Walgreens

Estimation of the Pharmacy Quality Alliance performance metric for adherence to non-infused biologics to treat Rheumatoid Arthritis (PDC-RA)

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This study is a comparison of the PQA measure of adherence to non-infused biologic medications used to treated rheumatoid arthritis in a national benchmarch sample and in a pharmacy only dataset.

BACKGROUND

- Pharmacies may not routinely receive complete ICD-10 information, which complicates accurate estimation of the adherence to non-infused biologic medications used to treat Rheumatoid Arthritis (PDC-RA) measure1 by making it difficult to exclude other inflammatory conditions.

OBJECTIVES

- To estimate and compare the PDC-RA measure in a national benchmark using Marketscan data to specialty pharmacy claims data and to account for an predict RA diagnosis when missing.

METHODS

- One year of pharmacy data from a large, national pharmacy chain (2018) and one year of Marketscan data (2017) were used for this analysis.
- In both datasets, patient medication fills for the following meds included in the PDC-RA metric were examined (adalimumab, abatacept, anakinra, certolizumab pegol, etanercept, golimumab, sarilumab, tocilizumab, tofacitinib). Baracitinib was not approved until 2018, so fills for it were not available in Marketscan and very few fills were present in the pharmacy data. Upadacitinib did not receive approval until 2019, so there were no fills for it in either dataset.
- PDC-RA criteria were applied to both datasets to calculate PDC-RA (% patients with PDC > .80). Given that the pharmacy data did not include health plan enrollment data, a proxy of at least 150 days between fills was used[1].
- The pharmacy dataset had incomplete diagnosis information as it was sourced from multiple channels, whereas the Marketscan data had full diagnosis information.
- Marketscan data was split into training and test datasets to build a predictive model of RA diagnosis stratified by RA diagnosis to ensure an equal % diagnosed in both datasets.
- The model consisted of a logistic regression predicting RA diagnosis (yes/no) from age, gender, and medications used. It was developed on the Marketscan training dataset and the resulting parameters were applied to the Marketscan test dataset and pharmacy dataset for comparison.

- As the Marketscan data represents a commercial-only population (aged 18-64) the pharmacy data were restricted to only patients between ages 18 and 64 for a more direct comparison of the resulting estimates.
- The cut score for the Marketscan was derived by the Euclidean Distance formula:

  D = Sqrt ((1-Sensitivity)^2 + (1-Specificity)^2)

RESULTS

- Marketscan data were divided via random stratified sampling into a training (n = 39,107) and test (n = 39,108) dataset.
- Age, gender, and medication used were all significant predictors of RA diagnosis. The exception was adalimumab which was not significant and excluded from the final model and parameter estimates in the training dataset, likely due to its high number of approved indications.
- After applying PDC-RA criteria, a total of 32,160 patients from the Marketscan test data (MkS) and 83,132 pharmacy patients (Ph) were eligible for comparison.
- The two samples were similar with regard to gender (% female: MkS = 59.1%, Ph = 62.0%), mean age (in years: Mks = 47.32, Ph = 47.52), and medication use (**Table 1**).

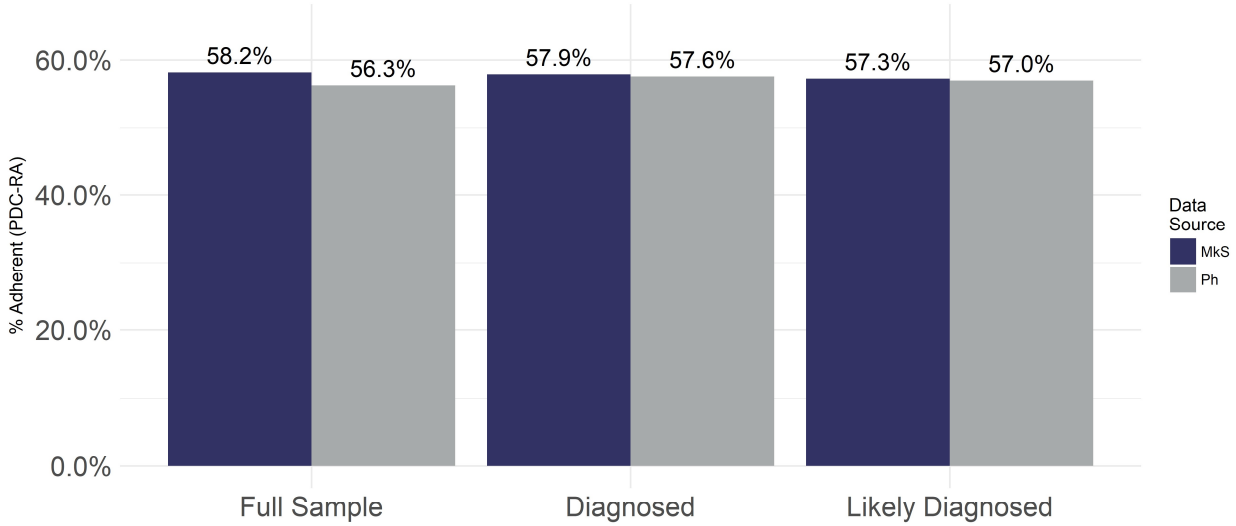
Table 1: Sample Demographic Characteristics

		Marketscan (n = 32,160)		Pharmacy (n = 83,132)	
Variable		n	%	n	%
Gender					
	Female	18,992	59.1%	51,541	62.0%
	Male	13,168	40.9%	31,591	38.0%
Age (M, SD)		47.32	11.89	47.52	11.97
Medications					
	Abatacept	1,151	3.6%	3,269	3.9%
	Adalimumab*	19,257	59.9%	47,135	56.7%
	Anakinra	86	0.3%	0	0.0%
	Barcitinib**	0	0.0%	72	0.1%
	Certolizmub Pegol	1,370	4.3%	2,878	3.5%
	Etanercept	9,178	28.5%	23,119	27.8%
	Golimumab	962	3.0%	2,723	3.3%
	Sarilumab	45	0.1%	368	0.4%
	Tocilzumab	722	2.3%	1,940	2.3%
	Tofacitinib	1,856	5.8%	7,253	8.7%

*not a significant predictor of diagnosis, not in predictive model **Not in MkS data, not in predictive model.

