AHRQ Grant Final Report

Project Title:
Demonstration of Quality Improvement of Medication Therapy Management Services

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Inclusive Dates of Project:
09/30/2009 – 07/31/2014

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Acknowledgment of Agency Support:
Agency for Healthcare Research and Quality

Grant Award Number:
1R18HS018353

STRUCTURED ABSTRACT

Purpose: The purpose of this study was to improve pharmacist-provided medication therapy management (MTM) by 1) improving the targeting of Medicare Part D beneficiaries for MTM services, 2) enhancing MTM service delivery by pharmacists, and 3) engaging Part D beneficiaries in the medication management process.

Scope: There is a high risk for medication problems among older adults. This study sought to decrease that risk by improving the way MTM is delivered and targeted to specific beneficiaries.

Methods: This demonstration project was designed to implement and evaluate a quality improvement program for an MTM program operated by OutcomesMTM (Outcomes). We evaluated interventions for MTM by randomizing pharmacies and patients into two treatment groups and a control group. Both treatment groups received automated targeted interventions and a patient engagement intervention. One treatment group also received pharmacist training. Improvements were implemented during three periods within the 4-year longitudinal study. To evaluate the effects of the changes, a set of medication use variables was calculated from drug and MTM claims data using a repeated measures approach.

Results: The patient targeting intervention expanded the number of targeting messages sent to pharmacies by the MTM program administrator. The pharmacist training intervention provided online support of MTM delivery but had limited pharmacist uptake. The patient engagement intervention raised the rate of patients obtaining MTM services. These changes in the MTM program didn't translate to differences in medication use compared to the control group. However, there were improvements in all of the medication use variables over the study.

Keywords: medication therapy management, MTM, comprehensive medication review, CMR, targeted intervention, medication adherence

PURPOSE

Our demonstration project set out to improve the value of medication therapy management (MTM) by assessing the effects of specific evidence-based approaches in changing the behaviors of the program administrator, providers, and patients regarding medication use.

The objective of this application was to conduct and evaluate a multifaceted quality improvement program for MTM services provided through a leading MTM service coordinator, OutcomesMTM (Outcomes), formerly Outcomes Pharmaceutical Health Care. We expected to improve the quality of the MTM program by addressing the following three aims:

Specific Aim 1: To improve the targeting of Medicare Part D beneficiaries for MTM services.

Specific Aim 2: To enhance MTM service delivery by pharmacists.

Specific Aim 3: To engage Medicare Part D beneficiaries in the medication management process.

SCOPE

Background

The safety and cost-effectiveness of medication therapy for older Americans is less than optimal. Among the 37 million Medicare Part D beneficiaries, there are prevalent adverse drug events (ADEs), polypharmacy, and growth in costs for medications. One required component of Part D coverage, called medication therapy management (MTM) services, was intended to improve drug therapy for Medicare beneficiaries. However, the effects of most MTM programs have been limited. Recognizing a need for better MTM programs for Medicare beneficiaries, the Center for Medicare and Medicaid Services (CMS) wrote a letter calling for raised quality standards for MTM programs [CMS 2010]. When the study began, there had been little progress in developing enhanced MTM programs.

Context

The University of Iowa research team worked with OutcomesMTM to implement and evaluate the multiple components of their Medicare Part D MTM program within the quality improvement program. Outcomes, a market leader in coordinating pharmacist-provided MTM services, is experienced with the operations of such programs and was able to make the proposed changes. We evaluated a quality improvement program for MTM services that addressed the stated aims.

During the study, various changes were made in the requirements for Part D plans and the MTM programs. We expected to be able to account for the results of these changes through our study design (i.e., use of a control group).

In 2010, CMS required all Medicare beneficiaries eligible for MTM be offered a Comprehensive Medication Review (CMR). Starting in 2014, CMS plans to evaluate Part D plans based, in part, on completion rate of CMRs.

Settings

MTM services were conducted by trained community pharmacists in Outcomes' MTM program network for the two participating plans: one located in Minnesota and the other primarily in Maryland. Pharmacists used a secure, web-based system to communicate with Outcomes. For Specific Aim 3, Part D beneficiaries received an informative letter from the health plan and phone calls from Outcomes staff members.

