

Impact of First Fill Intervention on High-risk Medication Usage in a One Million Member Medicare Population

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Background

- High-risk medications (HRM) have greater risk for adverse events among the elderly and safer alternatives are available.¹ The use of HRMs among the elderly is a Centers for Medicare & Medicaid Services (CMS) Medicare quality of care Star metric with the 2015 metrics for a 3 Star of greater than 11 percent to less than or equal to 14 percent, a 4 Star rate of greater than 6 percent to less than or equal to 11 percent and 5 Star of less than or equal to 6 percent.²
- Medicare insurers' quality is measured via the CMS Star metrics. Since HRM use is a CMS Star metric, Medicare insurers work to lower HRM use to improve their HRM Star score.
- The HRM first fill intervention is an outreach program intended to prevent Medicare members from obtaining a second HRM fill in the calendar year.
- In 2015, members with their first HRM were identified and a prescriber letter was sent. A member letter was also sent to a subset of the population.
- The HRM identification was based on the CMS Star Quality Ratings HRM list and methods.³
- Little is known of the impact insurers' interventions may be having on decreasing HRM use.

Objective

- To assess whether the HRM first fill intervention, a prescriber letter with or without a member letter, was associated with a lower HRM Star percentage from 2014 to 2015 versus a concurrent control group that did not implement the outreach program.

Methods

- The study examined the CMS HRM Star percentage measure for contracts that participated in the HRM intervention compared to contracts that did not participate in the HRM intervention.

Study Design

- Prime Therapeutics (Prime) used administrative pharmacy claims and membership eligibility data for 26 contracts in the Prime database to calculate the CMS HRM Star percentages for the year 2014 and the year 2015.
- Per the CMS defined HRM list, there were 58 drug or drug classes in 2015 that we used to evaluate the CMS HRM Star percentages.
- We conducted the analysis on the contract level instead of the member level because a member level analysis would have required that each member was in both 2014 and 2015.
- The control group consisted of five contracts that did not participate in the HRM first fill intervention. The intervention group consisted of 21 contracts with seven contracts involved in the prescriber plus member intervention and 14 contracts involved in the prescriber-only letter intervention. We excluded contracts from the analysis with less than 200 yearly enrolled members.

Outcome

- CMS HRM Star percentage in 2014 and 2015

→ The Star percentage was calculated by determining the number of members in the contract's population who had at least two HRM fills of the same drug or drug class during the calendar year (numerator) from the total number of members in the contract's population (denominator).

→ Member enrollment by month was also considered in the measure based on CMS HRM criteria.

Statistical Methods

- SAS 9.4 (SAS Institute Inc., Cary, NC) was used for all analyses.
- A difference-in-difference statistical analysis was used for the comparison between the intervention and control groups.³
- Since the contract enrollment varied substantially, we weighed the statistical model by the contract denominator to appropriately estimate the impact of each contract.
- We fit a generalized estimating equation (GEE) regression model to estimate the HRM difference-in-difference.⁴
- The model adjusted for intervention, time, plan type and percentage female in the contract population.
- The model weighted by contract denominator and had an exchangeable correlation structure.⁵
- A statistically significant (p-value less than 0.05) interaction between the HRM Star percentage and the pre-period (2014) versus post-period (2015) in the model determined whether there was a difference-in-difference, which indicated the intervention was associated with a lower HRM user rate.

Prescriber Plus Member Letter Versus Prescriber Letter Only Analysis

- In addition to the contract level study, we assessed the impact of the two interventions, the prescriber plus member letter compared to the prescriber only letter, on the percentage of HRM criteria met in 2015 at the member level.
- Weekly member files in the HRM first fill program were identified for each quarter in 2015.
- Plans that sent only the prescriber letter were categorized as the prescriber letter only intervention and plans that sent both the prescriber letter and the member letter were considered the prescriber plus member letter intervention.
- The analysis was restricted to continuously enrolled members in 2015. All 2015 HRM pharmacy claims were added to the cohort. We then determined the percentage of the cohort that met HRM criteria (i.e., had a second claim for the drug or drug class during 2015).
- Multivariate logistic regression was used to estimate the association between the prescriber letter only intervention group compared to the prescriber plus member letter intervention group and the percentage of members who met the end of the year 2015 HRM criteria adjusting for gender, age, plan type and census ZIP Code derived median income, race and education.

Results

- The analysis used 26 Medicare contracts comprised of 979,060 yearly enrolled members in 2014 and 1,184,355 in 2015 (26 contracts at two time periods, N=52).
- There were 14 contracts that were Medicare Advantage (MAPD) and seven contracts that were from prescription drug plan (PDP). The percentage female in the contracts ranged from 50.1 percent to 73.8 percent.
- The contract populations ranged in size from 481 to 385,993 yearly enrolled members.
- Overall in 2015, the top five drug or drug class opportunities for the HRM first fill program were from zolpidem, cyclobenzaprine, estrogens, nitrofurantoin and amitriptyline (Table 1). The five drug categories comprised nearly 70 percent of the opportunities for both the intervention group (69.8 percent) and the control group (68.9 percent).

