A Descriptive Study of Multiple Sclerosis Patient Characteristics in Open- and Closed-Claims Patient Populations Using Komodo's Healthcare Map™

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Introduction

Background

Traditionally, the utilization of open-claims data has not been widely accepted for use in research studies since it has been perceived as less reliable and comprehensive compared to closed-claims data.[1] However, recent advancements in data-linking technologies have enabled the integration of open claims from multiple sources, leading to improved completeness and accuracy for research studies.[2, 3]

In the context of less common disease states such as multiple sclerosis (MS), leveraging a broader dataset that encompasses both open- and closed-claims data can provide valuable insights into patient characteristics and the overall disease burden. This approach helps researchers to better understand the nuances of the disease and potentially identify gaps in care or areas for intervention.

It is important to note that not all patient data derived from open claims is suitable for research purposes. Nevertheless, there are several potential methods for identifying high-quality open-claims patients that can be utilized in scientific investigations. One such method involves selecting patients with a high volume of claims, which may indicate a more comprehensive and accurate representation of their healthcare journeys.

The primary objective of this study is to describe and better understand closed- and high-volume open-claims patients with MS who are treated with select disease-modifying therapies (DMTs). Ultimately, this analysis will contribute to the understanding of how researchers can effectively leverage open-claims data in conjunction with closed claims data to enhance the generalizability and applicability of research results, providing more accurate insights into real-world patient populations.

Objective

To describe the baseline demographics, claims volume distribution, and healthcare resource utilization (HCRU) among patients with closed claims and those with a high volume of open claims.

Methods

Study Design

- This retrospective, observational study was conducted using de-identified, administrative open- and closed-claims data from Komodo's Healthcare Map
- Treatment cohorts: cladribine (CLAD), dimethyl fumarate (DMF), ocrelizumab (OCR), glatiramer acetate (GA), ozanimod (OZD)
- Study period: January 1, 2016–May 31, 2021
  - Index identification period: January 1, 2019–May 31, 2021
  - Index date: first claim for select MS treatment
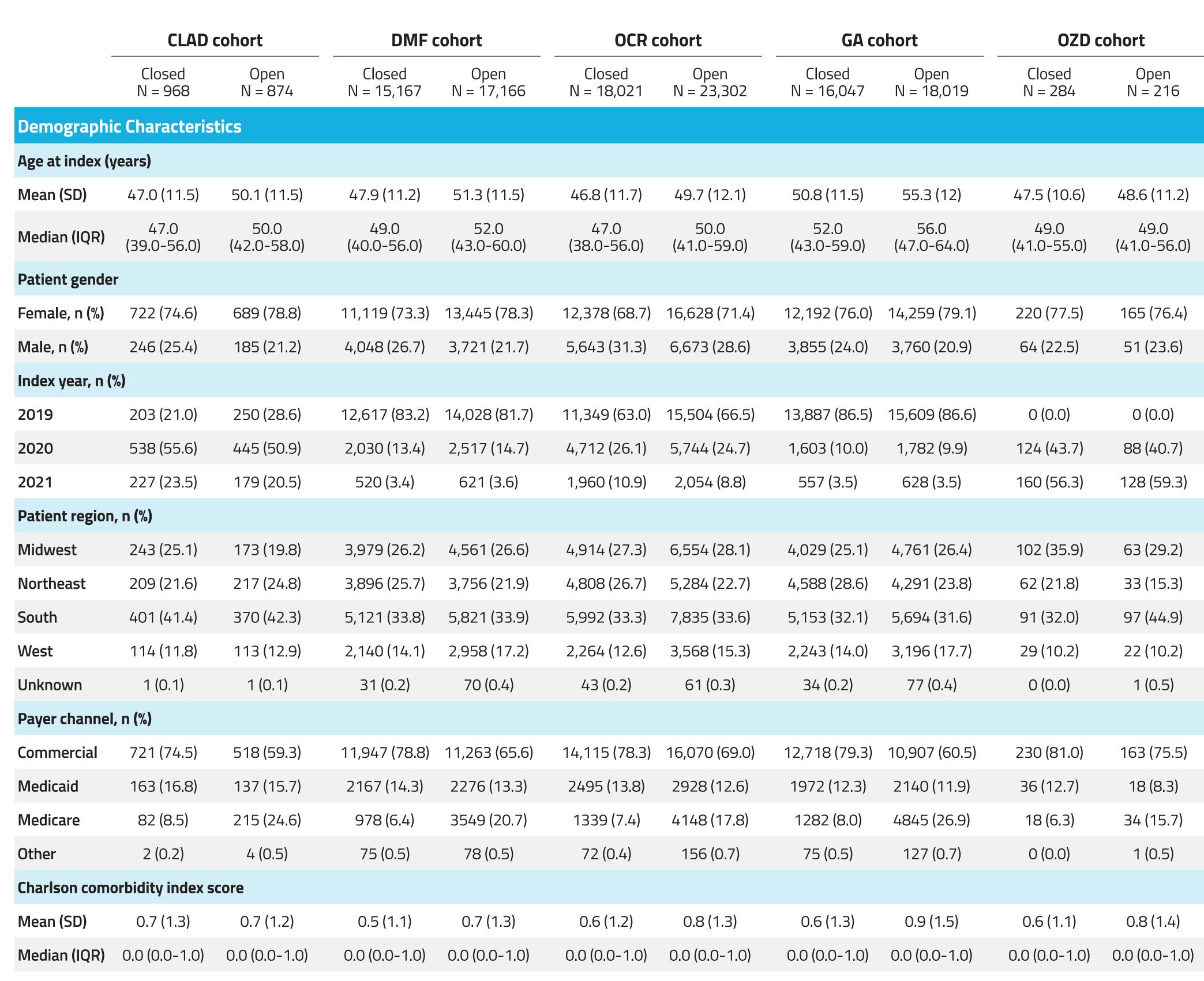 - Baseline period: 12 months prior to index date

