

## Introduction

- Primary medication non-adherence (PMN) is any instance whereby patients fail to initiate a pharmacotherapy regimen after receiving a prescription for new therapy. As the use of e-prescribing increases, PMN is receiving more attention. Currently, there is little in the literature that provides information on how to measure PMN across pharmacies reliably and what factors are related to PMN.
- The Pharmacy Quality Alliance (PQA) has developed a standardized definition for PMN and a quality measure to assess the rates of PMN in community pharmacies.
- The PQA PMN measure is calculated by dividing the number of unclaimed (not picked up after 30 days) electronic prescriptions for newly initiated drug therapy (or appropriate alternative) by the total number of electronic prescriptions for newly initiated drug therapy during the measurement period (for patients 18 and over). The measure only includes drugs from the following drug categories and therapeutic classes (combination products containing drugs from these categories/classes were also included):
  - HMG-CoA reductase inhibitors
  - Direct renin inhibitors
  - ARBs
  - ACE-inhibitors
  - Antiretrovirals
  - COPD medications & inhaled corticosteroids
  - Sulfonylureas
  - Biguanides
  - DPP-IV inhibitors
  - Thiazolidinediones
- This study is one of the first to use pharmacy prescription data to calculate PMN using the PQA standardized measure and to identify prescription and store factors associated with PMN.

## Objectives

- To measure PMN in a pharmacy grocery chain using data available from the pharmacy dispensing system.
- To identify the prescription-level (prescriber and patient) and store characteristics associated with unclaimed e-prescriptions.

## Methods

- The study was approved by the University of Mississippi IRB. A data use agreement was signed by the University and the pharmacy grocery chain.

### Measuring PMN

- The pharmacy grocery chain provided de-identified, transactional data for calendar years 2009 through January 2012 (de-identified, unique patient and stores codes were available) for 100 pharmacies. The PQA-developed PMN measure was used and PMN rates were calculated for each pharmacy in the large grocery chain as well as an overall PMN rate.
- Investigators examined adult individuals with a new electronic prescription for any of the included drugs during the measurement period and determined whether the medication or an appropriate alternative within the therapeutic class was claimed within 30 days.

## Methods (continued)

- The washout period for the data was 180 days prior to January 1, 2011. This period was used to account for an appropriate amount of time to determine whether a prescription was a newly initiated therapy for a patient. The PMN measurement period was from January 1, 2011 to December 31, 2011 (plus 30 days after to assess whether the prescription was claimed).

### Characteristics Associated with PMN

- Prescription-level variables were defined as patient and/or prescriber characteristics associated with a prescription. Prescription-level variables included in the analysis were: 1) prescriber type (four categories), 2) PQA defined drug class (five categories – certain categories were collapsed together), 3) patient gender, 4) patient age, 5) when the prescription was accompanied by another prescription on the same day, 6) payment source (3 categories), and 7) out-of-pocket costs associated with the prescription.
- The daily average number of prescription dispensed was calculated for each store (i.e., total number of prescription sold during the measurement period divided by a count of days “open” during the same period) and was used as a store-level variable in the analysis.

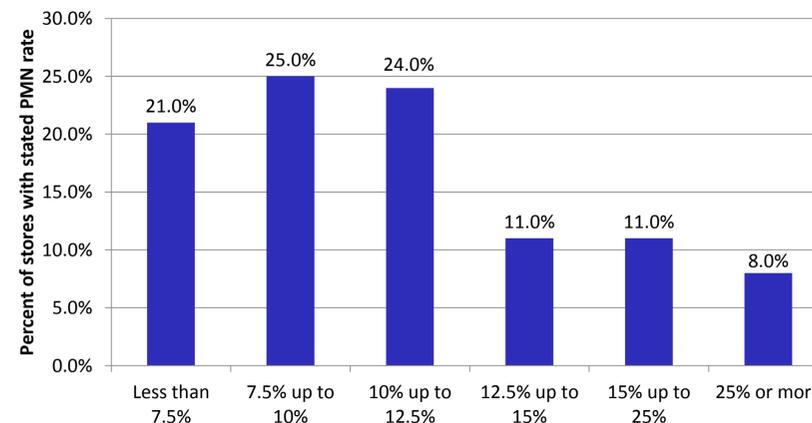
### Statistical Analysis

- Given that patients were clustered within pharmacies, prescription-level and store-level predictors of whether a prescription was unclaimed were assessed using multilevel logistic regression with a random intercept. PROC GLIMMIX in SAS version 9.3 was used.