Unadjusted Pre-period vs. Post-period, Difference-in-Difference (Figure 1)

- The intervention group HRM Star percentage decreased from 9.9 percent in 2014 to 7.1 percent in 2015. The control group decreased from 5.6 percent to 4.1 percent.
- The intervention group decreased an unadjusted 1.3 percentage points more than the control group from 2014 to 2015.

Generalized Estimating Equation (GEE) – Adjusted Model (Table 2)

- A statistically significant, GEE adjusted 1 percentage point, -0.01 (95 percent confidence interval: -0.02, less than 0.00); p=0.03, average decrease in overall HRM Star percentage was found among contracts with an HRM first fill intervention compared to the control population over time.
- For the model, the total sum of the weights was 2,163,414. There were 26 clustered levels from the repeated measures. The model had a QIC of 65.24, and QICu of 58.00 which had the best fit compared to other correlation structures.

Prescriber Plus Member Letter Versus Prescriber Only Letter Analysis (Table 3)

- Based on the above results, we conducted an analysis to determine whether there was a difference between the two types of first fill intervention. We found 125,917 HRM first fill intervention opportunities in 2015 for which letters were sent. Out of the 125,917 opportunities, 57,862 (46.0 percent) were identified from the prescriber letter only intervention group and 68,055 (54.0 percent) were identified from the prescriber plus member letter intervention group.
- The percentage of opportunities from the prescriber only letter intervention who went on to have a second HRM medication claim, meeting the 2015 HRM criteria was 46.4 percent compared to the combined prescriber plus member letter intervention, which was 47.6 percent. After adjusting for covariates and plan type, there was no significant difference between the two types of letter interventions, odds ratio: 0.99 (95 percent CI: 0.97 – 1.02).

Limitations

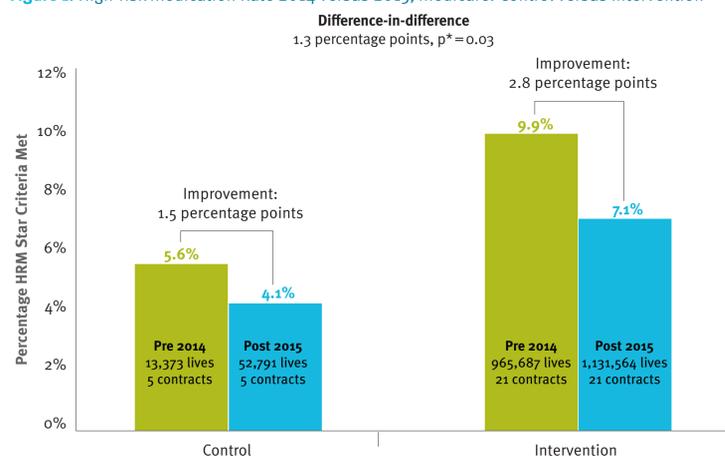
- Other HRM discontinuation programs that occurred during these time periods may have impacted the results.
- In the difference-in-difference analysis, we did not adjust for plans by percentage of low-income subsidies within the contracts. However, we did adjust for plan type (Medicare Advantage versus PDP only) which can account for socioeconomic differences in the contracts.
- Although study limitations exist, most contracts had an overall HRM percentage of less than 10 percent, a 1 percentage point additional difference-in-difference is large and may be critical in improving Star ratings.

Table 1. Distribution of Top Five Drugs/Drug Categories in 2015 for Intervention and Comparison Groups*

Drug	Intervention (%), n=125,917	Control (%), n=3,929
Zolpidem	31.0%	30.8%
Cyclobenzaprine	12.9%	18.8%
Estrogens	11.2%	9.8%
Nitrofurantoin	8.3%	3.2%
Amitriptyline	6.4%	6.3%
Total	69.8%	68.9%

* total members: 1,184,355 in 26 contracts

Figure 1. High-risk Medication Rate 2014 versus 2015, Medicare: Control versus Intervention



Intervention was a letter to prescriber with or without a member letter
*Statistically significant, Difference-in-Difference
HRM = High-risk Medications, Pre=Before First Fill, Post=After First Fill

Table 2. Parameter Estimates for High-risk Medication Star Percentage, Examination of the Difference-in-Difference between the Intervention Compared to Controls from 2014 to 2015 – General Estimating Equation (GEE) Analyses