Participants

This study involved pharmacists and beneficiaries from two Part D clients of Outcomes: Medi-CareFirst BlueCross BlueShield (CareFirst) and Medica. CareFirst is a Medicare Prescription Drug Plan (PDP) located in Medicare Region 5 in Maryland. When our study began in 2010, CareFirst had about 35,000 members covered for face-to-face MTM services through Outcomes' program. CareFirst's MTM program had been offered since January 1, 2006. Medica is a Medicare Advantage Prescription Drug plan (MAPD) located in Medicare Region 19 in Minnesota. Medica had approximately 10,000 members covered for face-to-face MTM services through Outcomes' program. Medica's MTM program has been offered since January 1, 2009. Within these two drug plans, more than 2,500 Outcomes-contracted pharmacies were identified, which we randomized into three study groups.

METHODS

Study Design

We evaluated quality improvement interventions for MTM by randomizing pharmacists and beneficiaries from two Part D clients of Outcomes into two treatment groups and a control group. Improvements were made over a 3-year period, from which we created four 6-month periods for measurements to track the effects of the changes longitudinally. Using drug claims and MTM claims, a set of medication use variables was calculated and used in repeated measures analyses.

Three interventions were implemented corresponding to each of the three specific aims. The three interventions/aims were designed to improve pharmacist-provided MTM by 1) improving Outcomes' Targeted Intervention Program (TIP), 2) providing web-based MTM training for pharmacists, and 3) engaging patients through an outreach tool.

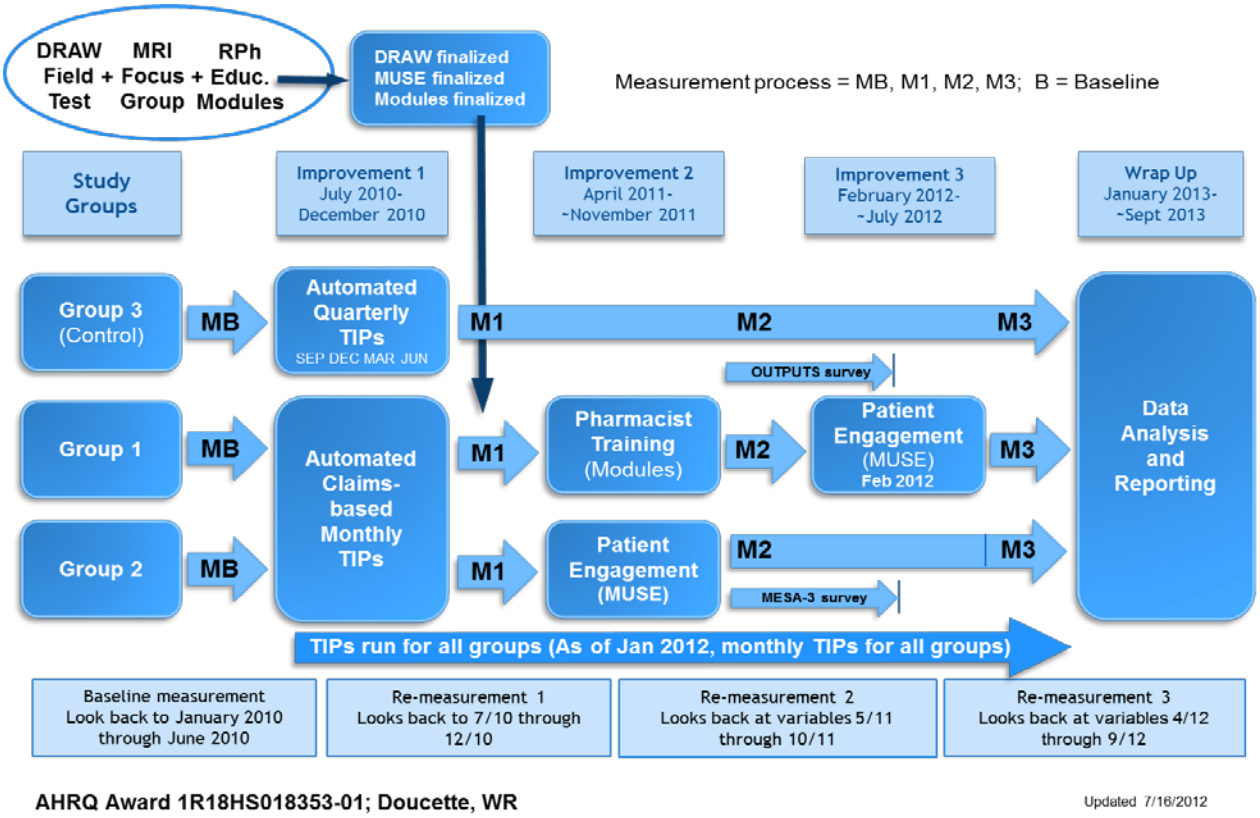
As shown in Figure 1, treatment Group 1 received all three interventions (Automated monthly TIPs [in 2010-2012], pharmacist training [in 2011], and patient engagement [in 2012]). Treatment Group 2 received the automated monthly TIPs (in 2010-2012) and the patient engagement (in 2011). Study Group 3 (the control group) received Outcomes' usual MTM Part D program. Group 3 did not receive the pharmacist training or the patient engagement intervention. However, they did receive the automated TIPs (in 2010-2012), which became part of Outcomes' usual MTM program in 2012.

