**Impact of comorbidities on medical costs in health plan members with multiple sclerosis**

Rachel Halpern,1* Steve Zhou,2 Mehul Jhaveri,2 Leigh Benton2

1OptumInsight, Eden Prairie, MN; 2Sanofi US, Bridgewater, NJ, UnitedHealthcare, Minneapolis, MN.

---

**OBJECTIVE**

To evaluate the impact of prevalent comorbidities reported by Meier et al. on medical costs in a commercially insured managed care population.

**METHODS**

**Study design and data source**

- Medicaid claims data, which identified patients with MS using administrative and pharmacy claims data, and enrollment information from a large national health plan.

**Study population**

- Including criteria:
  - Enrolled in the commercial health plan
  - Evidence of MS during the identification period: January 1, 2005, to July 31, 2006
  - A medical claim with a primary MS diagnosis (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] code 340.24) or an ICD-9-CM code during an inpatient stay or
  - A pharmacy claim for Medicare reimbursing medications.

- The index date was the first of the earliest claim, which was defined as any of the following:
  - A medical claim with a primary MS diagnosis during an inpatient stay
  - A pharmacy claim for Medicare reimbursing medications
  - Medical claim with a primary MS diagnosis within 90 days after a prior medical claim with a primary diagnosis
  - Continuous enrollment with medical and pharmacy benefits for 1 year prior to the index date
  - After the index date and within 6 months of the index date

**Statistical analysis**

**Descriptive analysis**

- Medical costs associated with MS and at least one comorbid condition were explored separately among patients with at least one MS-related diagnosis code (ICD-9-CM code 340.24) during the index period or, at least one comorbid condition during the post-index period.

**Measurement of comorbid conditions**

- MS-related medical costs were stratified and compared by ICD-9-CM code.

**Regression analysis**

- Non-MS-related medical costs for all patients were modeled using a generalized linear model (GLM) with gamma distribution based on non-parametric model.

**Conclusion**

- MS-related medical costs increased with increasing comorbidity burden.

---

**Table 1. Patient demographic and clinical characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Non-MS</th>
<th>MS only</th>
<th>MS + one comorbidity</th>
<th>MS + two comorbidities</th>
<th>MS + three or more comorbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>52.6 (13.8)</td>
<td>52.6 (13.8)</td>
<td>52.6 (13.8)</td>
<td>52.6 (13.8)</td>
<td>52.6 (13.8)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male: 51.2%</td>
<td>51.2%</td>
<td>51.2%</td>
<td>51.2%</td>
<td>51.2%</td>
</tr>
<tr>
<td>Race</td>
<td>White: 88.6%</td>
<td>88.6%</td>
<td>88.6%</td>
<td>88.6%</td>
<td>88.6%</td>
</tr>
</tbody>
</table>

**Figure 3. MS-related medical costs (2006 US dollars)**

- MS-related medical costs increased with increasing comorbidity burden.

**Conclusions**

- MS-related medical costs increased with increasing comorbidity burden.

---

**References**

1. Meier et al. 2. Halpern et al.