

Hospital costs and length of stay trends in multiple sclerosis A retrospective analysis of 2001-2009 Nationwide Inpatient Sample data.

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Introduction

Information about costs of inpatient multiple sclerosis (MS) care is not readily available. Health care costs have increased by about 12% per annum in the last four years[1] and cost of an average family insurance was estimated at \$11,000 per year in 2006 [2]. This increase in costs can be attributed to rising costs of healthcare, practice of defensive medicine by physicians, increase in comorbid profiles among aging populations, and development of newer and more efficacious drugs. Multiple Sclerosis (MS) is a chronic disease that may lead to permanent disability. The increase in economic costs can also be attributed to loss of workforce and absenteeism, costs for building structured environment to provide support for disabled individuals and increases in the number of care providers. The annual cost of MS specialty drug therapies is projected to be around \$50,000 per person in next few years [3].

Objectives

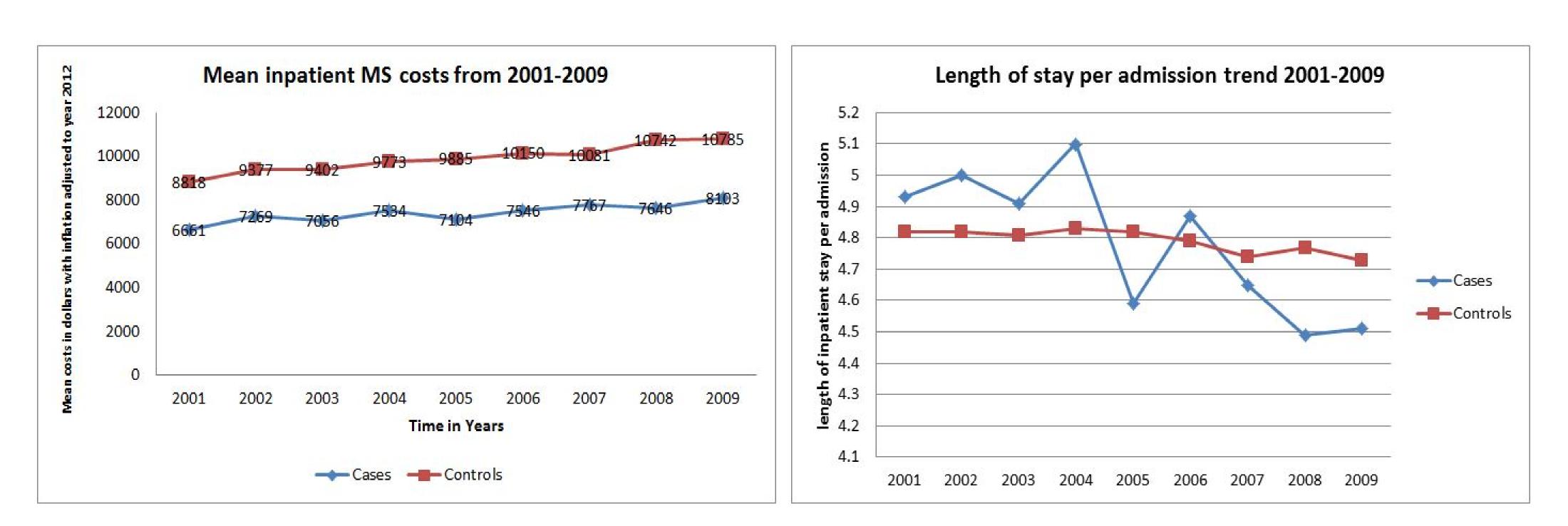
To characterize the trends in mean inpatient costs and the length of stay (LOS) among hospitalized MS patients.

