

Declaration

Authors have declared no conflicts of interest

Evaluation of Cost and Health Utilization Outcomes of Medicare Beneficiaries Enrolled in a Medication Synchronization Program

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What is Medication Synchronization?

Initial

Patient identification

Patients on multiple medications
Patients with chronic diseases where strict adherence is critical (eg. HIV, transplant)

Align Refills

Pharmacy staff will perform a short fill (less than a typical 30- or 90-day supply) or long fill (more than a typical supply) to align with other prescriptions
Chosen date becomes patient's pick-up date

Medication Review and Patient Assessment

Pharmacist performs a medication review and patient assessment and creates a plan to resolve them, alongside the patient.
Offers medication education, counseling, and refill assistance

Recurring

Appointment and Medication preparation

Pharmacist performs a comprehensive review each month, prepares medication, orders any drugs not in stock
Contact's patient to remind of upcoming pickup date

Pre-appointment call

Pharmacy staff reviews the order, contacts patient about their fill.
Identifies changes in drug therapy or hospitalizations

Patient appointment

Patient visits the pharmacy to pick up medications
Pharmacist may engage in medication management or other services

Rationale and Objectives

Rationale

- The current literature lacks studies that evaluate healthcare outcomes, using patient claims data among med-sync populations
- Limited retrospective studies on national level

Objective

- To evaluate the effect of med-sync on outpatient, inpatient, emergency, pharmacy and total healthcare utilization and costs in a nationwide sample of Medicare beneficiaries.

