The Impact of Community Pharmacy-Delivered Medication Synchronization on Healthcare Costs and Utilization

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BACKGROUND

- Medication synchronization, also referred to as the Appointment Based Model (ABM), aligns a patient's monthly chronic medications to a pre-determined pickup date at the pharmacy.
- It was estimated that in the United States in 2014, 10% of independent pharmacies, 6% of stand-alone chain pharmacies, and 11% of other retail pharmacies (primarily mass merchant or grocery store) offered medication synchronization and these numbers continue to increase.[2]
- Research has demonstrated that community pharmacy-delivered medication synchronization is associated with improved medication adherence.[3-5]
- A recent cost benefit analysis model indicated medication synchronization offers payers a positive return on investment, however further research is needed to explore the impact of medication synchronization on costs and outcomes.[6]

OBJECTIVES

The primary objective of this study is to evaluate the association between the ABM and per-member-per-month (PMPM) total healthcare costs in a nationwide sample of Medicare beneficiaries.

Secondary objectives are to evaluate the association between:

1) Synchronization and outpatient, inpatient, and emergency department (ED) utilization
2) Synchronization and time to first hospitalization and/or ED visit following enrollment in a ABM program
3) Synchronization and medication adherence

METHODS: STUDY DESIGN

- This retrospective cohort study will analyze claims data using research identifiable files (RIFs) with data from up to 999,999 Medicare beneficiaries.
- The RIFs used in this study will be purchased from the Centers for Medicare and Medicaid Services (CMS) with the Research Data Assistance Center (ResDAC) facilitating the purchase request.
- The intervention cohort includes beneficiaries first enrolled in a medication synchronization program in 2014. The intervention cohort will be identified through medication claims data when a short-filled Part D prescription was dispensed from a pharmacy offering ABM which resulted in the alignment of chronic medications at the next fill (index date).
- A matched comparison cohort will be constructed using propensity score models of healthcare claims during the previous 12 months.[7]
- Eligible beneficiaries will be followed for 12 months from the index date to determine primary and secondary outcomes.
- All beneficiaries from the pharmacies identified as offering the ABM will be included in the sample. Beneficiaries determined to be receiving medication synchronization will be included in the intervention cohort. A random sample of beneficiaries (up to 999,999) from pharmacies not offering the ABM will be eligible for the matching control cohort.
- The sampling frame consists of 6975 beneficiaries per cohort. This was calculated to ensure 80% power for detecting a 10% lower mean PMPM total Medicare beneficiary cost in the intervention cohort compared to the comparison cohort with a type I error rate (α) of 0.05, employing a two-sided t-test for independent groups.
- The primary outcome will be analyzed using a linear mixed-effects regression model. Multivariate models will be constructed to evaluate secondary outcomes.
  - The model will be adjusted for health behaviors found to be predictive of PMPM overall health cost, using a univariate significance threshold of $p < 0.2$.
  - Overdispersion of count data will also be assessed by fitting negative binomial mixed regression models and comparing goodness of fit for these two distributions.

METHODS: CONCEPTUAL FRAMEWORK

- The conceptual framework for this research is Andersen's Phase-3 Model of Health Services Utilization[8] which associates three factors responsible for access to and use of health services. (Figure 2.)
- From the below factors, Determinants of Health Behavior will be used for propensity score matching of beneficiaries receiving medication synchronization through an ABM to a control cohort, with Health Behavior defining the cohort, and Health Outcomes being the primary and secondary outcomes.