Inclusion/Exclusion Criteria

- ≥1 diagnosis for MS (ICD9: 340; ICD10: G35)
- ≥1 claim for the select MS treatments during index identification period qualified into each respective patient cohort (non-mutually exclusive)
- Age ≥18 years as of index date
- No pregnancy claims
- For closed patient cohorts, continuously enrolled (CE) to medical (Mx) and pharmacy (Rx) benefit for ≥12 months before and after the index date
- A total of 10 patient cohorts were analyzed across five MS treatments and two claim-cohort types based on CE (closed vs. high-volume open patients)
  - Closed-claim patients met the full inclusion/exclusion criteria
  - Open-claim patients met all of the inclusion/exclusion criteria, with the exception of 12 months CE before and after index date
    - Open-claim patients were further separated into high- vs. low-claims volume subgroups based on the median claims volume among all open patients for each index treatment cohort; the high-volume open patient cohort was included in the analysis

Key Study Variables

- Baseline characteristics: Patient age, gender, index year, region, payer channel, Charlson Comorbidity Index (CCI)
- Claims volume distribution: Number of Mx and Rx claims
- HCRU: Number of inpatient (IP), outpatient (OP), and emergency room (ER) visits

Results

Table 1. Baseline Characteristics

	CLAD cohort		DMF cohort		OCR cohort		GA cohort		OZD cohort	
	Closed N = 968	Open N = 874	Closed N = 15,167	Open N = 17,166	Closed N = 18,021	Open N = 23,302	Closed N = 16,047	Open N = 18,019	Closed N = 284	Open N = 216
Demographic Characteristics										
Age at index (years)										
Mean (SD)	47.0 (11.5)	50.1 (11.5)	47.9 (11.2)	51.3 (11.5)	46.8 (11.7)	49.7 (12.1)	50.8 (11.5)	55.3 (12)	47.5 (10.6)	48.6 (11.2)
Median (IQR)	47.0 (39.0–56.0)	50.0 (42.0–58.0)	49.0 (40.0–56.0)	52.0 (43.0–60.0)	47.0 (38.0–56.0)	50.0 (41.0–59.0)	52.0 (43.0–59.0)	56.0 (47.0–64.0)	49.0 (41.0–55.0)	49.0 (41.0–56.0)
Patient gender										
Female, n (%)	722 (74.6)	689 (78.8)	11,119 (73.3)	13,445 (78.3)	12,378 (68.7)	16,628 (71.4)	12,192 (76.0)	14,259 (79.1)	220 (77.5)	165 (76.4)
Male, n (%)	246 (25.4)	185 (21.2)	4,048 (26.7)	3,721 (21.7)	5,643 (31.3)	6,673 (28.6)	3,855 (24.0)	3,760 (20.9)	64 (22.5)	51 (23.6)
Index year, n (%)										
2019	203 (21.0)	250 (28.6)	12,617 (83.2)	14,028 (81.7)	11,349 (63.0)	15,504 (66.5)	13,887 (86.5)	15,609 (86.6)	0 (0.0)	0 (0.0)
2020	538 (55.6)	445 (50.9)	2,030 (13.4)	2,517 (14.7)	4,712 (26.1)	5,744 (24.7)	1,603 (10.0)	1,782 (9.9)	124 (43.7)	88 (40.7)