To create the three study groups, we included all pharmacies that submitted drug claims to the two participating Part D plans (N = 2,524). The goal was to randomize the pharmacies into three study groups that would be reasonably balanced across the three groups on several variables, including the number of trained pharmacists, the number of eligible patients, the number of prescriptions, and the number of MTM claims returned as complete. After sampling, we combined the two sets of randomized pharmacies and assigned 842 to study group 1, 842 to study group 2, and 840 to the control group. Each patient then was put into a study group based on the pharmacy from which he/she obtained the most prescriptions during the first 6 months of 2010. If a patient's primary pharmacy was closed at the time of assignments, the patient was assigned to the pharmacy filling the next higher number of prescriptions.

Data Sources/Collection and Analyses

Data used in this study included Medicare Part D claims and MTM service claims provided by Outcomes. The data were available from January 2010 through December 2012, with the exception of Jan-Feb 2012 data, which were not available at Outcomes.

Figure 1. Diagram of Study Timeline and Activities



Data were also collected from a sample of beneficiaries who were telephoned during the patient engagement intervention.

For each outcome measure, a generalized estimating equation (GEE) model was analyzed, including Drug Plan, Study Period, and Study Group as predictors. These models also included a drug plan by study period interaction, as this term was repeatedly found to be important throughout the study. The dependent variable for the cost analysis was the per-member-per-month total prescription drug cost, averaged over each study period. Analysis was performed with GEE on the log scale, with an unstructured covariance matrix on the (up to) four observations per patient.

Outcomes Variable	**Variable Description**
Proportion of days covered	Proportion of days out of 180 for which the patient had a medication of interest dispensed
Use of high-risk medication	The patient had at least two fills of one of the high-risk medications listed by the CMS star rating measure for high-risk medication use during the 180 day period.
Targeted MTM service	A claim for an MTM service paid to a pharmacy for service provided to a covered beneficiary for a specific MTM service
Monthly medication cost	Mean monthly expenses for prescription medications, as listed in Medicare Part D claims

Intervention (Aim) 1: Automated TIP Program

For its Targeted Intervention Program (TIPs), Outcomes analyzes patients' prescription claims data provided by their clients, identifies any potential drug therapy problems, and then "pushes" targeted intervention program messages, or TIPs, to the patient's pharmacy. As an example, a one-page TIP sheet could be sent to Pharmacy A about a patient who was not filling her statin medication regularly and appeared to be nonadherent. The TIP includes patient and problem information as well as the prescription medication involved. The TIP algorithms can address drug safety, cost issues, and nonadherence.