Figure 2. **Study Framework: Andersen's Model and Proposed Study Variables**

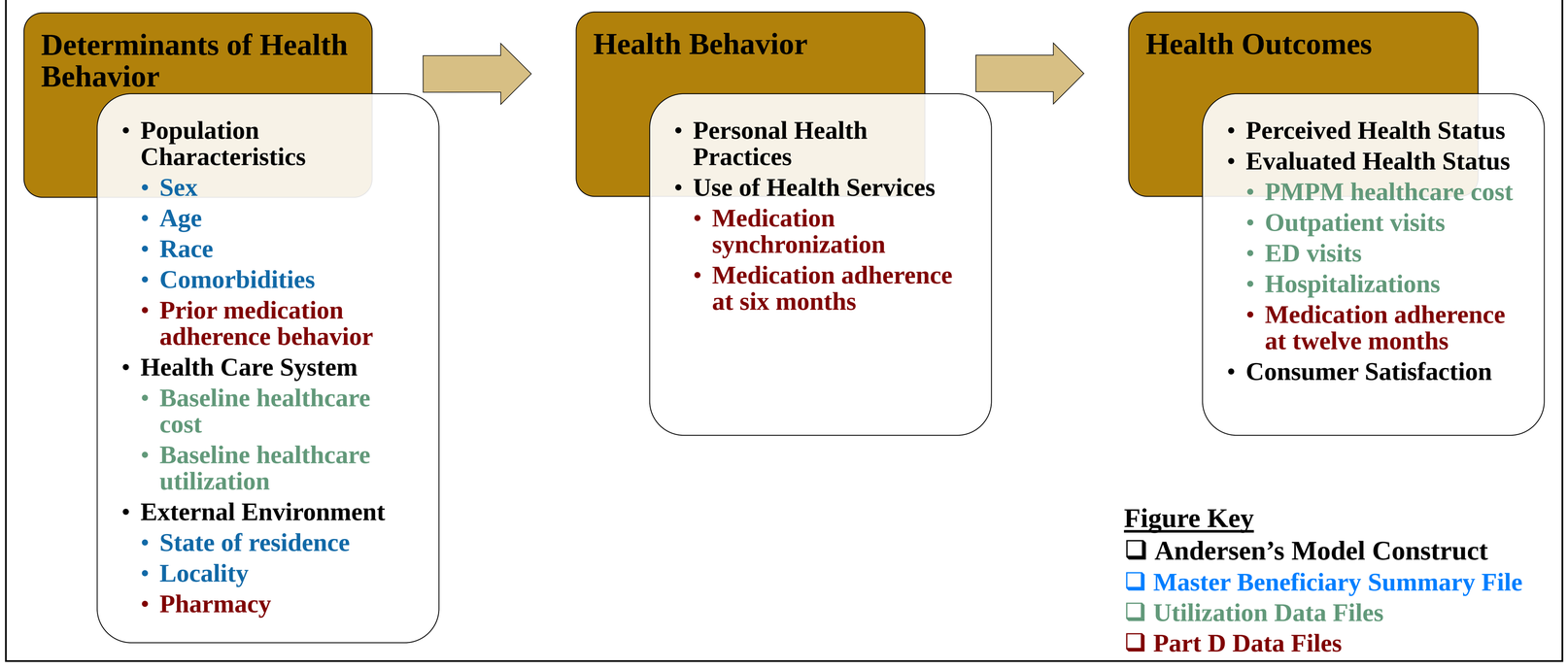


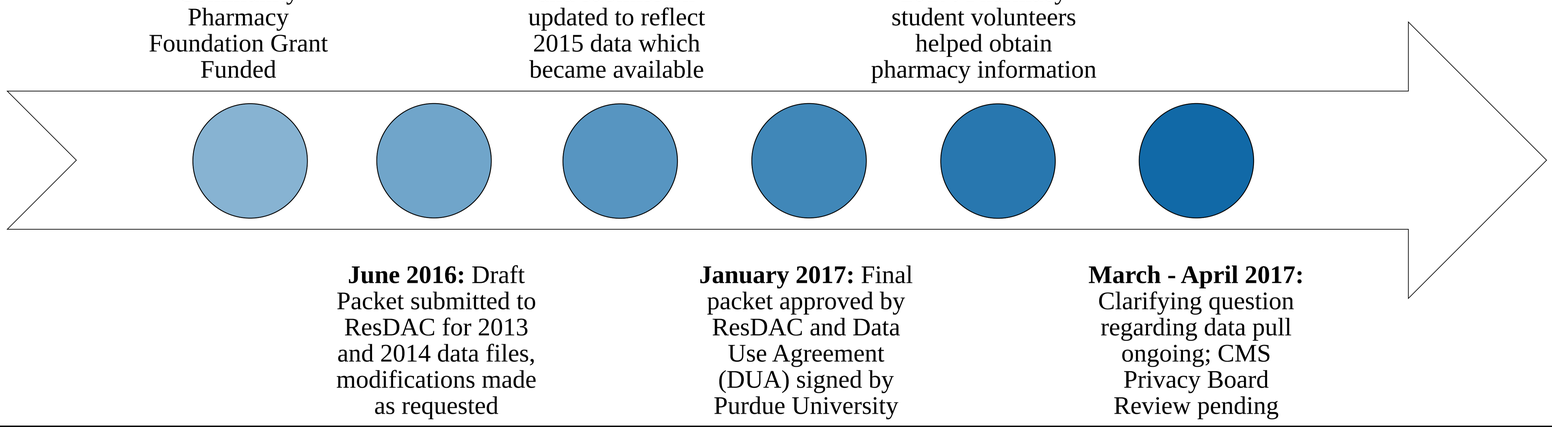
Table 1. **Research Identifiable Files Requested**	**File Years**
Master Beneficiary Summary File • Base Segment Aged/Blind/Disabled • Chronic Conditions • Other Chronic and Potentially Disabling Conditions • Cost and Utilization	**2013 – 2015**
Utilization Data • Inpatient Claims • Outpatient Claims • Carrier Claims • Home Health Claims • Skilled Nursing Facility Claims	**2013 – 2015**
Part D Data • Part D Event Data with Drug Characteristics • Plan Characteristics • Formulary Characteristics • Prescriber Characteristics • Pharmacy Characteristics	**2013 - 2015**

ABM PHARMACY IDENTIFICATION

- A national sample (n=2657) of community pharmacies was obtained (March 2015) from the APhA Foundation *Align my Refills* pharmacy locator webpage.
- From this list, National Provider Identifiers (NPI) were obtained for each of the pharmacies through the National Plan and Provider Enumeration System (NPPES) online registry.
- Student pharmacists made calls to individual pharmacies and corporate headquarters:
  - To confirm the pharmacy was offering medication synchronization services
  - To ascertain when these services began
  - To determine if the pharmacy was delivering these services with the components of the ABM
  - To verify the NPI was correct for each pharmacy

STUDY TIMELINE: IN PROGRESS

Figure 1. **Timeline of Completed Key Events**



NEXT STEPS

- Paperwork for data purchase is complete and pending review and approval of study by CMS Privacy Board.
  - Paperwork will be sent to CMS Privacy Board once pharmacy variable requested (synchronization indicator) is confirmed
  - Final Data Use Agreement (DUA) will be signed by CMS
- Investigators will submit DUA and study application to the Purdue University Institutional Review Board and purchase a computer isolated from the internet to house the data.
- After receipt of data:
  - Finalization of a "Data Dictionary"
  - Identification of the synchronization cohort
  - Construction of propensity scores and identification of a matched control cohort
  - Construction of linear mixed effects and multivariate models
  - Completion of data analysis using SAS 9.4
- Dissemination of results
- Future research, including a prospective randomized control trial, is needed to examine the economic and health outcome effects of medication synchronization in populations that do not self-select enrollment in the service.

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DISCLOSURES

Dr. Snyder has received fees for serving as a consultant for Westat, Inc. Drs. Lantaff, Zillich, Lourens, Murawski, Thomas III, Ott, and Ms. Jaynes report no financial relationships or potential conflicts of interest.

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