Using Linked Claims and EHR Real-World Data to Determine Medication Adherence Among Common Therapeutic Areas of Chronic Disease

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Introduction

- Medication adherence for chronic disease management is crucial for improving clinical outcomes and reducing healthcare costs.[1]
- In the United States (US), chronic disease poses a significant health burden, with 6 out of every 10 adults living with at least one chronic condition.[2]
- Diabetes and asthma are among the common chronic conditions in the US. As of 2021, the estimated prevalence of diabetes and asthma in the adult population was 14.7% and 8.0%, respectively.[3,4]
- Better understanding medication-specific adherence patterns using real-world data for prevalent chronic conditions such as diabetes and asthma offers valuable insights for enhancing medication adherence and improving health outcomes for individuals with these conditions.

Objective

Medication adherence is vital to disease management for patients with chronic illness. This study examined medication adherence among adult patients in the US with selected common chronic conditions, using linked commercial claims and electronic health records (EHR) data from 2015 to 2023.

Methods

Data source:

- De-identified Oracle electronic health record for ~110M patients over 133 health organizations across the US
- Nationally representative US closed claims database for ~90M EHR-linked patients

Eligibility criteria:

- Patients aged 18-64
- Diagnosed with type II diabetes, asthma, migraine, anxiety disorder, or insomnia
- At least one outpatient encounter between January 1, 2015 and June 30, 2023
- Medication prescribe at encounter

108 Million patients[1]

688 Million condition encounters[2]

399 Million medication encounters[2]

455 Million procedures[3]

174 Million immunizations[3]

49 Billion clinical results[3,4]

Variable definitions:

- Filled prescription: pharmacy claim within 30 days after prescription encounter
- Adherence: Patient who filled 80% or more of their prescriptions were considered adherent
- De-identified Oracle electric health record (EHR) data for was used to identify patients aged 18-64 who were diagnosed with type 2 diabetes, asthma, migraine, anxiety disorder, or insomnia who had at least one outpatient encounter between January 1, 2015, and June 30, 2023, and had a medication prescribed at the encounter.
- Pharmacy claims from a nationally representative US closed claims database for ~90M EHR-linked patients from the same time period were used to determine whether prescriptions were filled.
- Prescriptions were considered filled if they were filled within 30 days after the encounter. Patients who filled 80% or more of their prescriptions were considered adherent.
- Patient-level drug adherence was compared across therapeutic areas and drug-level fill rates were compared across drug classes.

**All data pulled from HealtheIntent® and current as of June 2023; [1]Calculated using distinct person IDs, which leverage a multipoint match algorithm to account for and remove duplicates within a single health system; patients who have visited multiple health systems may appear more than once in the data; [2]Number of patient visits (encounters) that include at least one condition or medication; [3]Each number of individual clinical results, procedures, or immunizations are counted; [4]Clinical results comprises individual labs, clinical events, and measurements captured during a patient's visit (encounter).*

Results

Table 1. Diabetes Prescription-Level Medication Adherence

- Out of 606,653 diabetes medication records, amylin analogs (73.7%) and GLP-1 receptor agonists (63.8%) had the highest fill rates, while thiazolidinediones (54.1%) and antidiabetic combination medications (52.4%) had the lowest fill rates.

	Filled		Not filled	
	N	%	N	%
Amylin analogs	42	73.7%	15	26.3%
GLP-1 receptor agonists	20175	63.8%	11434	36.2%
Insulin	131388	63.2%	76472	36.8%
Alpha-glucosidase inhibitors	180	60.8%	116	39.2%
Meglitinides	277	59.8%	186	40.2%
Biguanides	123994	59.2%	85644	40.9%
SGLT-2 inhibitors	15226	58.3%	10884	41.7%
Sulfonylureas	49372	58.0%	35772	42.0%
Dipeptidyl peptidase 4 inhibitors	10966	57.6%	8078	42.4%
Thiazolidinediones	10211	54.1%	8670	45.9%
Antidiabetic combinations	3960	52.4%	3591	47.6%

Table 2. Asthma Prescription-Level Medication Adherence

- Out of 119,136 asthma medication records, leukotriene modifiers (64.8%) and methylxanthines (61.0%) had the highest fill rates, while adrenal cortical steroids (53.7%) and adrenergic bronchodilators (53.3%) had the lowest fill rates.

	Filled		Not filled	
	N	%	N	%
Leukotriene modifiers	18967	64.8%	10319	35.2%
Methylxanthines	236	61.0%	151	39.0%
Inhaled corticosteroids	14428	60.6%	9373	39.4%
Anticholinergic bronchodilators	3307	59.3%	2266	40.7%
Bronchodilator combinations	22211	55.3%	17929	44.7%
Mast cell stabilizers	25	54.4%	21	45.7%
Adrenal cortical steroids	10519	53.7%	9080	46.3%
Adrenergic bronchodilators	162	53.3%	142	46.7%

Figure 1. Patient-level Diabetes Medication Adherence

- Among 95,980 linked diabetes patients, 45.3% were adherent.
- Out of the 11 diabetes drug classes examined, amylin analogs (57.1%) had the highest proportions of patients who were adherent to their medication.
- Antidiabetic combinations (33.0%) and thiazolidinediones (28.8%) had the lowest proportions of patients who were adherent to their medication.

Figure 2. Patient-level Asthma Medication Adherence

- Among 33,966 linked asthma patients, 45.6% were adherent.
- Out of the 8 asthma drug classes examined, leukotriene modifiers (45.5%) and inhaled corticosteroids (43.2%) had the highest proportions of patients who were adherent to their medication.
- Anticholinergic bronchodilators (34.9%) and adrenergic bronchodilators (32.3%) had the lowest proportions of patients who were adherent to their medication.

Conclusions

Using EHR and claims data from nationally representative databases, low medication adherence rates were observed among linked patients with diabetes and asthma, where slightly less than half were found to have filled their prescribed medication at least 80% of the time, though adherence rates vary by medication.

References

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