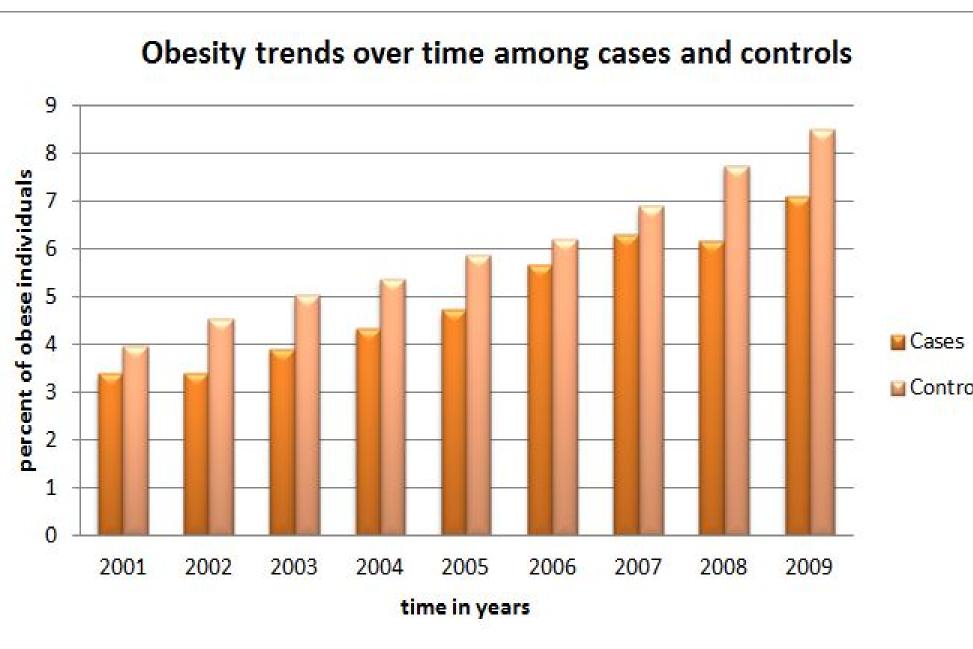
Materials & Methods

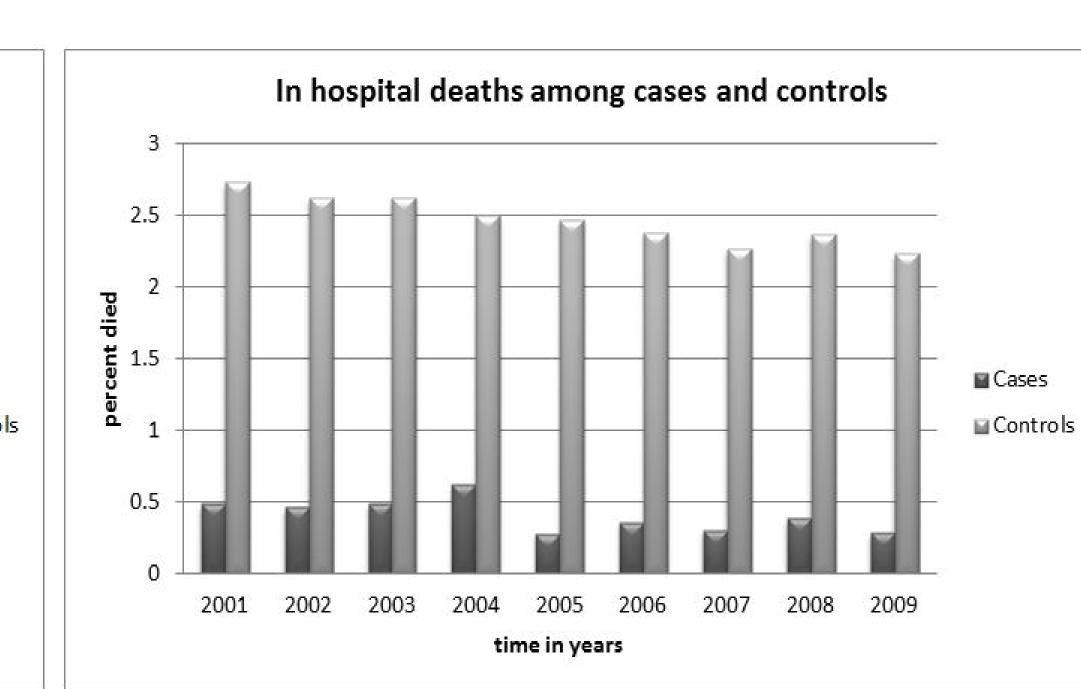
Healthcare Cost and Utilization Project (HCUP) [4] is a healthcare database developed through the federal-state-industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ). Nationwide Inpatient Sample (NIS) [5] is one of the several HCUP databases. It is the largest all-payer inpatient care database, publicly available in the United States and contains data from 5 to 8 million hospital stays from ~1,000 hospitals. NIS is a database of hospital inpatient stays. NIS can be used by policy makers and researchers to identify track and analyze trends in health care utilization, access, charges, quality and outcomes. The advantages of using the NIS data include: 1) Large sample size enables analyses of rare conditions, and special patient populations, such as the uninsured. 2) Hospital and discharge weights are provided for producing national estimates. 3) Data can be linked to the hospital-level (based on individual state regulations on the release of identifiers) Data were obtained from more than 40 states within the United States that contributed to the NIS.