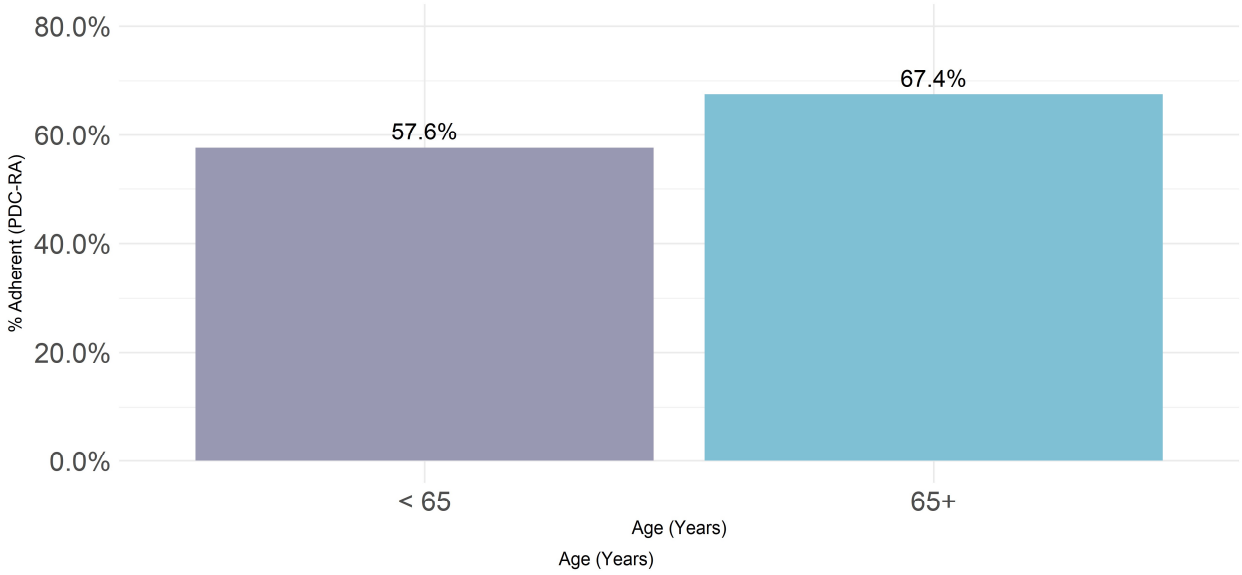
- When diagnosis was not taken into account, MkS had slightly higher PDC-RA than Ph. When only patients with diagnosis were compared, the two samples had very similar PDC-RA estimates. This was true also when examining only model-identified likely RA patients. However, the estimate of PDC-RA for Likely Diagnosed in the pharmacy data included 5,638 more patients than when examining diagnosis alone (a 17.5% increase in sample; **Figure 1**).

Figure 1: PDC-RA – Full Sample, by Diagnosis, and by Likely Diagnosis



- Analyses were limited by age for comparison purposes (Marketscan representing a commercial population aged 18-64 years). So we compared adherence between older pharmacy patients (> 65) and younger pharmacy patients (18-64) with a diagnosis, and found that older patients had significantly higher adherence ($p < .001$; **Figure 2**).

Figure 2: PDC-RA – Diagnosed by Age (Pharmacy Data)



DISCUSSION/CONCLUSIONS

- We estimated PDC-RA in both Pharmacy-only data and the Marketscan commercial claims data.

- Examining PDC-RA both when diagnosis was accounted for and when it was not suggests that to get an accurate estimation of PDC-RA diagnosis is required. However this may be problematic for datasets (e.g., Pharmacy only data) where diagnosis information is not available for all patients, particularly those who utilize their local pharmacy.
- Our predictive model developed on the Marketscan data was successful in identifying likely RA patients and as a result, estimates of PDC-RA were closer to estimates of PDC-RA when diagnosis was accounted for than they were to when it was not accounted for.
- Critically, the 17.5% more patients were identified when estimating likely diagnosis than if using only available diagnosis information. This suggests that estimating likely diagnosed patients can help increase the stability of the estimate and potentially identify more patients for adherence interventions.
- Finally, in the Pharmacy data we found that PDC-RA estimates were significantly higher in diagnosed patients who were 65 years of age or older.
- The predictive model was developed on a commercial-only, younger population, so it is unclear how well it applies to an older general population.
- Moreover, this study was limited in that the data available did not account for all medications currently included in PDC-RA given approval dates. Also, PDC-RA data estimated from a single pharmacy may provide an incomplete picture as it cannot account for patients who switched pharmacies but who remained adherent.
- Future work should focus on using the most up-to-date data available given approval dates and the increasing number of indications for these medications.

References:
[1.] 2019 PQA Measurement Manual. Pharmacy Quality Alliance. Alexandria, VA; 2019.

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All authors were employees of Walgreen Co at time of analysis.