During the baseline period, the TIPs program analyzed drug claims on a quarterly basis and was labor-intensive. It was a paper-only, manual batch process limited to a few risk categories per quarter. As part of this study, new hardware and server architecture were designed and installed, and new analytical software was developed and tested prior to implementation. In July, 2010, the new, automated, claims-based patient-targeting program, capable of running very detailed risk category algorithms for all beneficiaries every month, was rolled into the Outcomes' online platform.

At the start of Improvement Period 1 (July 2010) and thereafter, Outcomes was running their automated TIPs engine on a monthly basis. Pharmacies in Groups 1 and 2 were being sent TIPs on a monthly basis, and pharmacies in the Control Group were sent their TIPs (generated monthly) on only a quarterly basis. As of January 2012, after a new CMS call letter and the expansion of Star (quality) ratings, there was a healthcare obligation to provide all study groups with TIPs on a monthly basis.

Intervention (Aim) 2: Pharmacist Training Online

Aim 2 related to a quality improvement to provide MTM training specifically directed at the pharmacists in Study Group 1 during Improvement Period 2. We developed and provided online educational videos intended to enhance pharmacists' knowledge for the delivery of MTM services. One video was developed to present a new tool, Tool to Improve Medications in the Elderly via Review (TIMER), along with training on TIMER's use during comprehensive medication reviews (CMRs) for elderly adults. TIMER was intended to support pharmacists when conducting a CMR for older patients. The video was shorter than 10 minutes in order to keep the target audience captive.

A second pharmacist training video focused on best practices and the Drug Adherence Work-up (DRAW) tool. This video also lasted fewer than 10 minutes. Thus, the intervention for Aim 2 was to post two videos onto the pharmacist training website of Outcomes. TIMER had its own video, and we combined the DRAW tool with the 'Best Practices for Better MTM' material for the second video.

The TIMER video was the first to be produced. It was compiled from information our research team had developed during two earlier projects that were completed prior to this study. A Microsoft PowerPoint slide presentation illustrating the features of TIMER, along with notes, was created by the research team. We delivered the PowerPoint slide presentation to Outcomes, which forwarded it to their preferred video production company to create the online educational module. The notes we provided were used as the script for the professional narration of the TIMER module.

The DRAW tool guides pharmacists to ask questions about likely reasons for a patient to not take their medication(s) as directed (e.g., can't afford medication, forgets to take medication, thinks that there are side effects from medication).

DRAW also includes specific advice for the pharmacist to follow for each reason for nonadherence. The DRAW tool was presented in the first segment of the second video.

The content about best practices for integrating MTM into the pharmacy, the second part of the second video, was compiled from information we had gathered from surveys and interviews. For the survey, 19 pharmacists in Outcomes' MTM program provided feedback about MTM service provision, including staffing practices, integrating MTM services into their workflow, and general feedback about providing MTM services. Additionally, three area pharmacists, who are successful MTM providers, were each interviewed face-to-face for approximately 1 hour about how they provide and support MTM services in their practices. The information collected from the surveys and the interviews was incorporated into the "Tools and Tips for Building an MTM Practice" segment of the second video.

During Improvement Period 2, 580 pharmacists in Study Group 1 were sent an email message from Outcomes and asked to watch the training modules and take the post-test. These pharmacists also may have seen and acknowledged an additional pop-up message when they had logged on to Outcomes' website asking them to watch the training modules. Two weeks after the initial message, a follow-up reminder message was sent to encourage participation. The total length of time to view both training modules and their post-tests was expected to total fewer than 20 minutes.

Uptake of the videos was slow from within Study Group 1, so pharmacists who had yet to view the videos were offered a $20 gift card incentive if they successfully took both post-tests. By the end of the treatment period, only 66 of the 580 pharmacists had completed a post-test for both the TIMER and DRAW/Best Practices for Integrating MTM training modules, and five completed just one post-test.