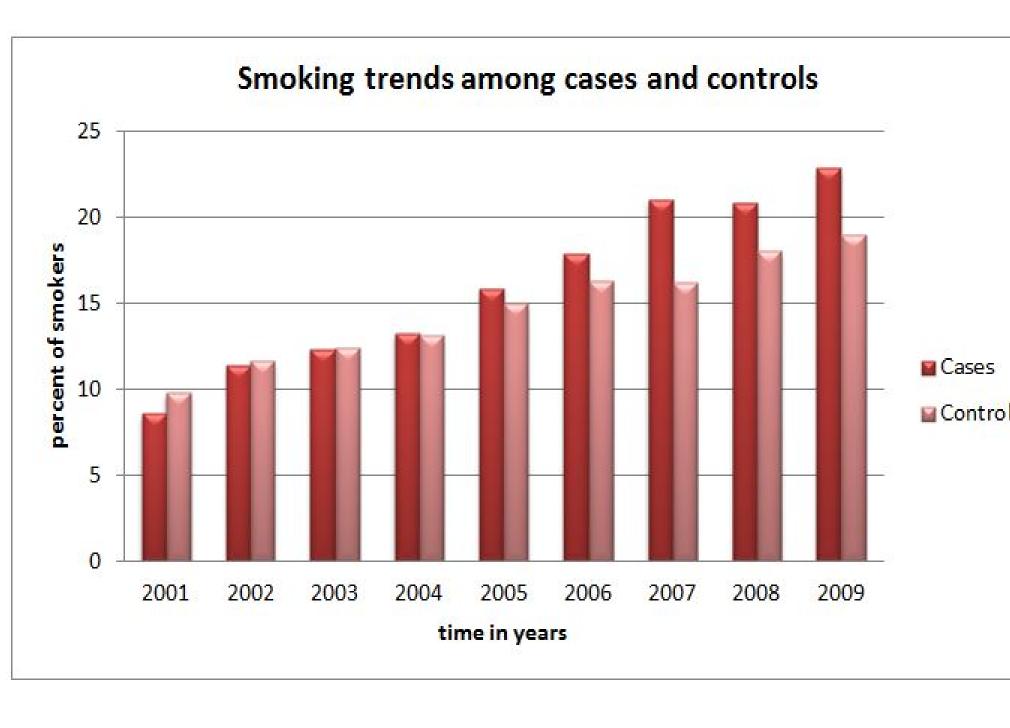
Using the 2001-2009 Nationwide Inpatient Sample (NIS) data, primary and secondary discharge diagnoses of MS of ages ≥ 18 years were queried. The discharges were based on Clinical Classification Software (CCS) [6] for International Classification of Disease Clinical Modification ninth edition (ICD-9 CM). Comorbidities queried were hypertension, diabetes, obesity, drug abuse, smoking, alcoholism and lipid disorders. Demographics and baseline information (payer and source of admission) is summarized for primary, and secondary MS discharges and controls. Continuous variables of age, cost, length of stay and number died are summarized by descriptive statistics (means and standard deviations). Categorical variables of gender, race and region are presented with frequency distributions (N %) for primary, secondary MS discharges and controls. Only primary MS discharges were considered when describing the trends to include hospitalizations specific to MS. Consumer Price Index (CPI) [7] inflation calculator was used to standardize all costs according to 2012 dollar rates and make comparisons of costs from 2001-2009.

