

# How Busy Are Private MRI Centres in Canada?

## Taux d'activité des centres privés d'IRM au Canada



by EDUARD BERCOVICI, MD, MSC  
*Faculty of Medicine*  
*University of Toronto*  
*Toronto, ON*

CHAIM M. BELL, MD, PHD  
*Faculty of Medicine*  
*Departments of Medicine and Health Policy, Management & Evaluation*  
*University of Toronto*  
*Institute for Clinical Evaluative Sciences*  
*Department of Medicine and Keenan Research Centre*  
*Li Ka Shing Knowledge Institute, St. Michael's Hospital*  
*Toronto, ON*

### Abstract

*Background:* Long waits for publicly funded magnetic resonance imaging (MRI) services have spurred the opening of private MRI centres in Canada. Little is known about the number and utilization of these facilities.

*Methods:* The authors surveyed all 17 private and 69 of 73 public English-speaking MRI centres in Canada in 2006, using hours of operation and waits for an elective MRI as surrogate measures of procedure volume and facility capacity.

*Results:* Public MRIs had more hours of operation on weekdays (14.7 vs. 9.7,  $p < 0.001$ )

and weekends (11.8 vs. 8.2,  $p < 0.001$ ). Waits were longer in public vs. private MRI centres (13.6 vs. 0.5 weeks,  $p < 0.001$ ).

*Conclusions:* Private MRIs provided fewer hours of operation but shorter wait times compared to public centres. This finding suggests that private centres have unused capacity and relatively small procedure volumes, and provide a minority of studies.

## Résumé

*Contexte :* Les temps d'attente pour les services publics d'imagerie par résonance magnétique (IRM) ont stimulé l'ouverture de centres d'IRM privés au Canada. On connaît peu le nombre de centres privés ou leur taux d'utilisation.

*Méthodologie :* En 2006, les auteurs ont effectué un sondage auprès des 17 centres privés et auprès de 69 des 73 centres d'IRM publics anglophones au Canada. Ils ont employé les heures d'activité et les temps d'attente pour les IRM non urgentes comme mesures de substitution pour calculer le volume d'activité et la capacité des installations.

*Résultats :* On observe plus d'heures d'activité dans les centres d'IRM publics pendant les jours de semaine (14,7 par rapport à 9,7;  $p < 0,001$ ) et les fins de semaine (11,8 par rapport à 8,2;  $p < 0,001$ ). Les temps d'attente étaient plus longs dans les centres publics par rapport aux centres privés (13,6 par rapport à 0,5 semaines;  $p < 0,001$ ).

*Conclusions :* Comparé aux centres d'IRM publics, on observe dans les centres d'IRM privés moins d'heures d'activité, mais des temps d'attente plus courts. Ces résultats portent à croire qu'une partie de la capacité n'est pas employée dans les centres privés, que leur volume d'activité est relativement faible et qu'ils procèdent à une minorité d'examen.

---

**A**CCCESS TO TIMELY HEALTHCARE IS A CENTRAL ISSUE IN CANADA. IN 2002, the Romanow report stated that diagnostic imaging wait times were increasing at a high rate and patients were consulting newly formed private MRI clinics. Recently, the Federal Advisor on Wait Times released his final report (Postl 2006) highlighting the continuing issue of increasing wait times despite the injection of resources following the 2004 First Ministers' meeting. Indeed, the issue of wait times, the report concludes, cannot be determined independently of the rest of the healthcare system. Wait times for high-technology services continue to be lengthy despite enhanced federal funding (Romanow 2002; Esmail and Walker 2002). Long waits for MRI procedures have garnered particular attention because of the technology's broad clinical indications (Keller 2005; CIHI 2004; Ehman 2004a). Since MRIs are critically important in diagnosing many conditions that require superior image

resolution, the evidence that Canada has fewer MRI machines per capita than most developed countries is a potential concern for the public because of slower diagnostic time and reduced ability to monitor disease progression (Keller 2005; CIHI 2004; Ehman 2004a).

The increased demand for MRIs and relative lack of public funding has provided the incentive for private groups in many provinces throughout Canada to open MRI facilities (Fischer 2005; Brooks 1993, 1994; Moran 1994). The move to private MRI centres has been controversial because some feel it challenges our long-standing model of universal access and the public delivery of healthcare. Similarly, offering privately funded MRIs suggests that, in some respects, a two-tiered model may be emerging (Brooks 1994).

Many point to the increased utilization of private MRI centres as justification for the relaxation of government controls on private medicine (Pinker 2000; CBC News 2002). However, as compared to the detailed information on public MRI services, relatively little is known about the utilization of private MRI facilities (Pindera 2004). One of the main reasons is that there is no single governing body, whether provincial or federal, that regulates the delivery of private healthcare. Estimating the extent and volume of privately delivered MRIs is central to understanding the magnitude and future impact of this technology on our public healthcare system. Therefore, the main goals of the current investigation involved surveying public and private MRI facilities to determine (a) hours of operation, a measure that would serve as a surrogate for procedure volume, and (b) estimated wait time for a standard elective MRI study.