2021	227 (23.5)	179 (20.5)	520 (3.4)	621 (3.6)	1,960 (10.9)	2,054 (8.8)	557 (3.5)	628 (3.5)	160 (56.3)	128 (59.3)
Patient region, n (%)										
Midwest	243 (25.1)	173 (19.8)	3,979 (26.2)	4,561 (26.6)	4,914 (27.3)	6,554 (28.1)	4,029 (25.1)	4,761 (26.4)	102 (35.9)	63 (29.2)
Northeast	209 (21.6)	217 (24.8)	3,896 (25.7)	3,756 (21.9)	4,808 (26.7)	5,284 (22.7)	4,588 (28.6)	4,291 (23.8)	62 (21.8)	33 (15.3)
South	401 (41.4)	370 (42.3)	5,121 (33.8)	5,821 (33.9)	5,992 (33.3)	7,835 (33.6)	5,153 (32.1)	5,694 (31.6)	91 (32.0)	97 (44.9)
West	114 (11.8)	113 (12.9)	2,140 (14.1)	2,958 (17.2)	2,264 (12.6)	3,568 (15.3)	2,243 (14.0)	3,196 (17.7)	29 (10.2)	22 (10.2)
Unknown	1 (0.1)	1 (0.1)	31 (0.2)	70 (0.4)	43 (0.2)	61 (0.3)	34 (0.2)	77 (0.4)	0 (0.0)	1 (0.5)
Payer channel, n (%)										
Commercial	721 (74.5)	518 (59.3)	11,947 (78.8)	11,263 (65.6)	14,115 (78.3)	16,070 (69.0)	12,718 (79.3)	10,907 (60.5)	230 (81.0)	163 (75.5)
Medicaid	163 (16.8)	137 (15.7)	2167 (14.3)	2276 (13.3)	2495 (13.8)	2928 (12.6)	1972 (12.3)	2140 (11.9)	36 (12.7)	18 (8.3)
Medicare	82 (8.5)	215 (24.6)	978 (6.4)	3549 (20.7)	1339 (7.4)	4148 (17.8)	1282 (8.0)	4845 (26.9)	18 (6.3)	34 (15.7)
Other	2 (0.2)	4 (0.5)	75 (0.5)	78 (0.5)	72 (0.4)	156 (0.7)	75 (0.5)	127 (0.7)	0 (0.0)	1 (0.5)
Charlson comorbidity index score										
Mean (SD)	0.7 (1.3)	0.7 (1.2)	0.5 (1.1)	0.7 (1.3)	0.6 (1.2)	0.8 (1.3)	0.6 (1.3)	0.9 (1.5)	0.6 (1.1)	0.8 (1.4)
Median (IQR)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)

Abbreviations:
IQR: interquartile range; SD: standard deviation.

Notes:
[1] Closed patients were defined as patients with continuous enrollment to Mx and Rx during the 12-month period prior to the index date.
[2] All baseline characteristics are assessed using a 12-month baseline period.

Baseline Demographics Results (Table 1)

- Across all five cohorts, closed patient cohorts had a lower mean age and higher proportion of patients with commercial coverage compared to the high-volume open patient cohorts.
- Gender, geographic region, and CCI score distributions were consistent between closed and high-volume open patient cohorts.

Claims Volume Distribution Results (Figures 1 and 2)

- Median claims volume was numerically higher in the high-volume open patient cohorts compared to closed patient cohorts. This trend was consistent for Mx and Rx claims volume in all five treatment cohorts.
- Mx claims volumes (closed vs. high-volume open: CLAD 28 vs. 33; DMF 21 vs. 24; OCR 30 vs. 34; GA 21 vs. 25; OZD 26 vs. 30) were more similar than Rx claims volumes (CLAD 31 vs. 48; DMF 28 vs. 42; OCR 25 vs. 35; GA 30 vs. 48; OZD 29 vs. 36).