Intervention (Aim) 3: Patient Engagement Process

The intervention for Aim 3 was to administer over the telephone a tool to collect patient information, use the information in an algorithm to estimate their likelihood to benefit from an MTM service, and then tell the patient their likelihood category along with advice to seek an MTM visit. We developed such a tool, called the Medication User Self-Evaluation (MUSE), using responses from a previous survey of Medicare beneficiaries. The seven-item MUSE tool includes questions for patients about their number of medications, number of treating physicians, number of pharmacies from which they get prescriptions, number of hospitalizations in the past 6 months, if they ever forget to take medications or fail to fill a prescription due to cost, and their current number of diagnosed medical conditions. In addition, we conducted four focus groups with older adults about being contacted with a tool such as MUSE. These participants helped us tailor the messaging used in the patient engagement intervention.

For this patient engagement intervention, we called a sample of beneficiaries whow provided responses to the MUSE questions, and then we provided them with advice about their likelihood to benefit from getting a CMR based on their MUSE classification. The sample included all those beneficiaries who had obtained at least 12 prescriptions during a 6-month period (e.g., an average of two medications monthly). There were 2,840 persons identified in 2011 and 3,243 persons identified in 2012 who met these criteria. The MUSE was programmed into an Access database, which was used to enter the patients' responses and to calculate the MUSE categories. Calls were made by Outcomes outreach staff who were experienced in calling patients and who were trained to use the MUSE Access database.

During each 6-month intervention period, Outcomes implemented a batch procedure that selected 200-250 new patients each week who would be mailed a plan-approved letter about medication therapy management services and about a phone call they would get in the next 1-2 weeks to discuss the benefits of a no-cost CMR service opportunity offered to them by their plan. When the beneficiaries completed the MUSE phone questionnaire, they were told their predicted 'likelihood-to-benefit' from a no-cost medication review (CMR) with a pharmacist. Patients with a low likelihood-to-benefit were advised to consider MTM services if his or her health changed or for preventive assistance. Patients with a moderate or high rating were encouraged to schedule a medication review with their pharmacist soon. At the conclusion of the phone contact, call staff provided each beneficiary with information about where they could obtain MTM services and how their health plan encouraged members to take advantage of a no-cost CMR service.

For the MUSE intervention, an additional analysis was conducted to assess its effect on the rate of comprehensive medication reviews over time. Using de-identified claims data, each beneficiary who participated in the MUSE intervention was matched to a single beneficiary from the same time period (2011, 2012) from the control group. Using information on prescription fills and demographics from OutcomesMTM, an exact match was required for plan, number of unique prescriptions, pharmacy training status, and gender; age was matched to within 5 years. This process used a greedy algorithm and was conducted for each time period. The outcome variable was whether or not the beneficiary received a CMR in the 6 months following the index date. Generalized Estimating Equations (GEEs) were used to model CMR rates over time and between those who did/did not receive the MUSE intervention. The logit link and binomial distribution for the outcome were assumed.

Measures

The drug claims-based measures were developed and tested by the Pharmacy Quality Alliance (PQA) [NCQA Measure Development Report 2007]. While the study was in process, several of these measures were added to Medicare drug plan quality ratings (i.e., Star ratings), highlighting the usefulness of these measures in tracking the effects of MTM programs. Variables that were tracked included number of MTM services provided; claims-based adherence measures (proportion of days covered [PDC] for beta blockers, ACE inhibitors/ARBs, statins, and oral diabetes medications; and number of high-risk medications [HRMs]). The drug claim-based measures reflect medication use related to adherence (i.e., PDC measures) and safety (i.e., HRM use). In addition to the quality indicators, we also tracked the average monthly drug cost per beneficiary.

Limitations

A limitation of this study is that only one MTM program was evaluated. Though OutcomesMTM covers MTM services for several million people, they have a relatively consistent MTM program across their clients. Although this was helpful in designing the interventions, it does limit the generalizability of these findings to other MTM programs.

Another limitation is that, during the study period, the regulations from CMS for Medicare Part D plans and associated MTM programs changed with new policies. For example, during the study, CMS began to require that all MTM programs offer CMRs to eligible Part D beneficiaries. In addition, CMS implemented a Medicare Part D plan quality rating system (i.e., Star ratings). Because some of the quality indicators related to medication use, the Part D MTM programs adjusted their focus onto these indicators.

