumber cases, and not all cases come with an arrest, or a positive outcome in terms of monies recovered. However, data in Figure 10 and Table 11 contain parallel FFY data only, and not successive or causal results from complaint to disposition, or tracking of complaints over the years, from complaint to disposition. Put differently, Figure 10 and Table 11 map the year-to-year activities of the MFCU on all fronts; activities to which time and other resources are allocated, to review, refer, and work with the investigative team, etc.

A similar set-up for the MFCU DMI attributed cases is given in Figure 11, with the recap of ratios (in percentages) in Table 12.
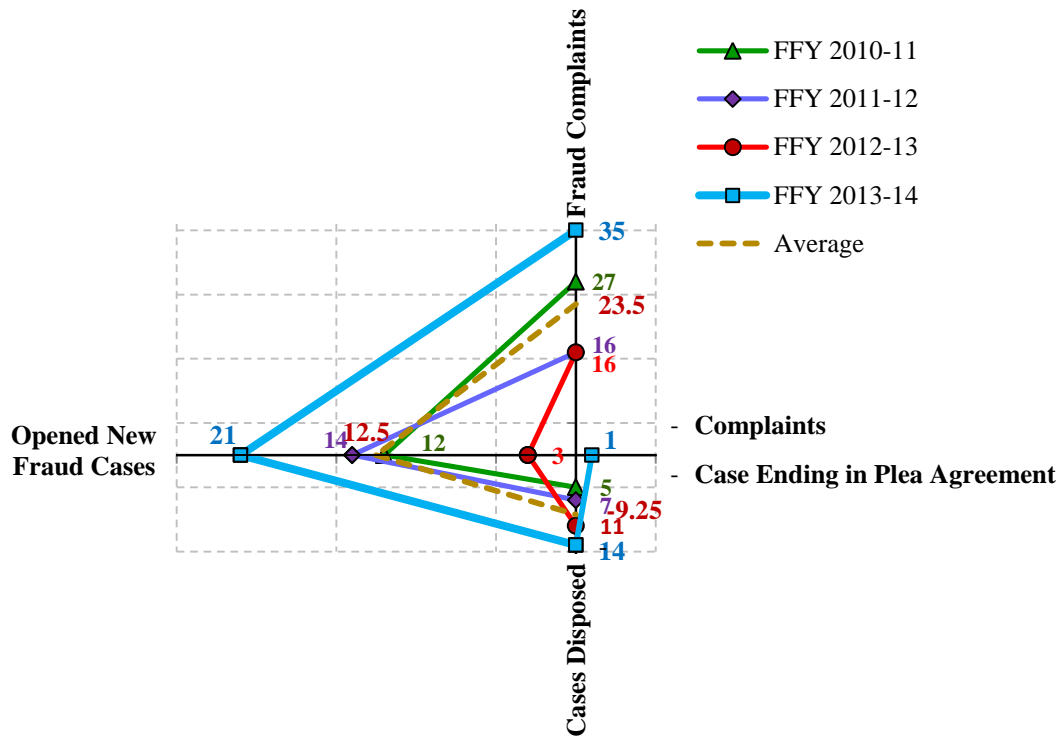
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[18] Geometric averages are used.

Figure 11: Number of Complaints, Opened New Fraud Cases, Disposition of Cases, and Cases Ending in Settlement, Conviction, or Plea Agreement, Attributed to DMI, FFY 2010-11 and FFY 2013-14

From Figure 11 the incidence or ratio of opened new fraud cases divided by fraud complaints changed upwards from FFY 2010-11 to FFY 2011-12 (12/27 = 0.444 and 14/16 = 0.875, respectively) to drop in FFY 2012-13 (3/16 = 0.188). In FFY 2013-14 the incidence ratio was (21/35 = 0.60). All mentioned DMI incidence ratios, but for the FFY 2011-12, were higher than their counterpart MFCU ratios. The annual ratios of cases disposed divided by opened new fraud cases also see higher results; i.e.; fewer cases disposed in FFY 2010-11, FFY 2011-12, and FFY 2013-14 (ratios: 5/12 = 0.417, 7/14 = 0.5, and 14/21 = 0.667), while FFY 2012-13 saw quite an uptick (lower result) in the same ratio (11/3 = 3.67). In addition, in FFY 2013-14, one DMI assignable case was brought to a plea agreement (ratio 1/14 = 0.07). An average is depicted with the dashed line in Figure 12, with the four FFY averages of 23.5 fraud complaints, 12.5 opened

new cases, and 9.25 cases disposed (ratios: 12.5/23.5 = 0.53 and 9.25/12.5 = 0.74). As per Table 11, both average results mentioned are significantly better than their counterpart MFCU ratios. Table 12 provides a recap of the DMI assigned ratios.