## Methods

All English-speaking MRI centres in Canada were surveyed by telephone between January and September 2006. Lists of public MRI centres were obtained from the Canadian Institute for Health Information (CIHI 2004) and the Canadian Coordinating Office for Health Technology Assessment (now the Canadian Agency for Drugs and Technologies in Health) (CCOHTA 2001). Private MRI centres were identified via Internet and local business searches, as well as inquiries at neighbouring public facilities. We defined private MRI facilities as those that require payments distinct from government or other publicly insured bodies to provide medically necessary services (Madore 2005; Health Canada 2004).

We performed standardized scenario-based surveys of public and private MRIs. During the first part of the survey, we asked about hours of weekend and weekday operation for the MRI facilities. Hours of operation were then grouped according to business hours (Monday to Friday, 8 a.m. to 5 p.m.), after-hours (Monday to Friday, 5 p.m. to 8 a.m.) or weekend hours (Friday 5 p.m. to Monday 8 a.m.) (Churchill et al. 2003; Feeney et al. 2005). During the second part of the survey, average wait times

(in weeks) were elicited to provide additional information on the facility's capacity. We used a standardized scenario for an elective MRI of the knee in order to minimize bias, because our earlier pilot testing demonstrated that all MRI centres questioned could perform MRIs of this body part as compared to limitations posed by other body sites, such as the spine or brain.

All data are presented as mean values. Data pertaining to proportions of MRIs open at certain times were analyzed using chi-square tests. Differences in daily and weekly hours of operation and mean wait times between public and private MRI centres were analyzed with the Mann–Whitney–Wilcoxon non-parametric test. We theorized that private facilities would be responsive to patient demand and add additional hours of operation if they were working at capacity during business hours. To examine this hypothesis, we investigated the relationship between the total time per day that MRIs operated and average wait time for that facility. This relationship was obtained using Spearman rank order correlations ( $r$  and  $r^2$ ) between hours of operation and average wait times. Specifically, the  $r^2$  value would delineate the proportion of average wait times that could be explained by variation in hours of operation. Estimates of hours of operation for non-responding facilities were extrapolated from mean values. For all statistical analyses, significance was set at  $p < 0.05$ . The research protocols were approved by the St. Michael's Hospital Research Ethics Board.

## Results

Complete information was obtained from all of the 17 identified private MRI centres in six provinces (100%) and 69 of 73 (94.5%) of the public MRI centres in nine provinces. The private MRIs were located in Ontario, Quebec, Nova Scotia, Alberta, Manitoba and British Columbia. Most MRI centres were located in urban centres and close to major hospitals. Hours of operation were obtained for 72 of 73 (99%) public MRI centres. Public MRIs were open longer during weekdays (14.7 vs. 9.7 hours,  $p < 0.001$ ) and weekend days (11.8 vs. 8.2 hours,  $p < 0.001$ ) (Figure 1). Comparing the average hours of operation for all 17 private facilities and the hours of operation for all 73 public facilities allowed us to estimate the overall system capacity. In total, 6,563 (86%) hours of operation per week could be provided by public MRIs compared to 1,103 (14%) hours for private MRIs if both systems ran at equal capacity.

Of the total MRI centres in Canada, 93% of the public centres offered non-business hours appointments compared to only 53% within the private sector. MRIs that were open exclusively during business hours comprised 47% of private facilities but only 8% of public centres. Similarly, 64% of public MRIs offered weekend appointments compared to only 12% of the private MRI facilities ( $p < 0.001$ ) (Figure 2).

## How Busy are Private MRI Centres in Canada?

Wait times were longer in public centres compared to private MRI centres (13.6 vs. 0.5 weeks,  $p < 0.001$ ) (Figure 3). Publicly funded MRI centres offering only business hours had significantly longer wait times compared to private MRI centres (14.4 vs. 0.4 weeks,  $p < 0.01$ ) (Table 1). Similarly, wait times were markedly higher in public centres offering after-hours (13.5 vs. 0.8 weeks,  $p < 0.001$ ) and weekend appointments (12.1 vs. 0.6 weeks,  $p < 0.05$ ) compared to private MRI centres.