HCRU (Figures 3 and 4)

- Closed and high-volume open patients had a similar median number of OP visits per patient for each cohort; all differences were within 1.5 visits.
- Across all five treatment cohorts, closed patients had numerically lower mean numbers of IP admissions. Median IP admissions and ER visits were zero for all treatment cohorts for both closed and high-volume open patients.

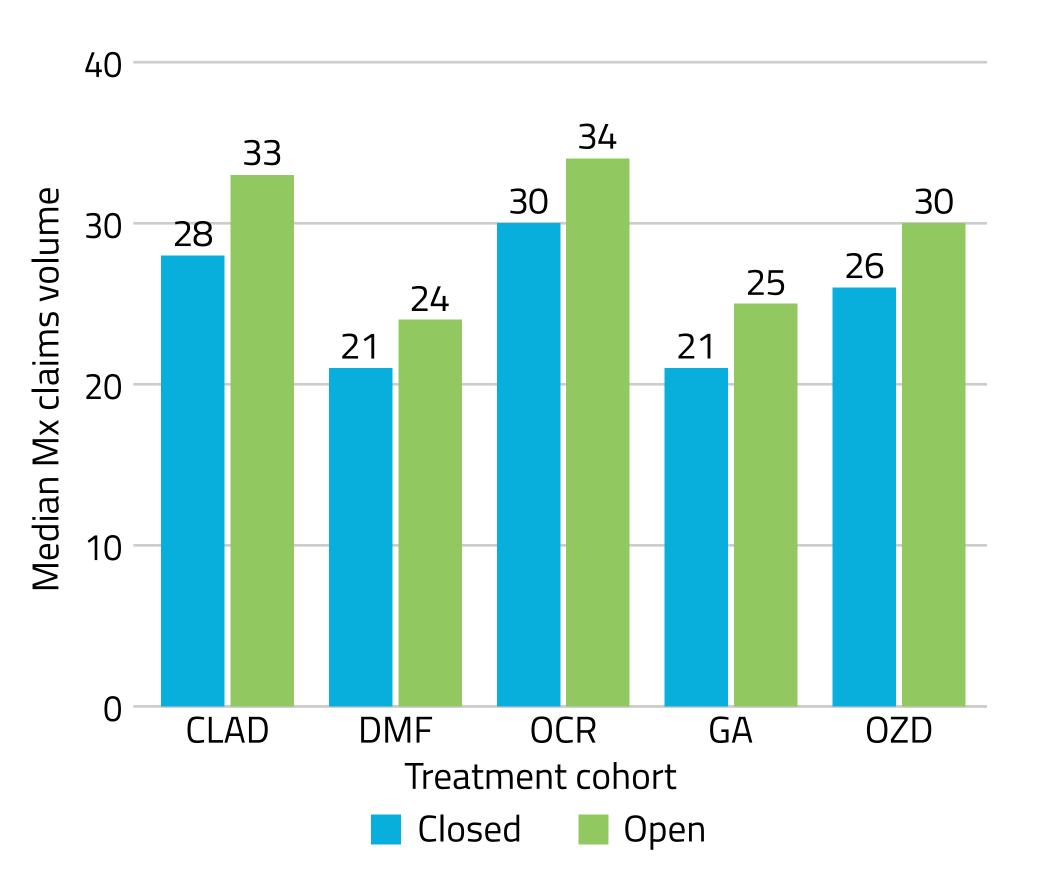Figure 1. Median Mx Claims Volume During 12-Month Baseline Period

