

# Impact of social determinants of health on multiple sclerosis adherence and persistence for patients using a national mail-order specialty pharmacy



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## Background

- Multiple sclerosis (MS) is a neurodegenerative disorder that is characterized by increasing disability over time.<sup>1</sup> Socioeconomic and healthcare disparity is associated with multimorbidity in multiple sclerosis.<sup>2</sup>
- Disease-modifying therapy (DMT) can slow progression of disease, prevent relapses and improve quality of life.<sup>3</sup>
- Poor adherence and persistence to therapy may result in treatment failure, progression of disease, and lower quality of life.
- Proactively assessing MS patients at risk for poor adherence can allow specialty pharmacy staff to provide additional support and make interventions.
- The purpose of this study is to evaluate the association between demographic and socioeconomic factors on medication adherence and persistence among multiple sclerosis patients.

## Methods

**Study Design:** Single-center, observational, retrospective, cohort study

**Primary outcome:** Patient adherence was measured using proportion of days covered (PDC) with optimal adherence defined as PDC  $\geq$ 80%

**Secondary Outcome:** Persistence was measured using days on therapy (DOT) with discontinuation defined as  $\geq$  60-day gap in therapy

**Inclusion Criteria:** Patients  $\geq$ 18 years who received DMT with a diagnostic code associated with multiple sclerosis (i.e., ICD-10 G35), initial dispense date between January 1, 2021 and December 31, 2021

**Exclusion Criteria:** Less than 2 fills of DMT, non-disease modifying therapies (i.e., dalfampridine)

**Data Source:** Demographic, clinical, and transactional data was collected from pharmacy prescription processing system

**Study timeframe:** Unique 12-month time period per patient between January 1, 2021 and December 31, 2022 based on index date.

**Variables:** Patient age, sex, concomitant disease count, concomitant medication count, patient out-of-pocket, third-party payor, days on therapy, max single gap day, PDC

**Statistical analysis:** Descriptive statistics were used to report patient demographics. Logistic regression analysis with PDC and persistence, as a binary measure. Alpha was set at 0.05 with a p-value of  $\leq$ 0.05 considered significant

## Results

**Table 1. Demographics**

|   |                     |
|---|---------------------|
| Patient count, n                                    | 30,965              |
| Average age, years $\pm$ SD                         | 51.4 $\pm$ 12.1     |
| Female sex, %                                       | 75.9%               |
| Comorbidity count, mean $\pm$ SD                    | 2.3 $\pm$ 2.0       |
| Concomitant medications, mean $\pm$ SD              | 3.8 $\pm$ 2.4       |
| Average patient out-of-pocket per fill, \$ $\pm$ SD | 104.35 $\pm$ 436.95 |
| Average DOT, days $\pm$ SD                          | 315.7 $\pm$ 107.1   |
| Average PDC, % $\pm$ SD                             | 89 $\pm$ 51         |

**Table 2. Insurance Type Distribution**

| Insurance type                  | Patients, n |
|---------------------------------|-------------|
| Medicare/Medicaid Dual Eligible | 921         |
| Medicaid                        | 1,106       |
| Medicare Advantage              | 2,123       |
| External Plans                  | 3,122       |
| Medicare Part D                 | 3,228       |
| Commercial                      | 9,331       |
| Non-Health Plan PBM             | 12,020      |

**Table 3. Adherence Logistic Regression Analysis**

| Variable                                    | Odds Ratio                      | Confidence Interval | p-value            |                  |
|---|---------------------------------|---------------------|--------------------|------------------|
| <b>Mean age, years</b>                      | <b>0.9880</b>                   | <b>0.986-0.991</b>  | <b>&lt;0.001</b>   |                  |
| <b>Male (%)</b>                             | <b>0.9310</b>                   | <b>0.870-0.997</b>  | <b>0.04</b>        |                  |
| Comorbidity Count (mean)                    | 0.9930                          | 0.977-1.008         | 0.34               |                  |
| <b>Concomitant Medications (mean)</b>       | <b>0.9010</b>                   | <b>0.888-0.914</b>  | <b>&lt;0.001</b>   |                  |
| Patient out-of-pocket per fill, \$          | 1.0000                          | 1.000-1.000         | 0.005              |                  |
| Insurance Type (compared to external plans) | <b>Medicaid</b>                 | <b>1.2760</b>       | <b>1.082-1.503</b> | <b>0.002</b>     |
|   | Medicare/Medicaid Dual Eligible | 1.1160              | 0.926-1.340        | 0.14             |
|   | <b>Commercial</b>               | <b>0.8480</b>       | <b>0.765-0.941</b> | <b>&lt;0.001</b> |
|   | <b>Non-Health Plan PBM</b>      | <b>0.8780</b>       | <b>0.795-0.971</b> | <b>&lt;0.001</b> |
|   | Medicare Advantage              | 1.0380              | 0.912-1.181        | 0.44             |
| Medicare Part D                             | 0.9240                          | 0.795-1.073         | 0.15               |                  |

**Table 3. Persistence Logistic Regression Analysis**

| Variable                                    | Odds Ratio                      | Confidence Interval | p-value            |                  |
|---|---------------------------------|---------------------|--------------------|------------------|
| <b>Mean age (years)</b>                     | <b>1.0090</b>                   | <b>1.007-1.012</b>  | <b>&lt;0.001</b>   |                  |
| Male (%)                                    | 1.0620                          | 0.994-1.136         | 0.077              |                  |
| Comorbidity Count (mean)                    | 1.0090                          | 0.994-1.024         | 0.26               |                  |
| <b>Concomitant Medications (mean)</b>       | <b>1.0350</b>                   | <b>1.022-1.048</b>  | <b>&lt;0.001</b>   |                  |
| Patient out-of-pocket per fill, \$          | 1.0000                          | 1.000-1.000         | 0.051              |                  |
| Insurance Type (compared to external plans) | Medicaid                        | 0.8990              | 0.761-1.063        | 0.07             |
|   | Medicare/Medicaid Dual Eligible | 0.9550              | 0.796-1.150        | 0.43             |
|   | <b>Commercial</b>               | <b>1.1770</b>       | <b>1.062-1.303</b> | <b>&lt;0.001</b> |
|   | <b>Non-Health Plan PBM</b>      | <b>1.1280</b>       | <b>1.021-1.245</b> | <b>&lt;0.001</b> |
|   | Medicare Advantage              | 0.9330              | 0.822-1.059        | 0.066            |
| Medicare Part D                             | 1.0180                          | 0.881-1.178         | 0.90               |                  |

## Discussion

Findings statistically significant and clinically meaningful:

- Increase in complexity of medication list, age, and being a male may decrease the likelihood of the patient remaining adherent to therapy. However, the same variables except for gender increases the likelihood of remaining persistent to therapy.
- Medicaid as payer type compared to external plans may increase the likelihood of the patient remaining adherent to therapy
- Commercial or non-health plan PBM as payer type compared to external plans can increase the likelihood of the patient remaining persistent to therapy

**Strengths:** large sample size, multiple logistic regression allows for accounting for potential important factors in one model

**Limitations:** limited to patients serviced by Optum Specialty Pharmacy, access to demographic data is limited, drug switch during study counted as separate subjects in regression analysis, and concomitant meds used surrogate marker of unique prescription numbers during period.

## Next Steps

- Leverage study results to identify what patients may benefit from more frequent clinical support via predictive analytics model
- Design intervention strategy and adjust clinical program design to proactively support patients at higher risk of poor adherence and/or persistence

## References

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## Disclosures / Contact

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