

ASCERTAINING MEDICATION ADHERENCE UTILIZING OPEN CLAIMS DATA



TriNetX

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OBJECTIVES

Comparative effectiveness studies, predictors in medical outcomes models, and targeting patients to medication therapy management programs are typical applications of medication adherence metrics. Adherence is usually calculated using “closed” claims data. These are fully adjudicated and contain data for all prescription fills available within a fixed period. A different source of claims data—“open” claims—is used much less frequently to measure adherence. These claims cover a much broader swath of payers, may not be fully adjudicated and may be missing claims for fills from pharmacies utilizing a clearinghouse not included in the pool of data providers. We set out to show that medication adherence can be determined using open pharmacy claims data.

METHODS

Using a commercially available open pharmacy claims dataset covering 99% of US payers, we calculated common measures of medication adherence for a sample of 99 patients. Data elements such as supply duration, quantity dispensed, fill number and corresponding date ranges are needed to determine Medication Possession Ratio (MPR), which measures the percentage of time a patient has access to a particular medication. Given the potential for an incomplete view of the claims lifecycle, we applied a number of heuristic rules to de-duplicate records for a given prescription fill where correction and denied claims may be submitted before the clearinghouse sends a final claim to the payer and a final remittance is sent back to the clearinghouse and ultimately the dispensing pharmacy.

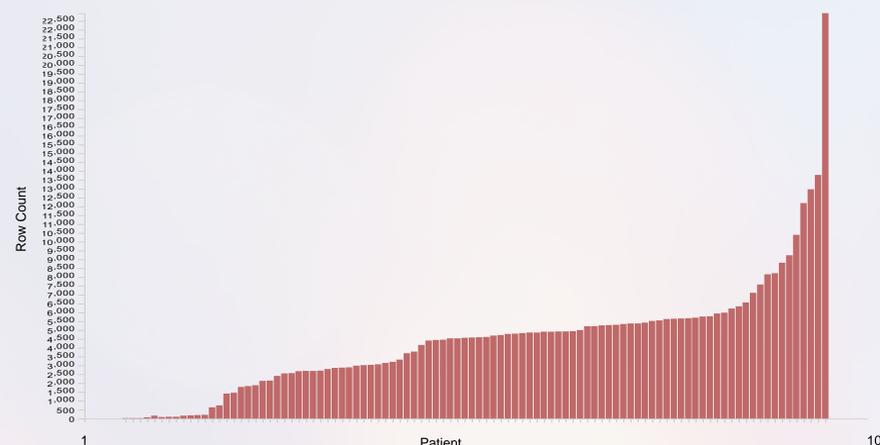


Figure 2. Number of individual rows in claims data per patient.
Note very high number of rows emblematic of open claims data.

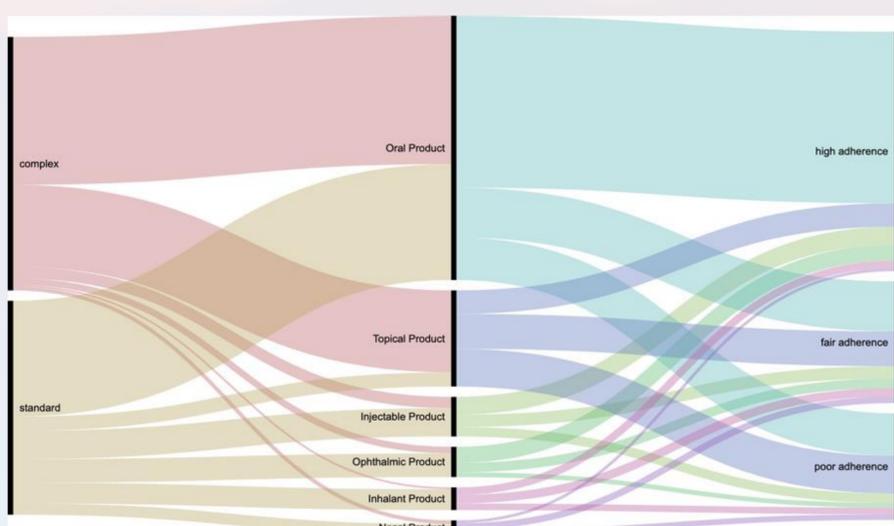


Figure 1. Relationship between regimen complexity, route of administration, and level of adherence. Expected distribution of route group with adherence; Proportion of high and fair adherence to poor adherence suggests known shortcoming of the medication possession ratio metric: an over estimation of adherence