Although we included some of the Star rating indicators as our outcomes variables, the change of focus made it very difficult to detect the effects of our interventions. That is, environmental effects moved all study groups in similar directions, which resulted in little difference between treatment groups and the control group.

RESULTS

Principal Findings

For the PDCs, a similar pattern was found across the GEE models for each of the drug classes (Table 1). In each case, there was no significant difference between the study groups. However, for each drug class, a significant positive result for time period showed that the PDC values increased over time. That means that adherence rates were raised during the study for all of the drug categories analyzed. A significant interaction between time period x plan consistently showed that the trend over time differed significantly between the two plans.

The use of high-risk medications by the beneficiaries of the two drug plans generally decreased over time. Again, the study group coefficients were not significant, indicating no difference between groups over time (Table 2). Once again, there was significant improvement over time in all groups, as evidenced by a significant negative coefficient for time period. Also, there was a significant coefficient for a time period x plan interaction. This shows that the downward trend for HRM use differed significantly across the two drug plans.

As shown in Table 3, there were significant study group effects on MTM claims: Study Group 2 showed a significantly lower level of MTM Targeted Intervention claims compared to the Control Group. Also, Plan 1 had a significantly greater level of the Targeted Interventions compared to Plan 2. Finally, there was a significant positive coefficient for time period, which shows that the Targeted Interventions were increasing across all three study groups during the study. No interactions were significant for MTM claims.

Monthly medication costs were significantly lower in Study Group 2 than Study Group 3 (Control Group) (Table 4). Mean monthly medication costs decreased significantly over the study period and the time trend differed by drug plan.

For the MUSE-CMR analysis, excluding those who opted out or could not be reached, the final sample size of those who participated in the MUSE intervention was 1,015, of which 1,007 were successfully matched to a control beneficiary. Based on the final model, the estimated odds of having a CMR among those who received the MUSE intervention were double that of their corresponding control beneficiaries ($p = 0.0048$) across both study years. Because the yearly odds were not significantly different, the modeled pooled estimate of the odds ratio of MUSE intervention over control was 2.06.

TABLE 1. Proportion of Days Covered GEE Results					
Variable	**Beta Blockers**	**ACEIs/ARBs**	**CCBs**	**Statins**	**Oral Diabetes**
Intercept	2.15**	2.13**	2.32**	1.98**	2.20**
Plan 1	0.14	0.16	-0.14	0.17*	0.13
Plan 2	Baseline	Baseline	Baseline	Baseline	Baseline
Study Group 1	-0.086	0.058	0.11	0.0076	-0.12
Study Group 2	-0.091	-0.045	0.094	-0.042	0.046
Study Group 3	Baseline	Baseline	Baseline	Baseline	Baseline
Study period	0.11**	0.17**	0.11**	0.13**	0.062
Study Period by Plan 1	-0.16**	-021**	-0.14**	-0.15**	-0.18**
Study Period by Plan 2	Baseline	Baseline	Baseline	Baseline	Baseline

* Significant at 0.05. ** Significant at 0.01.

TABLE 2. High-Risk Medications GEE Results		
Variable	**Estimate**	**Z**
Intercept	-2.61**	-63.44
Plan 1	0.45**	8.03
Plan 2	Baseline	-
Study Group 1	0.078	1.74
Study Group 2	0.024	0.54
Study Group 3	Baseline	-
Study period	-0.096**	-8.63
Study Period by Plan 1	0.042*	2.25
Study Period by Plan 2	Baseline	-

* Significant at 0.05. ** Significant at 0.01.

TABLE 3. Targeted MTM Intervention GEE Results		
Variable	**Estimate**	**Z**
Intercept	-7.92**	-23.77
Plan 1	1.90**	4.45
Plan 2	Baseline	-
Study Group 1	-0.20	-1.12
Study Group 2	-0.56**	-3.08
Study Group 3	Baseline	-
Study period	0.48**	4.81
Study Period by Plan 1	-0.22	-1.51
Study Period by Plan 2	Baseline	-

* Significant at 0.05. ** Significant at 0.01.