	GEE Unadjusted	P-Value	GEE* Adjusted	P-Value
N=52			N=52	
Estimate (95% CI)			Estimate (95% CI)	
Intervention x Time (Difference-in-Difference)				
First Fill Intervention	-0.009 (-0.016, -0.002)	0.02	-0.008 (-0.015, -0.001)	0.03
Controls	Reference		Reference	
Intervention				
First Fill Intervention	0.036 (0.019, 0.053)	<0.01	0.027 (0.007, 0.048)	<0.01
Controls	Reference		Reference	
Time	-0.019 (-0.023, -0.015)	<0.01	-0.020 (-0.023, -0.017)	<0.01
Plan Type				
MAPD			-0.008 (-0.024, 0.008)	0.33
PDP			Reference	
Percentage Female				
			0.104 (-0.063, 0.271)	0.22

Estimated Difference-in-Difference: 1.0%

The analysis used 26 Medicare contracts comprised of 979,060 yearly enrolled members in 2014 and 1,184,355 in 2015 (26 contracts at two time periods, N=52).
CI = confidence interval, MAPD = Medicare Advantage Plan, PDP = prescription drug plan
*Adjusting for plan type and percentage female in contract populations
Sum of Weights: 2,163,414
A bold P-Value signifies the intervention's significance

Table 3. Adjusted Odds of Not Meeting High-risk Medication (HRM) 2015 Criteria (Not having an additional HRM claim for drug/drug class)

	Adjusted Odds of Not Meeting HRM Criteria (All HRM) OR (95%CI)*	Adjusted Odds of Not Meeting HRM Criteria (All HRM) OR (95%CI)†
N = 125,917		
Intervention	Reference	Reference
Prescriber letter	Reference	Reference
Prescriber plus member letter	0.95 (0.93 – 0.97)	0.99 (0.97 – 1.02)
Gender		
Male	Reference	Reference
Female	0.71 (0.70 – 0.73)	0.71 (0.70 – 0.73)
Age		
< 69 yrs	Reference	Reference
≥ 69 – < 73 yrs	1.00 (0.97 – 1.03)	1.00 (0.97 – 1.03)
≥ 73 – < 78 yrs	0.98 (0.95 – 1.01)	0.99 (0.96 – 1.02)
≥ 78+ yrs	0.99 (0.96 – 1.03)	1.01 (0.97 – 1.04)
Proportion of White		
< 70.8%	Reference	Reference
≥ 70.8% – < 82.0%	0.97 (0.94 – 1.00)	0.97 (0.94 – 1.00)
≥ 82.0% – < 90.5%	0.98 (0.95 – 1.01)	0.98 (0.94 – 1.01)
≥ 90.5%	0.96 (0.93 – 0.99)	0.96 (0.93 – 0.99)
Proportion with high school degree		
< 81%	Reference	Reference
≥ 81.0% – < 87.6%	0.97 (0.93 – 1.00)	0.97 (0.94 – 1.00)
≥ 87.6% – < 93.0%	0.95 (0.92 – 0.99)	0.96 (0.92 – 1.00)
≥ 93.0%	0.96 (0.92 – 1.01)	0.97 (0.92 – 1.02)
Median household income		
< \$40,494	Reference	Reference
≥ \$40,494 – < \$50,462	1.04 (1.00 – 1.07)	1.04 (1.00 – 1.07)
≥ \$50,462% – < \$65,662	1.09 (1.05 – 1.13)	1.09 (1.05 – 1.14)
≥ \$65,662	1.21 (1.16 – 1.27)	1.22 (1.16 – 1.28)
Plan type		Reference
MAPD		Reference
PDP		0.90 (0.88 – 0.93)

OR: odds ratio, CI = confidence interval, MAPD = Medicare Advantage Plan, PDP = prescription drug plan
Total members: 1,184,355 in 26 contracts for 2015
*Without plan type adjustment
†With plan type adjustment

Conclusions

- We found there was a statistically significant additional 1 percentage point difference-in-difference impact associated with the HRM letter intervention compared to the no intervention group from 2014 to 2015. For contracts that were within 1 percentage point of an HRM Star rating score, the prescriber letter with or without member letter intervention may have accounted for HRM Star score improvement.
- For example, if a contract that implemented the intervention in 2015 had an HRM percentage of 10.5 percent, the contract would have received a 4 Star HRM score. But without the intervention, the contract may have had an HRM percentage of 11.5 percent and received a lower 3 Star HRM score.
- The top five HRMs were zolpidem, cyclobenzaprine, estrogens, nitrofurantoin and amitriptyline and accounted for almost 70 percent of the HRM drug use. Future HRM medication intervention programs should focus on these top five HRMs.
- There was not a statistically different impact on the HRM star percentage between the prescriber plus member letter versus the prescriber only letter. This result demonstrates that both the prescriber plus member letter and the prescriber only letter had a similarly associated impact on the improvement of the HRM percentage score.

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