Table 12: DMI Assigned Case Statistics per Stage of Process, from Complaints to Cases Ending in Settlement, Conviction, or Plea Agreement, FFY 2010-11 through FFY 2013-14

	Fraud Complaints / Complaints	Opened New Fraud Cases / Fraud Complaints	Cases Disposed / Opened New Fraud Cases	Cases ending in Settlement, Conviction, or Plea Agreement / Cases Disposed	Cases ending in Settlement, Conviction, or Plea Agreement / Fraud Complaints
FFY 2010-11		44.4%	41.7%		
FFY 2011-12		87.5%	50.0%		
FFY 2012-13		18.8%	366.7%		
FFY 2013-14		60.0%	66.7%	7.1%	2.9%
Average[19]		50.6%	101.6%		

On average, the ratio of opened new fraud cases divided by fraud complaints was 50.6 percent and the average ratio of cases disposed divided by opened new fraud cases was 101.6 percent. Comparable average ratios or percentages of the MFCU in total (as per Figure 10 and Table 11) are 29.9 and 104.3 percent, respectively. Both averages of the DMI are significant improvements over the total MFCU ratios in Table 11[20]. In short, the efficiency of the DMI stands out with respect to the MFCU in total.

In using a multivariate regression analyses with the DMI as an added variable, it is possible to derive some explanatory insights, provided the short timeframe of the MEDs-AD Waiver period, from a more dynamic perspective. This brings a hypothetical element to the evaluation, which is to value and compare outputs under different scenarios; with and without the DMI under the MEDs-AD Waiver. For evaluation purposes, the perception is that the MEDs-AD Waiver

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[19] Geometric averages are used.

[20] Taken are the mean and standard deviation on the ratios of MFCU total from Table 11. The comparable two ratios on the DMI from Table 12 have a probability of occurring by chance less than five times out of 100 (designated by convention as $p > .05$) and thus differ significantly, provided the four data points from Table 11 only.

provides an opportunity (e.g.; data mining as an asset or working tool) to the FL AG to increase the efficiency of employment inputs. MFCU and DMI efforts (FFY 2006-07 through FFY 2013-14) are captured, by making, per definition, the sum of the FFP and the FL GR expenditures (sum defined as PGR) dependent[21] on the number of Opened New Fraud Cases (ONFC)[22] and, according to the following format:

$$\textbf{PGR} = \boldsymbol{\alpha} * \textbf{ONFC}^{\boldsymbol{\beta}} * \textbf{FTE}^{\boldsymbol{\gamma}}$$

in which:

PGR = FFP and FL GR means, expenditures only (in real prices of 2014),[23]

ONFC = number of Opened New Fraud Cases

FTE = effective employment in FTEs,[24]

Given the equation, the expenditures (PGR) are seen in direct relation to the number of ONFC and FTEs. The equation allows the DMI to be analyzed in conjunction with the FTEs, with DMI as an added asset to increase the efficiency of employment. Therefore, the equation brings to the forefront, the essence of the evaluation while it allows for sensitivity analyses, i.e.; changing one variable while leaving the others constant (ceteris paribus). The multiple regression analyses on the data points FFY 2006-07 through FFY 2013-14 is run twice, once excluding expenditures,

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[21] In economics, it is standard practice to perceive government expenditures as the value of government production. However, to allow for further analyses, the same equation can be perceived as an identity, making the components interchangeable to, e.g.; ONFC = (PGR / α*FTE$^{\gamma}$) $^{1/\beta}$.

[22] The rationale for using the variable ONFC is that it is the closest variable to potentially retrieve values (the DMI initiative has not yet set a record fit for time series analyses on monies retrieved).

[23] Bureau of Economic Analyses (2014). Annual budget data adjusted with Price Indexes for Gross Domestic Product according to Table 1.1.4. Price Indexes for Gross Domestic Product, Quarterly Data (third quarters only). Data retrieved from http://www.bea.gov, on December 20, 2014.

[24] FTEs are adjusted for time allocated to training. For the MFCU in general, no adjustments were made since this would constitute a linear transformation with no impact on the outcomes of the multiple regression at hand, while for the three data analysts 0.31 FTE, 0.09 FTE, 0.12 FTE, and 0.19 FTE are applied to training purposes for the respective years FFY 2010-11 through FFY 2013-14.

