The cost burden of multiple sclerosis in the United States: A systematic review of the literature

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ABSTRACT

Objectives: To estimate average annual cost per multiple sclerosis (MS) patient in the US using published estimates from the literature.

Methods: A literature search was performed of English-language literature published between 2007 and June 2012 in PubMed and Embase using the term ‘multiple sclerosis’ and the subject heading ‘healthcare costs.’ The search strategy involved primary studies with MS cost figures that could be converted to per patient per year costs. Costs were inflated to 2011 dollars using the medical component of the Consumer Price Index.

Results: Fifteen studies met the inclusion criteria. Eight presented only direct cost breakdowns, and seven presented all cost breakdowns. Mean total, direct, and indirect costs were calculated.

Limitations: Data sources in these studies were dated, ranging from 1999 to 2012, and therefore do not include some of the newer, more costly therapies. In addition, this review does not include assessment of the decrements in quality of life associated with MS or costs associated with increasing levels of disability or early retirement. Furthermore, variations in study design, populations, methodologies, and cost inputs preclude more standardized reporting of aggregated (direct and indirect) costs.

Conclusions: MS is a costly chronic disease. Further research is needed to understand costs by MS-type, costs associated with increasing disability and early retirement. Variations in study design, populations, methodologies, and cost inputs make it difficult to confidently estimate the actual direct and indirect costs of MS, and at least partially account for the lack of correlation of costs with increasing levels of disability as well as early retirement have not been reported to date.

INTRODUCTION

There are four forms of MS: relapsing–remitting MS (RRMS), secondary progressive MS (SPMS), primary progressive MS (PPMS), and progressive-relapsing MS (PRMS).

- The most common type is RRMS, in which patients experience acute neurologic symptoms producing temporary disability [relapses] followed by periods of remission, or recovery, when acute symptoms subside and disability may or may not persist.
- This form can be preceded by clinically isolated syndromes, in which there has been only a single MS-type event, but the second event has been detected to confirm diagnosis. Most patients with RRMS will ultimately develop SPMS.
- PPMS manifests as a slow and steady increase in disability throughout the affected patient’s life, in the absence of acute relapses.
- MS is associated with high direct and indirect costs.
- Direct costs consist of medical expenditures, such as hospitalizations, inpatient and outpatient care, and pharmaceuticals.
- Indirect costs consist of those associated with short- and long-term disability, disease-related absence from work, workers’ compensation, and early retirement.
- The typical onset of symptoms associated with MS during a patient’s most productive working years presents huge potential societal costs associated with productivity loss.

- Disease-modifying therapies (DMTs) have been found to:
  - Reduce relapses in patients with MS and slow disability progression due to relapses with incomplete recovery.
  - Reduce the costs associated with MS disease relapses.
- The purpose of this study was to estimate the average annual cost per patient for MS in the US, including both direct and indirect costs, based on published economic studies.

METHODS

- A literature review was conducted by searching both PubMed and Embase using the search term ‘multiple sclerosis’ in conjunction with the medical subject heading ‘healthcare costs’ (where the search was limited to English-language studies published between January 1, 2007 and June 21, 2012).
- Figure 1 shows the number of articles identified during the systematic literature review, and details the reasons for exclusion of articles.
- Studies that reported direct and/or indirect costs for all MS cases (not broken down by disease type) were included in this analysis.
- Figure 2 shows the number of articles identified from the systematic literature review and the corresponding full journal publication.
- Table 1 contains detailed cost breakdowns for studies meeting the inclusion criteria.
- Calculation of the percentage of costs attributable to direct and indirect costs was based on studies that met these criteria, direct costs comprised 64–91% of total annual costs (average 77%) and indirect costs comprised 9–36% of total annual costs (average 23%).
- A total of 15 studies reporting total, direct, and indirect costs from 1999 to 2011 were identified.
- Eight presented only direct cost calculations; the remaining seven presented estimates of total cost, broken down into direct and indirect costs.
- Total all-cause healthcare costs for MS estimated from this literature review.

DISCUSSION

- The purpose of this analysis was to estimate the average annual cost burden per patient with MS in the US based on data from the most recent published literature.
- The studies included in this analysis, annual direct costs of approximately $16,000–34,000 and indirect costs under $20,000 per patient per year in 2011 dollars were estimated.
- Overall, the largest cost drivers of the disease were prescription drugs and indirect costs.

- Variations in study design, populations, methodologies, and cost inputs make it difficult to confidently estimate the actual direct and indirect costs of MS, and at least partially account for the lack of correlation of costs with increasing levels of disability as well as early retirement have not been reported to date.
- The data sources in these studies tended to be older, ranging from 1999 to 2012, and did not include some of the newer and more costly therapies, which could greatly increase direct and total costs.

- An ideal cost study would lay the groundwork to help providers and patients understand the potential impact of new MS treatments that have recently been approved and/or are expected to be launched over the coming years.

CONCLUSIONS

- MS is a costly chronic disease, with prescription drug costs and indirect costs being the largest cost drivers according to reports in the literature.
- Compared with a study ranking the direct costs of a number of chronic diseases, our analysis suggests that MS is the second most costly chronic condition after congestive heart failure.
- Ultimately, if new therapies could slow the progression of disability and decrease the number of relapses for patients, they would markedly reduce the cost burden of the disease.

REFERENCES


FIGURE 2. Breakdown of multiple sclerosis costs for articles identified during the systematic literature review.

FIGURE 3. Average direct multiple sclerosis costs compared with other costs associated with other chronic conditions. Adapted from Health Care Cost Institute, Chronic disease, comorbidity, and health risk factors in the US and Michigan.

FIGURE 4. Breakdown of all costs for articles identified during the systematic literature review.