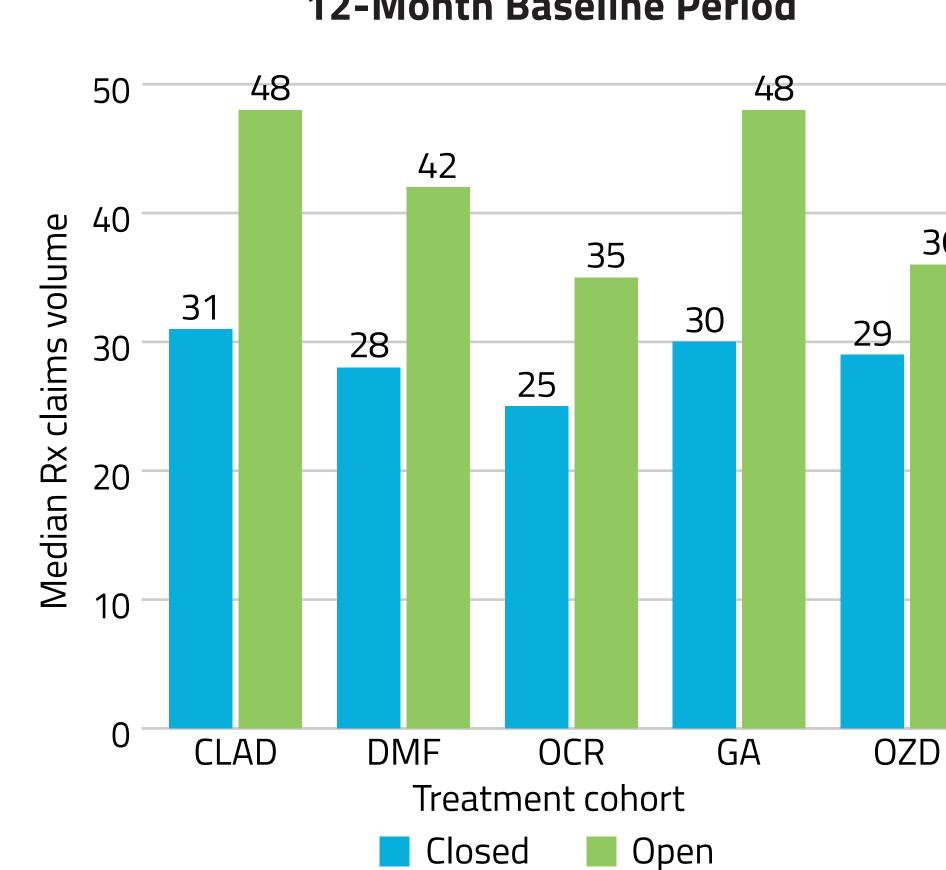Figure 2. Median Rx Claims Volume during 12-Month Baseline Period