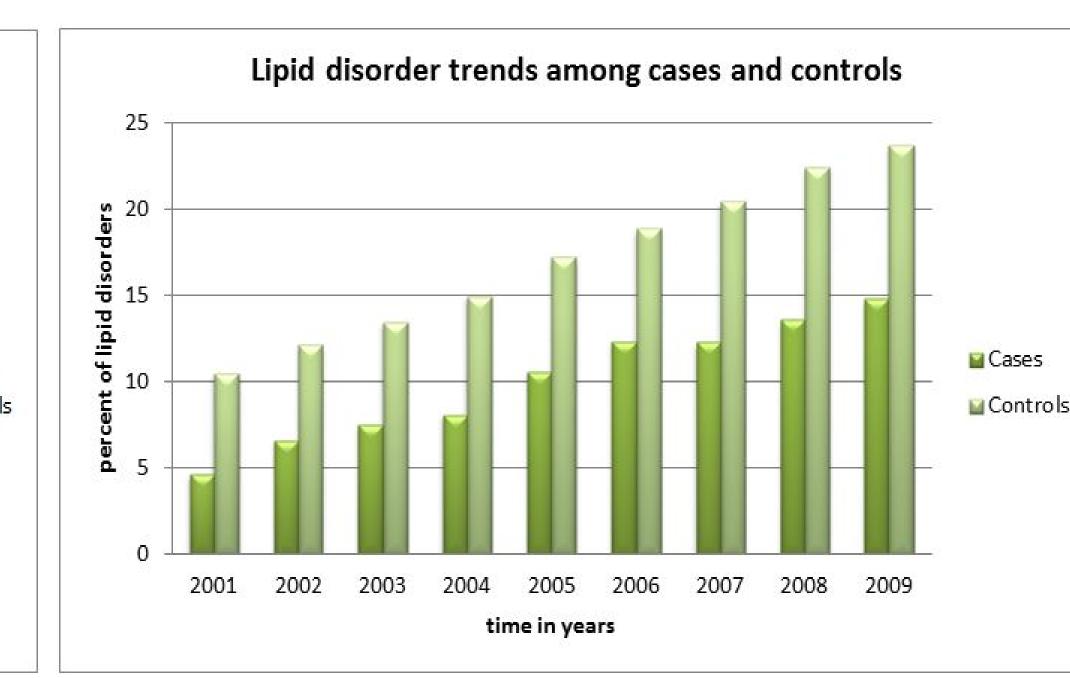
Results

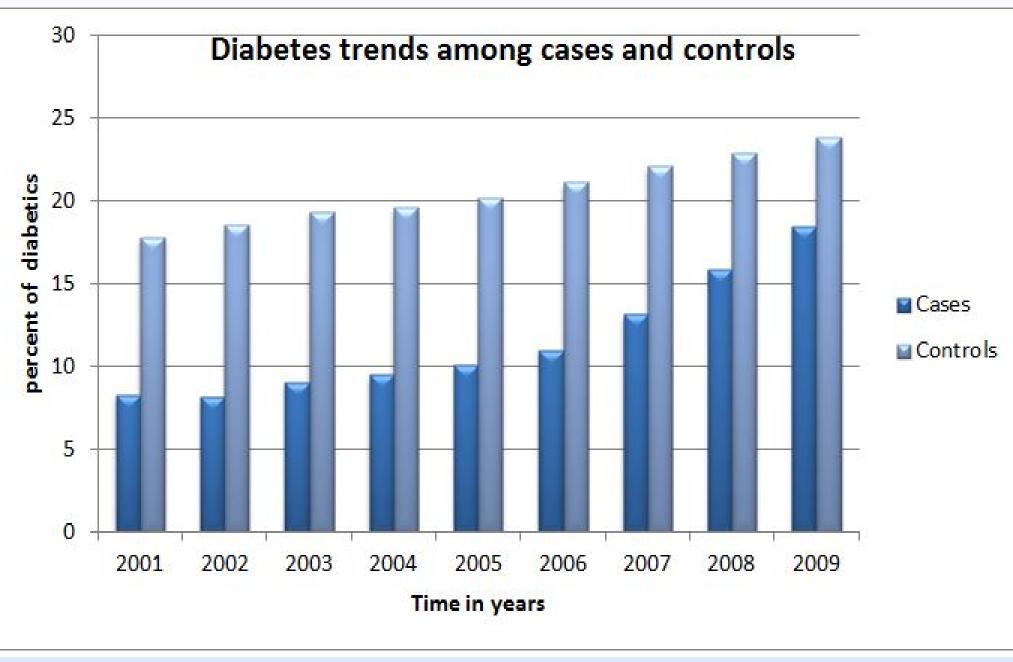