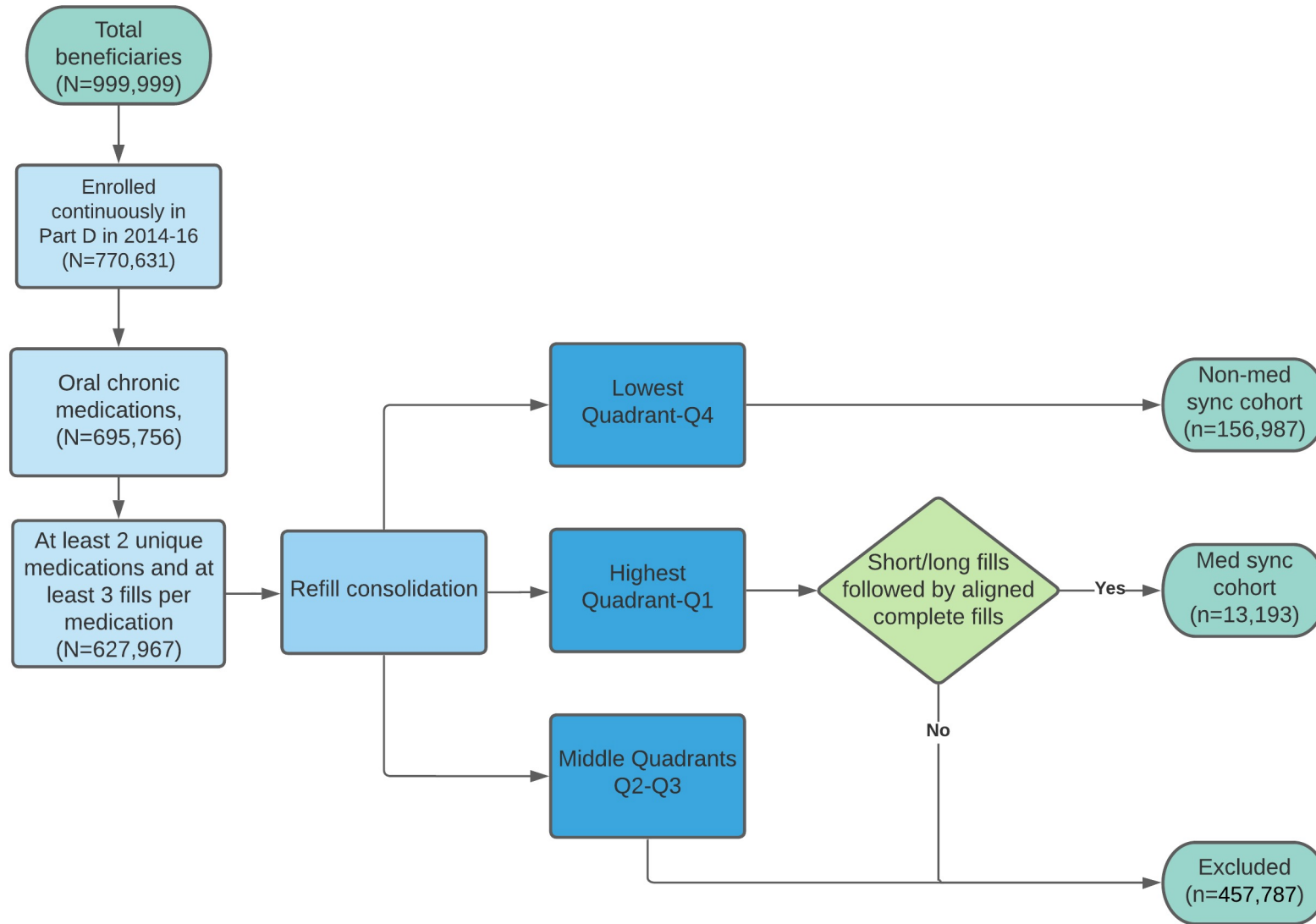
Hypothesis

- Medicare Part D beneficiaries newly enrolled in a medication synchronization program would have a lower healthcare utilization when compared to a matched cohort of beneficiaries not enrolled in a medication synchronization program
- Medicare Part D beneficiaries newly enrolled in a medication synchronization program would have a lower mean total healthcare cost when compared to a matched cohort of beneficiaries not enrolled in a medication synchronization program

Research Design

- Retrospective cohort study of Medicare claims data.
- Identified pharmacies providing Appointment-based model (ABM) of med-sync from a prior study on medication synchronization.
- Non-random sample of 1 million Medicare beneficiaries receiving medications from the identified pharmacies and having was obtained from Research Data Assistance Center (ResDAC).
- Data included Part A, B, and D Medicare utilization data from 2014 -16.
- Includes patients both enrolled and not enrolled in med-sync from these pharmacies.

Research Design



Methodology

Anderson's health utilization framework

- Predisposing factors
- Enabling factors
- Need factors

Measures

- Pre-enrollment (12-months prior) characteristics used for propensity scoring
- Independent variables - age, race, type of Medicare eligibility, region, Elixhauser comorbidity conditions
- Outcome variables - healthcare costs and utilization (total, outpatient, inpatient, emergency, pharmacy)

Propensity scoring

- Logistic regression was used to generate a propensity score using age, race, type of Medicare eligibility, region, Elixhauser comorbidity conditions as covariates
- Discounting was performed for 2014 and 2015 costs to adjust for 2016 based on Consumer Price Index
- Logarithmic transformation of costs were used for comparison of DID (difference-in-difference) cost analyses
- DID analyses was performed on health utilization measures

Propensity scoring

- Prior to matching, we identified 13,193 beneficiaries in the med-sync cohort and 156,987 beneficiaries in the control cohort
- After 1:1 greedy matching, 13,193 beneficiaries in the med-sync cohort were matched with 13,193 beneficiaries in the control cohort
- Standardized difference scores for categorical variables in matched and unmatched cohorts were below 0.02 denoting small effect sizes

Characteristics

Characteristics	Med-sync	Non-med-sync
Gender, n (%)		
Female	7,529 (57.1%)	7,548 (57.2%)
Male	5,664 (42.9%)	5,645 (42.8%)
Age, continuous		
Mean, Standard deviation	75.0 (11.6%)	75.1 (11.6%)
Age, categorical, n (%)		
18-64	1611 (12.2%)	1610 (12.2%)
65-74	4479 (34.0%)	4473 (33.9%)
75-84	4677 (35.5%)	4680 (35.5%)
85 and above	2426 (18.4%)	2430 (18.4%)
Race/Ethnicity, n (%)		
White	11909 (90.3%)	11959 (90.7%)
Black	714 (5.4%)	722 (5.5%)
Other	198 (1.5%)	185 (1.4%)
Asian	131 (1.0%)	114 (0.9%)
Hispanic	189 (1.4%)	180 (1.4%)
North American Native	37 (0.3%)	24 (0.2%)
Unknown	15 (0.1%)	9 (0.1%)

Characteristics	Med-sync	Non-med-sync
Income based enrollment, n (%)		
No Low-Income Subsidy	11211 (85.0%)	11276 (85.5%)
Dual Medicaid Enrollment	1508 (11.4%)	1459 (11.1%)
Qualified Medicare Beneficiaries	287 (2.2%)	282 (2.1%)
Specified Low-Income Beneficiary	187 (1.4%)	176 (1.3%)
Copayment Indicator, n (%)		
No coverage gap	6937 (52.6%)	6964 (52.8%)
Coverage gap	1078 (8.2%)	1063 (8.1%)
Catastrophic coverage	275 (2.1%)	254 (1.9%)
Unknown ¹	4903 (37.2%)	4912 (37.2%)
Geographic Region, n (%)		
South	6716 (50.9%)	6735 (51.1%)
Midwest	1133 (8.6%)	1130 (8.6%)
Northeast	4071 (30.9%)	4085 (31.0%)
West	1112 (8.4%)	1082 (8.2%)
Other	161 (1.2%)	161 (1.2%)