TABLE 4. Monthly Medication Cost GEE Results		
Variable	**Estimate**	**Z**
Intercept	5.26**	491.95
Plan 1	0.002	0.1
Plan 2	Baseline	-
Study Group 1	-0.019	-1.41
Study Group 2	-0.028*	-2.12
Study Group 3	Baseline	-
Study period	-052**	-23.11
Study Period by Plan 1	0.069**	12.85
Study Period by Plan 2	Baseline	-

* Significant at 0.05. ** Significant at 0.01.

Outcomes

Each of the medication use variables improved during the time of the study. All the medication adherence measures increased over time. One interpretation of this could be that the MTM program was having a desired effect on patients' ability/willingness to take their medications as directed. The MTM program that was studied does focus some of the Targeted Interventions on medication adherence. This focus likely increased overall, as three PDC measures were incorporated into Medicare drug plan quality ratings reported by CMS. We believe that the greater attention on MTM services by the drug plans has raised the volume and quality of MTM services. Similar improvements were seen over time in the decreased use of high-risk medications and in reduced medication costs in one of the drug plans.

The Medication User Self Evaluation (MUSE) tool was associated with a higher rate of CMRs. It appears that the contact with patients can help engage them in a medication management process. The MUSE intervention informed the beneficiaries about the free CMR service and provided information about their likely benefit from a CMR. Future work with such a patient engagement activity could help us better understand how to stimulate needful patients to utilize MTM services such as CMRs.

Discussion

Overall, the interventions studied here had limited detectable effect on the medication use variables. This could be due to difficulty in detecting differences across the study groups – perhaps due to weak effects of the interventions and/or strong and pervasive environmental effects occurring at the time of the study that drove improvements in all of the study groups. Such environmental effects could make it difficult to identify differences in effects across the groups. Medicare Part D, including MTM services, has been a dynamic area, as CMS has made changes almost annually in program requirements. These changes make it challenging to conduct research, such as what was done here over multiple years.

Working with Outcomes in this environment required some trade-offs. Though they were sensitive to the needs of the study design and methods, they also had to adjust their MTM program to meet CMS requirements and client expectations. One example was that they expanded the first intervention of the TIP automation to all study groups at the start of 2012. This was in response to a request by their client drug plans who participated in this study.

The clients' concerns were to improve their Star (quality) ratings, which involved the PDC measures. Outcomes' TIP program included TIPs targeting improved medication adherence for the three PDC measures in the drug plan Star ratings. Thus, the clients wanted these TIPs to be sent frequently, not quarterly as initially planned.

The fidelity of the pharmacist training intervention was not optimal, as it had low uptake by Outcomes' pharmacists serving the beneficiaries in the study. We think the intervention was helpful at informing the pharmacists who viewed it, but only a small proportion of them completed a self-evaluation that indicated that they had viewed the videos. The mechanisms available through Outcomes to stimulate pharmacist participation in the online training (e.g., email, incentives) were not effective at reaching fuller participation. Thus, the effect of this intervention likely was not fully felt on the medication use outcome measures.

In addition, though the MUSE patient engagement intervention affected CMR use, there was some difficulty in delivering it, too. Only about 25% of the targeted Medicare beneficiaries actually participated in the MUSE call. The reasons for the low rate include out-of-service telephone numbers, inability to reach targeted beneficiaries, and patient refusal to participate in the MUSE call. The presence of a working phone number for the Medicare drug plan and Outcomes would better support the Part D and associated MTM programs.

Another issue that emerged was limited awareness and demand by Medicare beneficiaries for MTM services. Early in the study, we conducted some focus groups with older adults about MTM services and their likely response to a tool like the MUSE. They stated little awareness of MTM services and thought that they were the same as counseling by a pharmacist at the time of dispensing. Some focus group participants expressed limited interest in MTM services, but most saw value from participating in such services. They expressed that their physicians or pharmacists already were helping them with their medications. Also, during the telephone calls for the patient engagement (MUSE) intervention, the outreach personnel reported that many of the Medicare beneficiaries with whom they spoke did not know about the MTM program/services. One intention of the patient engagement intervention was to help the beneficiaries learn about the MTM services as well as to stimulate those in need to check into receiving such services. Although our patient engagement intervention did show a significant association with more CMRs, there is more work to be done in this area.