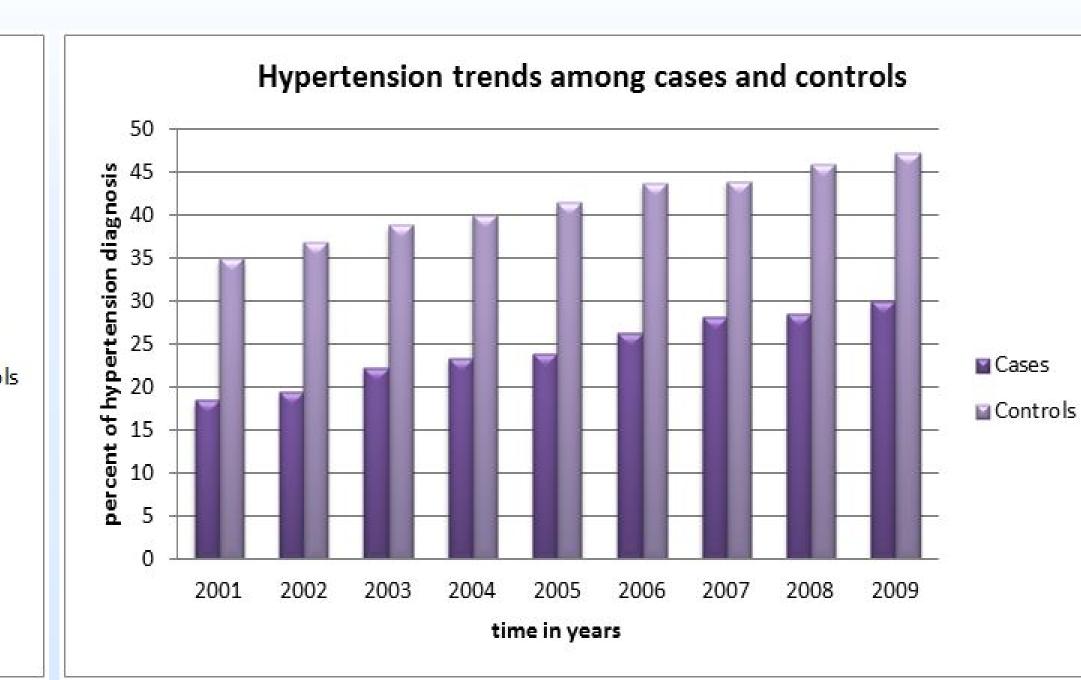












Results Cont...