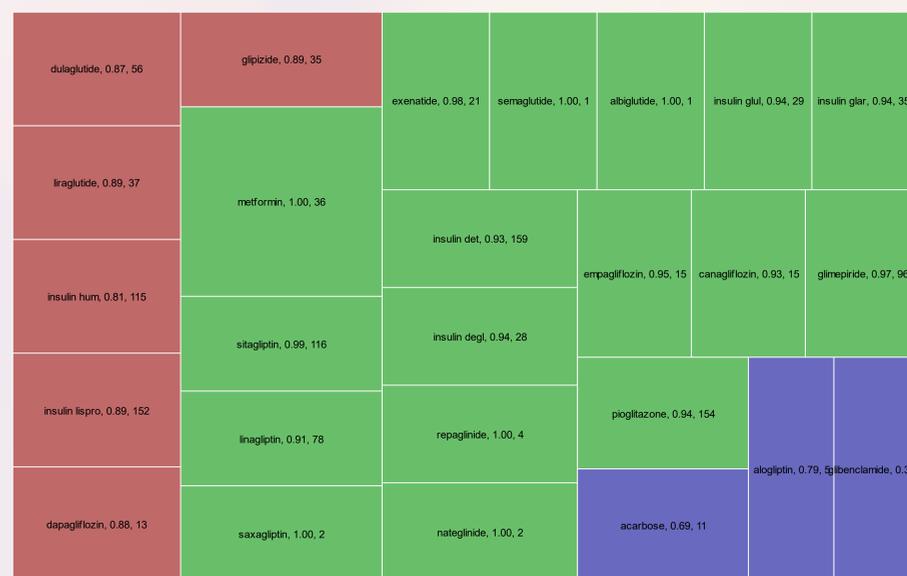


Figure 3. Tree map of medications used in diabetes. A majority of medications in the Diabetes drug class show adherence (red) or high adherence (green) with only a small portion being non-adherent (purple).

RESULTS

We calculated MPR for all drugs in the dataset. Adherence with MPR of 0.9 and above was considered high, 0.8-0.89 – fair, and under 0.8 – poor. We evaluated our calculations by visualizing the relationship between prescription complexity (>2 takes per day=complex) and route of administration to adherence.¹ The results are in line with our expectations. A Sankey diagram (see **Figure 1**) demonstrates, for example, that lower prescription complexity leads to better adherence and that patients are more compliant with oral medications. Also noteworthy in **Figure 1** is the relatively small cohort of poor adherence, suggesting MPR may over-estimate adherence. **Figure 2** depicts the volume of claims data per patient, illustrating the high volume of claims data where fringe cases may exist that influence the MPR calculation. **Figure 3** shows the impact of these influencers. The majority of medications in the Diabetes medication class show high adherence, where one might expect results in the fair and poor adherence categories based on well documented evidence.² But when we look at an overview of MPR and claim counts grouped by route group in **Figure 4**, we see results are in line with expectations for each group. For example, Implants have a perfect MPR (1.0); the Otic group, composed of medications used for acute infection and inflammation, has a poor MPR (0.42), unsurprisingly. The largest group, Oral, with a high MPR (0.90), consists of medications for chronic disease which tend to have higher adherence.

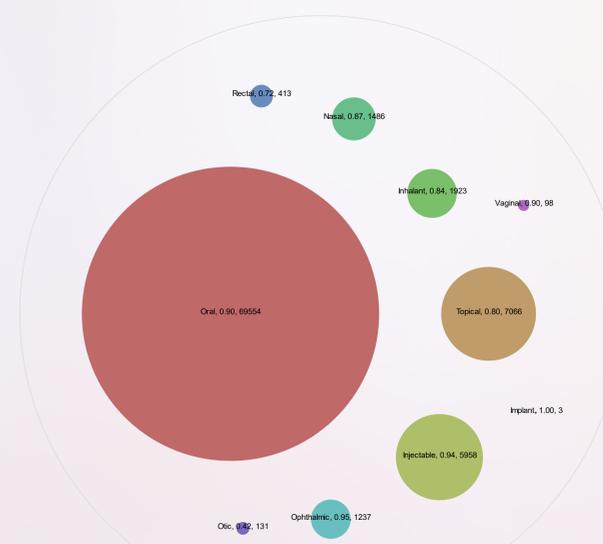


Figure 4. data summary. Average MPR and number of claims for each route group.

CONCLUSIONS

Open claims datasets pose unique challenges for calculating medication adherence. We demonstrated that it is possible to generate such metrics and confirmed our results by seeing expected trends in relationships between prescription complexity and the route of administration to medication adherence. Further investigation into factors that influence MPR calculation is needed.

1. Martin S, Wolters P, Calabrese S, Toledo-Tamula M, Wood L, Roby G et al. The Antiretroviral Regimen Complexity Index. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2007;45(5):535-544.
2. Polonsky W, Henry R. Poor medication adherence in type 2 diabetes: recognizing the scope of the problem and its key contributors. Patient preference and adherence. 2016(10):1299.