ONFC and FTEs assigned to DMI (suffix 1), and once including the aforementioned DMI components (suffix 2). The multiple regressions for the years yield:[25]

$$\mathbf{PGR_1} = \mathbf{2,057.10} * \mathbf{ONFC_1}^{\mathbf{0.3266}} * \mathbf{FTE_1}^{\mathbf{1.3630}}$$

and

$$\mathbf{PGR_2} = \mathbf{1,272.87} * \mathbf{ONFC_2}^{\mathbf{0.3382}} * \mathbf{FTE_2}^{\mathbf{1.4395}}$$

Figure 12 displays the actual versus the expected PGR, based on the multiple regression equation calculated, for the fiscal years FFY 2006-07 through FFY 2013-14.
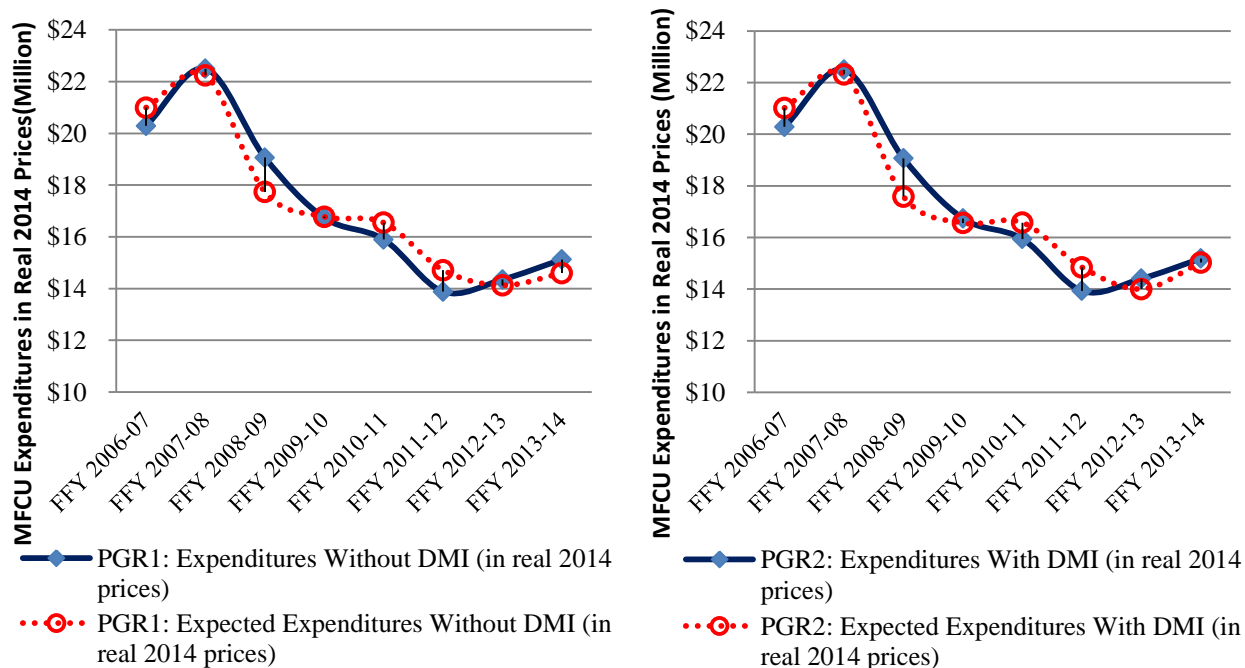

Figure 12: Actual versus Expected MFCU Expenditures in Real 2014 Prices, FFY 2006-07 through FFY 2013-14

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[25]

$PGR_1 = 2,057.10 * ONFC_1^{0.3266} * FTE_1^{1.3630}$				$PGR_2 = 1,272.87 * ONFC_2^{0.3382} * FTE_2^{1.4395}$			
t-Stat	7.2699	2.9003	6.4198	t-Stat	6.1337	2.7122	6.5623
P-value	0.0008	0.0338	0.0014	P-value	0.0017	0.0422	0.0012
With Multiple R=0.9686, R^2=0.9382 and Adj.R^2=0.9135				With Multiple R=0.9644, R^2=0.9301 and Adj.R^2=0.9022			