The mean LOS in days (\pm SD) per discharge ranged from 4.49 (\pm 4.00) to 5.10 (\pm 9.98). LOS tended to decrease over time. The mean costs (\pm SD) per inpatient admission ranged from 6661 (\pm 11600) to 8103 (\pm 9940) from 2001-2009. The in hospital primary MS death rates decreased steadily from 0.48% in 2001 to 0.28% in 2009 except 2004 (0.62%). The rate of emergency admissions increased from 2001-2009. During the same period, contributions from Medicare increased while that of private insurance decreased. From 2001-2009, the prevalence of comorbid disorders with MS increased. Diabetes doubled (8.26% - 18.49%), lipid disorders tripled (4.61% - 14.79%), smoking doubled (8.54%- 22.85%), drug abuse doubled (1.49% - 3.90%) and obesity doubled (3.39% - 7.11%).

Discussion & Conclusions

The costs of inpatient MS care is increasing steadily. The LOS of inpatient MS care and the number of inpatient MS deaths decreased between 2001-2009 suggesting improved efficiency of care. One area of concern for clinicians and policy makers is the increase in costs per inpatient day. The steady increase in prevalence rates of comorbid disorders likely contributes to increasing inpatient costs. Increased emergency and urgent care admissions also may contribute to the growing costs. A recent retrospective claims data analysis also reported increased medical costs associated with the increased comorbidity burden [8]. These findings suggest implications for primary care physicians managing healthcare of persons with MS. The steady increase in inpatients costs along with increased specialty drug costs and other direct and indirect costs may require primary care physicians to focus their attention to more effectively managing chronic comorbid conditions among MS populations.

Limitations

Our data does not include or allow analysis of disease modifying therapies. The indirect costs of MS healthcare have not been accounted for in the data analysis. The data also does not allow analysis for the percent of each comorbid condition contributing to the total inpatient hospital stay costs. The database limits the identification of unique patient identifiers to account for multiple admissions.

References

- [1] The Henry J. Kaiser Family Foundation. Trends and Indicators in the Changing Health Care Marketplace. Publication number 7031. Available at: http://www.kff.org/insurance/7031/index.cfm. Accessed March 26, 2013.
- [2] The Henry J. Kaiser Family Foundation. Employer Health Benefits 2006 Annual Survey Publication number 7527. Available at: http://www.kff.org/insurance/7527/. Accessed March 26, 2013
- [3] PR Newswire. Multiple Sclerosis (MS) specialty drug treatment cost projected to exceed \$50,000 per person per year in 2016. Available at:http://www.prnewswire.com/news-releases/multiple-sclerosis-ms-specialty-drug-treatment-cost-projected-to-exceed-50000-per-person-per-year-in-2016-172651521.html. Accessed March 26, 2013.
- [4] HCUP Databases. Healthcare Cost and Utilization Project (HCUP). 2006-2009. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/databases.jsp, Accessed on March 26, 2013
- [5] HCUP Nationwide Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). 2007-2009. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed March 26, 2013
- [6] HCUP Clinical Classifications Software (CCS) for ICD-9-CM. Healthcare Cost and Utilization Project (HCUP). 2006-2009. Agency for Healthcare Research and Quality, Rockville, MD.www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed March 26, 2013.
- [7] Consumer Price Index (CPI). U.S. Bureau of Labor Statistics. http://www.bls.gov/cpi/#data. Accessed March26, 20123
- [8] Halpern R, Z. S., Jhaveri M, Borton L. Impact of Comorbidities on medical costs in health plan members with multiple sclerosis. Internal Journal of MS care, 2012. 14(2):p.65.