Health Policy Research Program
Summary of Research Results

Title:	**Effectiveness and Cost-Effectiveness of New Multiple Sclerosis Drugs in the 'Real World'**
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Project Completion Date:	**November 2004**
Research Category:	**Research**
Institution:	**Capital Health Nova Scotia and Dalhousie University**
Project Number:	**6795-15-2001/4410011**

Summary

Multiple Sclerosis - Canada's MS prevalence rate is among the highest in the world. MS is a chronic neurodegenerative disease with a heavy burden of illness and economic burden. Symptom onset is typically in the third decade of life. Relatively slow or rapid disability progression follows. Females are three times more likely than males to have MS. MS is a significant public health issue.

Costs - While drugs are now available that influence the natural history of MS, the cost of disease-modifying therapies is the largest component of total health care costs for persons with MS. Annual drug costs per person per treatment year ($14,000 to $19,000) are 7.5 to 9 times greater than all other Nova Scotia Department of Health costs incurred annually by persons with MS. This has important consequences when estimating the cost-effectiveness of new MS drugs that slow disability progression, because the difference between gross and net drug program costs, after deducting Department of Health care costs avoided, is likely small. If a broader cost perspective is used, e.g., all public sector costs, or all public and private sector costs, or societal costs that include lost productivity, then cost savings attributable to slower disability progression may be larger.

Effects - The Expanded Disability Status Scale (EDSS) is used worldwide to measure MS disability. It may also be used to construct an adequate "effect" measure for an economic evaluation (e.g., a cost-effectiveness analysis). This is important because economic evaluations are enhanced when health outcome measures reflect both quantity and quality of life effects. This study uses a MS-specific health outcome measure, EDSS disability-adjusted life years (DALYs) avoided, and a generic health outcome measure,

quality-adjusted life years (QALYs) gained. There are many methods for estimating QALYs. Among them, the Health Utility Index (HUI) seems the best for MS patients. The EDSS – HUI relationship we have found enables us to conduct high quality economic evaluations using routinely collected clinical data.

Cost-effectiveness - Post-marketing (Phase IV) assessments of safety, effectiveness and the cost-effectiveness of drug therapies check whether original assessments (upon which policy may have been made) hold up. Preliminary analyses of 1979 – 2004 Nova Scotia 'real world' data, using regression methods on person-level clinic-visit data, suggest that new MS drugs may be effective in delaying progression in the short-term. Health outcomes are modest, however, because MS disability progression is typically slow. Separate effectiveness estimates are made for MS subgroups with distinct disability progression paths. Preliminary cost-effectiveness ratio estimates for short-term therapy are comparatively high, reflecting high annual drug therapy costs, modest short-term health benefits and a narrow Department of Health cost perspective. Cost-effectiveness estimates for long-term therapy will likely be more favourable, since health outcomes and costs avoided appear to increase disproportionately with treatment duration. Estimates based on a broad societal cost perspective will also be more favourable.

This study has demonstrated the feasibility of using regression methods to estimate effectiveness and cost-effectiveness using 'real world' person-level longitudinal data.

Estimated cost-effectiveness ratios are 'high' or 'low' relative to a decision maker's willingness-to-pay. Cost-effectiveness study results inform evidence-based debates about choices.

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- The print version of the full report can be obtained in the language of submission from the Health Canada Library through inter-library loan.
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