We need to better inform eligible Medicare Part D beneficiaries about MTM services. Targeted interventions, such as the one we studied (i.e., MUSE), could be used, though mass communication approaches would provide an efficient way to reach many beneficiaries. Some combination of these approaches could be effective at raising Medicare beneficiaries' awareness of MTM services and their role in safe and effective medication therapy. Study of active promotion of MTM programs, perhaps by CMS or specific Part D plans, would improve our understanding of how to activate eligible patients to participate in and benefit from MTM services.

Conclusions

Overall, medication use improved during the study. However, the interventions' effects were mixed. The most potentially powerful of the three interventions, the automated TIP intervention, was tested for less than the intended time due to demand for the TIP program by Outcomes' clients. However, we did see an increase in the number of TIPs over the study period. The uptake of the online pharmacist training was low, which limited its effect. Although the patient engagement (MUSE) intervention was delivered to a smaller group than planned, we did find a significant increase in CMRs among those who received the MUSE intervention.

We believe that the dynamic nature of Medicare Part D and MTM programs created environmental effects that influenced all the study groups, making it difficult to detect differences across the study groups.

Significance

The MTM partner in this study, OutcomesMTM, is a national leader in MTM programs. During this study they automated their TIP program that analyzes drug claims data to target patients for MTM services. This type of claims-based targeting of high-risk patients has become state of the art for health services such as MTM. During this study, Outcomes refined its TIP program to become more effective and adjusted its focus to be in line with Medicare drug plan quality rating indicators. As industry leaders, the improvements made by OutcomesMTM in its TIP program advanced the use of claims-based targeting, which can bring efficiency to MTM programs.

The patient engagement intervention (MUSE tool) provides a promising approach for activating needful patients to seek MTM services. Because MTM services are relatively new, patient demand for them has been weak. We believe that targeted patient outreach, such as the telephone calls incorporating the MUSE tool, could be used with a mass communication approach to better inform and stimulate beneficiaries to seek MTM services when needed. At this point, most Medicare beneficiaries do not see a need for MTM services and often do not know what they are. Future research could be done to develop and evaluate effective and efficient programs to properly engage patients in MTM services.

Implications

Implications for policymakers include more efforts to inform beneficiaries about MTM services. CMS only recently included information about MTM services in the materials available to Medicare Part D beneficiaries. As we've discussed, efforts could be made by CMS, the Part D plans, and MTM providers to inform beneficiaries about the need for and benefits from participating in MTM services.

For MTM programs, this study showed that automated analyses of drug claims data can be used to improve the targeting of MTM services. Approaches, such as Outcomes' TIPs, have become the standard for MTM programs. Such targeting brings efficiency to MTM programs, which could support further uptake of those services. These approaches should not replace patient and provider identification of patient need for MTM services, but they can serve as an important component for the best MTM programs.

An implication for researchers is that a dynamic area, such as Medicare Part D, creates challenges in studying the effects of MTM programs. We designed this study to make changes in an MTM program to be able to assess the effects on study groups over multiple years. However, due to changes in the Part D program and competitive pressures, changes occurred in the MTM program outside of the study design, creating strong system-wide improvements. One idea would be to use a shorter study period in making interventions and in measuring effects. For example, we used drug claims data in 6-month periods to measure medication use. Perhaps patient medication use logs could be used to track more rapid effects of MTM services. Future demonstration studies of Medicare Part D could incorporate shortened time frames.

AHRQ Priority Populations

Because this study focused on Medicare beneficiaries, most of the patients who were studied were **older adults**. Older adults typically use multiple medications to manage multiple health conditions. A key finding is that the medication use variables that we tracked in this study improved over time. One interpretation of this finding is that the MTM program appears to have benefited the older patients.

Also, many of the patients studied here had **chronic conditions** being treated with medications. The scope of this study did not include collecting clinical data, so we do not know how the MTM program affected control of their conditions. However, we did see that their medication use improved, which we would expect to be associated with better outcomes. Further research could more directly address the effects of MTM services on patient outcomes.

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