## Results

- Of the e-prescriptions received by the pharmacy grocery chain during the one-year observation period, 29,184 were for new therapy as defined by the PMN measure, and 3,516 (12.1%) of those new prescriptions (or drug alternatives) were not claimed within the 30-day period. There was significant variability among the 100 pharmacies, ranging from 4.9% to 77.9% among the 100 pharmacies.

Distribution of PMN Rates Across Stores (n = 100)



## Results

### Results of Multivariable Multilevel Logistic Regression Analysis

| Variable   | Adjusted Odds Ratio | 95% Confidence Interval | P value |
|--|---------------------|-------------------------|---------|
| Prescriber type (vs. physician assistants & advanced practice nurses)          |                     |                         |         |
| Physician specialists  | 1.131               | (0.986, 1.298)          | 0.0788  |
| Physician primary care providers   | 1.231               | (1.098, 1.381)          | 0.0004  |
| Other  | 1.350               | (1.143, 1.595)          | 0.0004  |
| Drug class (vs. COPD medications & inhaled corticosteroids)                    |                     |                         |         |
| HMG-CoA reductase inhibitors   | 1.115               | (0.959, 1.297)          | 0.1582  |
| Direct renin inhibitors, ARBs, ACE-inhibitors                                  | 1.033               | (0.888, 1.202)          | 0.6736  |
| Biguanides, sulfonylureas, DPP-IV inhibitors, thiazolidinediones               | 1.161               | (0.986, 1.367)          | 0.0734  |
| Antiretrovirals  | 6.775               | (4.130, 11.114)         | <0.0001 |
| Gender, female (vs. male)  | 1.016               | (0.942, 1.097)          | 0.6727  |
| Age  | 0.995               | (0.992, 0.998)          | 0.0009  |
| Prescription accompanied by another prescription on the same day, no (vs. yes) | 0.716               | (0.662, 0.775)          | <0.0001 |
| Payment source (vs. other third party)   |                     |                         |         |
| Cash   | 1.027               | (0.914, 1.154)          | 0.6509  |
| Medicaid   | 1.145               | (0.907, 1.447)          | 0.2544  |
| Out-of-pocket cost   | 1.008               | (1.007, 1.009)          | <0.0001 |
| Store volume   | 0.995               | (0.992, 0.998)          | 0.0016  |

- Summary of the findings:** The estimated odds of an unclaimed prescription were significantly different among drug classes comprising the PQA PMN measure and were higher as out-of-pocket costs increased, when the prescription was accompanied by another prescription on the same day, and for primary-care physicians relative to physician assistants and advanced practice nurses. The estimated odds were slightly higher for younger individuals and when dispensed at stores with lower prescription volumes. Neither the gender of the patient nor the payment source were related to whether the prescription went unclaimed in the multivariable model.

## Discussion

- Based on the calculated rates, PMN is a significant problem in this setting. Efforts directed at further understanding this behavior and how to reduce its occurrence are warranted.
- This analysis was from the perspective of the pharmacy chain; given the limitations associated with the use of pharmacy dispensing data, it is possible that patients claimed their prescriptions at another setting and never informed the pharmacy.
- Understanding the prescription characteristics associated with unclaimed prescriptions is helpful when developing interventions targeted at patients at high-risk for PMN. It is also important to understand how prescription and store characteristics could influence PMN. Further research concerning the impact of other store-level variables (e.g., neighborhood-level characteristics) as well as possible cross-level interactions (e.g., prescription-level and store-level) is warranted.

## ACKNOWLEDGMENTS/DISCLOSURES

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