Characteristics

Characteristics	Med-sync	Non-med-sync
Type of Residence, n (%)		
Metro	11434 (86.7%)	11442 (86.7%)
Non-Metro	1557 (11.8%)	1542 (11.7%)
Unknown	202 (1.5%)	209 (1.6%)
Number of unique oral chronic medications		
Mean, Standard deviation	8.0 (7.5)	8.0 (7.3)
Elixhauser Comorbidity score		
Mean, Standard deviation	6.3 (4.3)	6.3 (4.2)
Outpatient visits		
Mean, Standard deviation	24.5 (18.9)	24.0 (18.5)
Inpatient hospitalizations		
Mean, Standard deviation	0.5 (1.3)	0.5 (1.2)
Emergency Department visits		
Mean, Standard deviation	1.0 (2.2)	0.9 (1.9)

Difference-in-difference (DID)

Utilization model

Component	12-month pre-index		12-month post-index		Difference in utilization pre and post index		Percent change in utilization pre and post index		DID	p-value
	Med Sync	Non-Med sync	Med Sync	Non-Med sync	Med Sync	Non-Med sync	Med Sync	Non-Med sync		
Inpatient hospitalizations, mean (n)	0.54	0.51	0.65	0.63	0.11	0.12	9.2%	10.5%	0.01	0.1966
Outpatient visits, mean (n)	24.56	24.02	24.92	25.55	0.36	1.53	0.7%	3.1%	1.17	<0.0001**
Emergency department visits, mean (n)	0.99	0.92	1.17	1.13	0.18	0.21	8.3%	10.2%	0.03	0.0372**
Pharmacy (drug) utilization,*** mean (n)	47.61	46.68	49.28	50.29	1.67	3.60	1.7%	3.7%	1.93	<0.0001**

**Significant at alpha=0.05

***Number of medications and pharmacy services obtained per member

Difference-in-difference (DID)

Cost model

Component*	12-month pre-index		12-month post-index		Difference in costs pre and post index		Percent change in costs pre and post index		DID	p-value
	Med Sync	Non-Med sync	Med Sync	Non-Med sync	Med Sync	Non-Med sync	Med Sync	Non-Med sync		
PM Total, mean (\$USD)	8,310	8,221	9,133	9,157	822	935	10%	11%	113	0.8436
PM Inpatient, mean (\$USD)	1,321	1,357	1,090	1,153	-230	-205	-17%	-15%	-25	0.8708
PM Outpatient, mean (\$USD)	2,809	2,775	2,907	2,957	98	182	3%	7%	84	0.6257
PM Emergency, mean (\$USD)	5,684	5,380	6,490	6,633	805	1,252	14%	23%	447	0.2683
PM Pharmacy, mean (\$USD)	3,694	3,732	3,995	3,961	302	229	8%	6%	-73	0.4095

*PM=per member, costs components had variable numbers of beneficiaries as not all beneficiaries have cost data for each component. All costs were adjusted to 2016 value

**Significant at alpha=0.05

***Number of medications and pharmacy services obtained per member

Discussion

- After enrollment in med-sync, the patients showed a lower increase in outpatient and emergency department visits than patients not enrolled in med-sync.
- Monthly visits to the pharmacy addresses potential contraindications, duplicate drug therapy, and errors.
- Other studies showed reduced hospital readmissions. Our study did not show a decrease in hospital utilization after enrollment. We did not explore readmissions in our study.
- Med-sync synchronizes all medications to a single pickup date, which reduces the number of trips to the pharmacy. Med-sync will likely improve adherence to medications.
- A single pickup date would have reduced the number of medications and pharmacy services in those who were enrolled in med-sync compared to those were not enrolled.

Limitations

- Unidentified confounders may affect our results and matching efficiencies.
- One-year comparison may limit the ability of finding long-term effects.
- The results may not be generalizable to other populations.

Conclusion

- There was no difference in the change in healthcare costs from pre-index to post-index between medication synchronization and controls in this sample of Medicare beneficiaries.
- Outpatient, emergency, and pharmacy utilizations changes were significantly lower in the med-sync cohort compared to the non-med-sync cohort in the 12-months after enrollment.
- Lower pharmacy utilization could be due to optimization of therapy during medication reviews of ABM med-sync and may have contributed to lower ER visits.

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THANK YOU

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