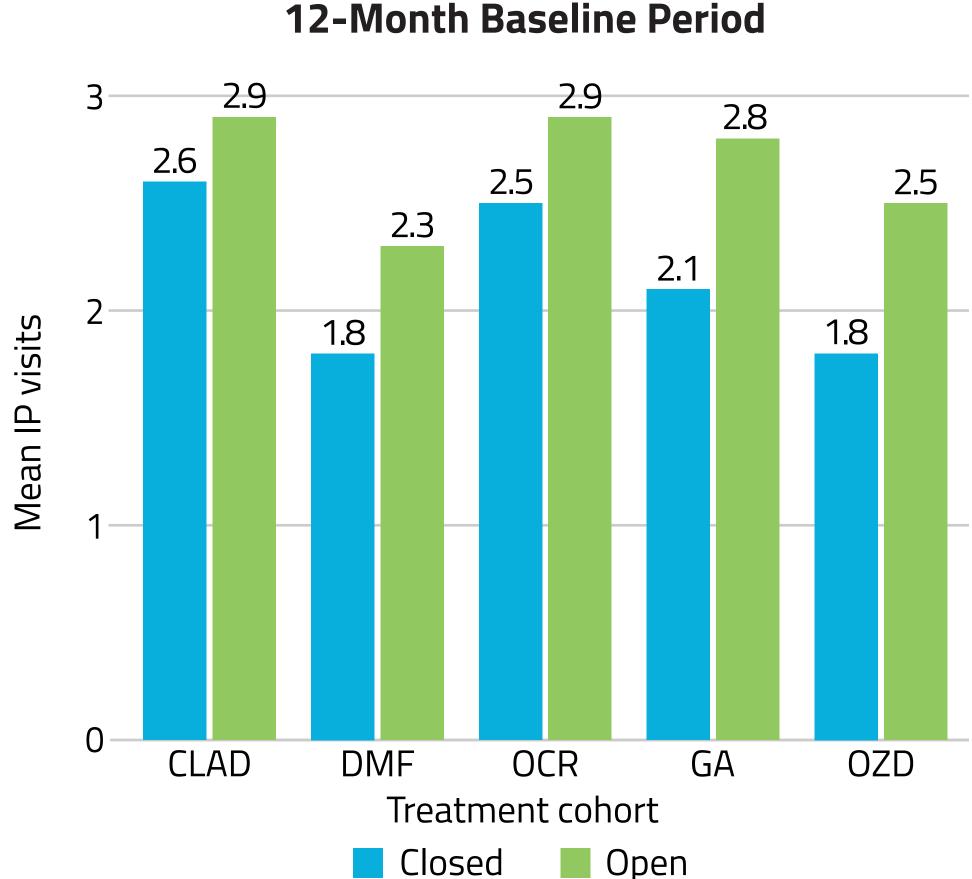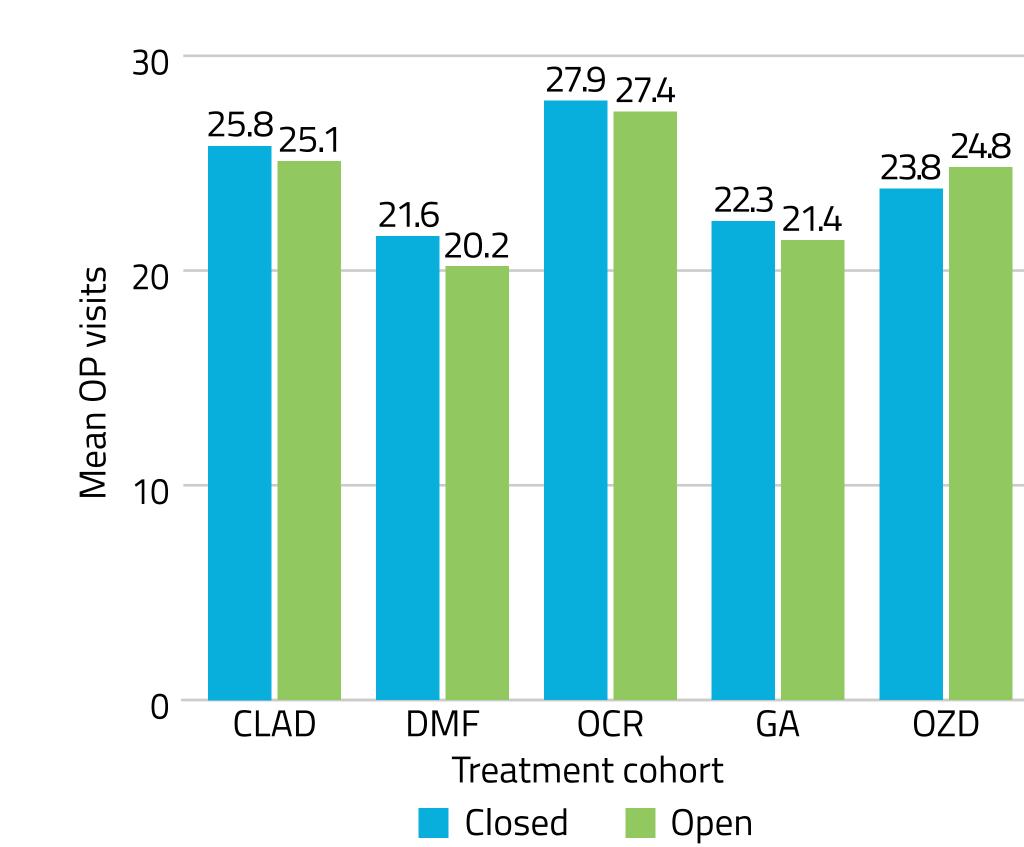Figure 3. Mean Inpatient Visits During 12-Month Baseline Period

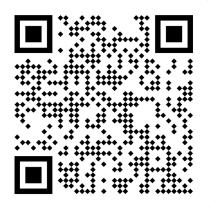Figure 4. Mean Outpatient Visits During 12-Month Baseline Period

Conclusion

Regarding demographics characteristics, the general trends observed between the closed and high-volume open cohorts were consistent. However, some differences were observed, particularly in terms of age, payer channel, and Mx/Rx claims volume. These findings represent an initial step toward understanding the characteristics of open-claims patients and how they compare to closed-claims patients. Further analyses will be necessary to fully understand the strengths and limitations of leveraging open-claims data in conjunction with closed-claims data for robust observational studies, and to develop high-fidelity patient populations with open-claims data.

References

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