Given the equation, it is possible to conduct a sensitivity analyses, varying one variable while keeping other variables constant, measuring the impact on ONFC. Figure 13 provides the results of a sensitivity analyses completed with the available data.
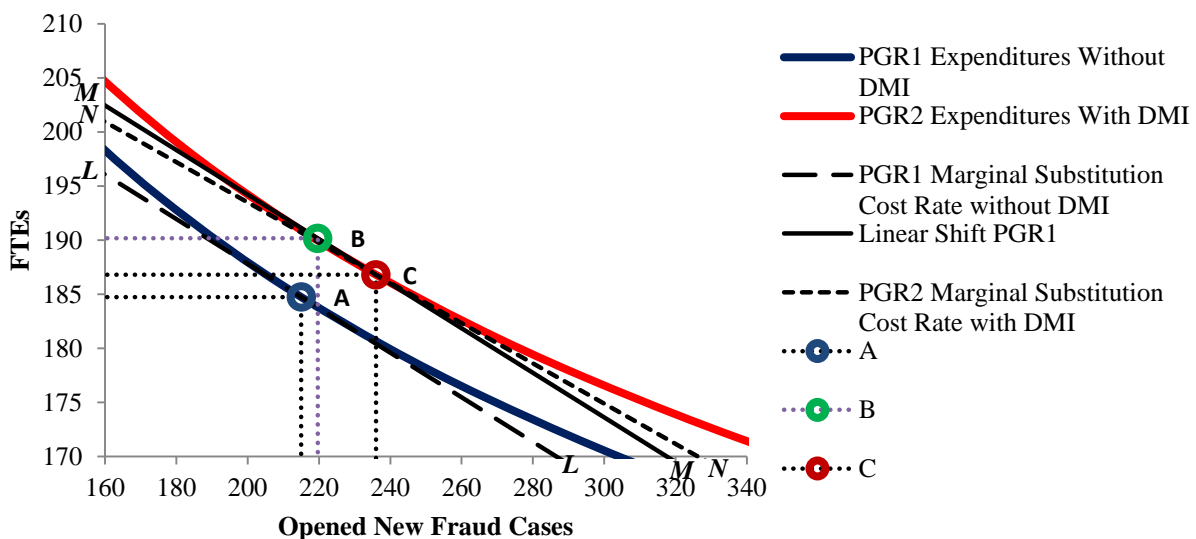

Figure 13: Analyses of FFP and FL GR means, expenditures only, with and without DMI, and FTE Employment on the Number of Expected ONFC, FFY 2013-14

The lines "PGR1 Expenditures Without DMI" and "PGR2 Expenditures With DMI" represent the production isoquants or indifference curves at the expenditure levels $15,125,008 (= PGR1) and $15,182,715 (= PGR2; incl. $57,707 from the DMI), respectively. Both lines are derived from the calculated equations (PGR1 and PGR2) by varying the amounts of FTEs and ONFC in such a way that the resultant PGRs remain at the same level of expenditures. Point A represents the "present level without" the DMI at 184.75 FTEs and 215 ONFC. The slope of the "PGR1 Marginal Substitution Cost Rate Without DMI" (line LL) represents the marginal substitution cost rate between FTE's and ONFC (dFTE1/dONFC1) in the situation without the DMI. In case the added expenditures for the DMI would have been allocated toward the MFCU operations as was the case before the MEDs-AD Waiver, or perceived from a business as usual principle, this would have shifted both the marginal substitution cost line (parallel shift from LL to MM; i.e.;

with the same dFTE1/dONFC1), as well as the indifference to the position at point B. The change between point A and B constitutes a theoretical addition of 5.43 FTEs and 4.64 ONFCs to the MFCU, resulting from $57,707 added expenditures. However, given the addition of the DMI, a different capacity was added i.e.; a substitution is applied, changing the operations of the DMI. This change is represented by a slight rotation of the marginal substitution "cost" rate (change from MM to NN; i.e.; a change to dFTE2/dONFC2) or "Linear shift PGR1" to the new position of "PGR2 Marginal Substitution Cost Rate With DMI", tangent to the "PGR2 Expenditures With DMI" in point C. The change from B to C constitutes 3.37 fewer FTEs and 16.36 more ONFCs. In total, the shift from A to C delivers 2.06 FTE's[26] with 21 ONFC. The two effects are given in Table 13.

Table 13: Expenditure and Substitution Effect of the MEDs-AD Waiver, Transposed on FFY 2013-14

MEDs-AD Waiver Effect		FTEs	ONFC
Expenditure Effect	A to B	5.43	4.64
Substitution Effect	B to C	-3.37	16.36
Total Effect	**A to C**	**2.06**	**21.0**

In short, more MFCU expenditure (to the extent of the DMI expenditures in FFY 2013-14) would in theory, have led to only 4.64 more opened new fraud cases. However, the change in operations within the MFCU, due to the MEDs-AD Waiver, led to 21 more opened new fraud cases overall, with an additional 2.06 FTEs for data miners only (cost-effect and substitution effect inclusive) in FFY 2013-14.

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[26] Mind that the input DMI FTEs were adjusted for time lost due to training i.e. 2.25 FTE minus 0.19 FTE = 2.06 FTE. See footnote 24.

State of Florida
Rick Scott, Governor

Agency for Health Care Administration
Elizabeth Dudek, Secretary

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Mission Statement
Better Healthcare for All Floridians.