Better access to outpatient magnetic resonance imaging in Ontario, but for whom?

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**ABSTRACT**

**Background:** Ontario has recently made considerable investments to improve access to magnetic resonance imaging (MRI) services. We hypothesized that this has been associated with a widening of previously existing disparities in MRI utilization according to socioeconomic status.

**Methods:** Analysis of all Ontario Health Insurance Plan claims for outpatient MRI scans performed between April 1, 2002 and March 31,2007. Age- and sex-standardized rates of MRI utilization were determined using Statistics Canada population and income data.

**Results:** Over the five-year period, the annual age- and sex-adjusted rate of MRI scanning increased from 1,511/100,000 to 2,976/100,000 (97% increase). In 2002, individuals living in neighbourhoods in the wealthiest quintile were 25% more likely to receive an MRI than individuals living in neighbourhoods in the poorest quintile (age- and sex-adjusted rates of MRI scanning of 1,702/100,000 versus 1,358/100,000). Despite this, the most marked increases in rates of MRI scanning in the subsequent five years were seen among those living in the highest income neighbourhoods (increases of 83%, 87%, 95%, 112% and 102% for the lowest to highest neighbourhood income quintiles, respectively), so that by 2007, those in the highest quintile neighbourhoods were 38% more likely to receive an MRI than those in the lowest quintile neighbourhoods.

**Conclusions:** Even in jurisdictions with universal health insurance, decision-makers should be aware that efforts to increase capacity may exacerbate disparities in access according to socioeconomic status. This underscores the need for simultaneous initiatives that strive to improve the appropriateness of health services utilization.

**INTRODUCTION**

In the face of concerns raised by citizens about long waits for health services,1,2 federal and provincial governments in Canada made reducing wait times for key health services—including magnetic resonance imaging (MRI) scanning—a priority.3 Under Ontario’s Wait Times Strategy, launched November 17, 2004, Ontario has seen considerable investments of $97 million in incremental operational funding for MRI scans and $21 million in funding for MRI equipment (personal communication, Steven Johansen, 2008).

Previous work has shown that, despite Canada’s system of universal health insurance, there is greater use of some health services (including MRI scanning) among higher income groups and that these differences are unlikely to be explained by differences in medical need alone.4-7 We conducted a population-based analysis to determine whether recent investments in MRI scanning in Ontario have led to a widening of previously documented disparities in outpatient MRI use according to socioeconomic status.

**METHODS**

We identified all Ontario Health Insurance Plan claims for MRI scans performed between April 1, 2002 and March 31, 2007.8 Inpatient MRI exams were excluded since they are covered through hospital global budgets. Only one body part-specific scan per patient per day was counted. Neighbourhood income at the census dissemination area level was used as a proxy for the personal income of patients receiving MRI scans and was determined by linking patients’ postal code of residence to the Statistics Canada Postal Code Conversion File. MRI scanning rates (for Ontario and within each neighbourhood income quintile) were determined using Statistics Canada population and income data, were age- and sex-adjusted using direct standardization to Ontario’s 2001 population, and are expressed as the number of MRI scans per 100,000 population. This study was approved by the Sunnybrook Health Sciences Research Ethics Board.

**RESULTS**

In Ontario, from fiscal years 2002/03 to 2006/07, there were substantial increases in the volume of MRI scans (183,729 to 389,261 scans; 112% increase) and in age- and sex-adjusted population rates of MRI scanning (1,511/100,000 to 2,976/100,000; 97% increase). In 2002/03, the rate of scanning among individuals living in the wealthiest quintile neighbourhoods was 25% greater than for individuals residing in the poorest quintile neighbourhoods (age- and sex-adjusted rates of 1,702/100,000 versus 1,358/100,000). Despite this, the greatest increases in MRI scanning rates over the next five years were seen among those living in the highest income neighbourhoods (increase of 83%, 87%, 95%, 112% and 102% for the lowest to highest neighbourhood income quintiles, respectively; Figure). Thus, by 2006/07, the difference in MRI rates between individuals living in the wealthiest and poorest quintile neighbourhoods had risen to 38%.

**DISCUSSION**

We found that recent efforts to improve capacity for MRI scanning in Ontario have been successful, with a doubling in MRI utilization over five years, but that utilization increased disproportionately for those living in the richest neighbourhoods. Although the relative roles of public versus private financing of healthcare in Canada remain hotly debated, many Canadians identify strongly with their healthcare system whose mandate is to provide access to care based on medical need and not on ability to pay.9 While we did not adjust for patient level clinical characteristics, it seems unlikely that the disparities we observed can be explained solely by differences in medical need since poorer individuals would be expected, on average, to have a greater burden of disease.

We suspect that individuals with higher socioeconomic status may be more likely to ask their physicians for an MRI scan and may be more adept at navigating the health system to gain access to the health services they desire.7,10 Others have found that physicians have negative perceptions of patients of lower socioeconomic status across several domains,11,12 and that physicians are more likely to order a diagnostic test in wealthier patients13.

Our analysis has some limitations. We did not have data regarding income at the household or individual level; therefore, some misclassification may have occurred. However, our finding of greater health services utilization among higher income groups is consistent with the published literature. Also, we did not have information about which clinical indications were driving the increase in MRI use, or the clinical characteristics of patients receiving the MRI scans. However, most diseases occur more frequently in individuals of lower socioeconomic status and so we would expect disease burden to be highest in the low income neighbourhoods.

In conclusion, even in jurisdictions with universal health insurance, decision-makers should be aware that efforts to increase capacity may have the unintended consequence of exacerbating disparities in access according to socioeconomic status. Our findings underscore the need for simultaneous initiatives that aim to target new services to those in greatest need and that strive to improve the appropriateness of health services utilization.

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**FIGURE LEGEND**

**Figure. MRI utilization in Ontario by neighbourhood income, 2002/03 to 2006/07**

Q1 to Q5 denotes neighbourhood income quintiles, with Q1 representing the lowest income neighbourhoods and Q5 the highest income neighbourhoods. (Neighbourhood = Statistics Canada census dissemination area).