FIGURE 1. Total number of hours that MRI centres are open each day

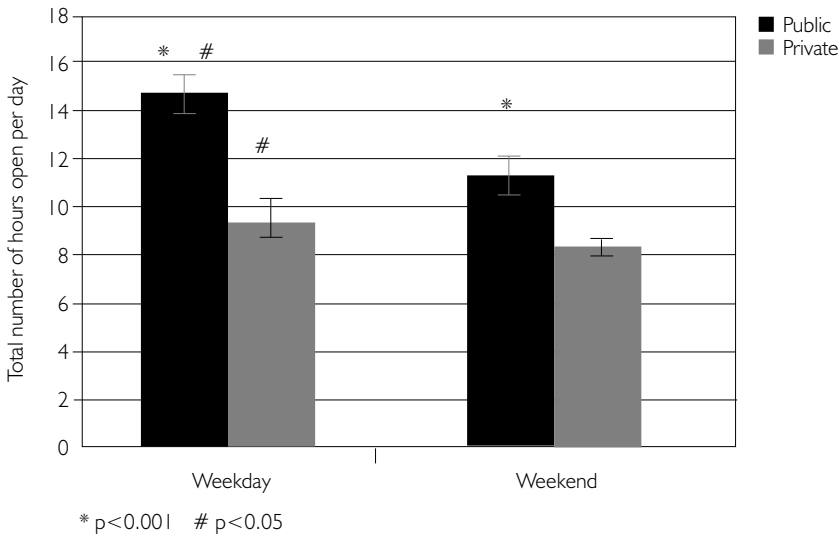
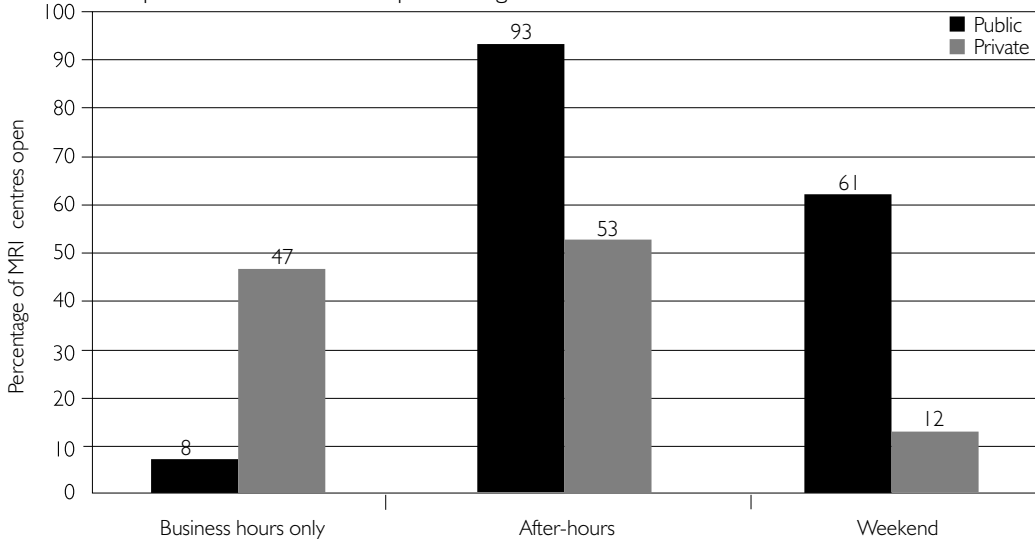


FIGURE 2. Proportion of MRI centres open during the week\*



\* Clinics are counted more than once if they offer both after-hours and weekend appointments.

FIGURE 3. Mean wait times in public- and private-funded MRI centres

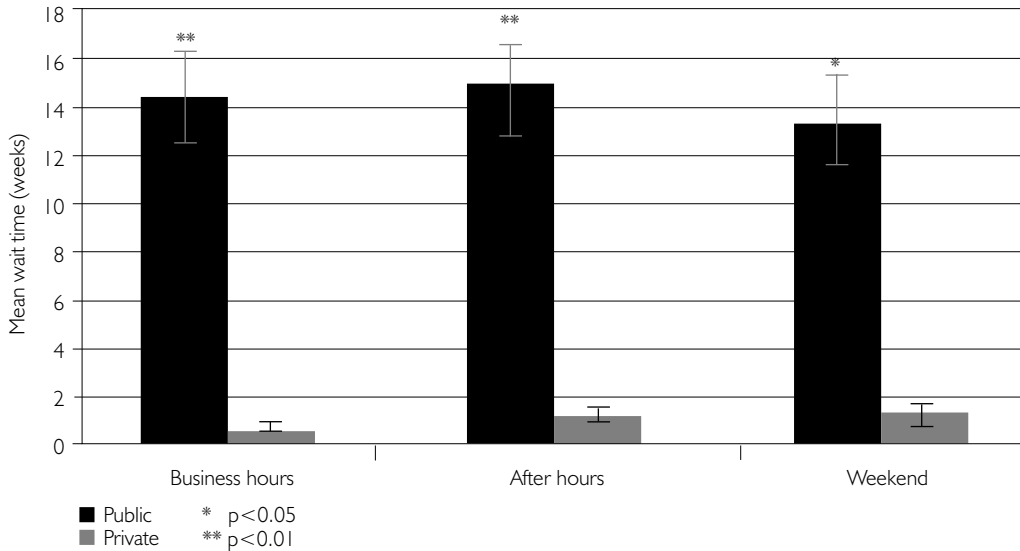


TABLE 1. Hours of operation and wait times for public and private MRI clinics

Hours of operation*		Number of facilities†	Mean wait (weeks) (SD)	Median wait (weeks)
Business hours only	Public	4	14.4 (4.0)	15
	Private	8	0.4 (0.25)	0.3
After-hours	Public	65	13.5 (11.0)	11.3
	Private	7	0.8 (0.63)	0.4
Weekend	Public	41	12.1 (10.1)	10.7
	Private	2	0.6 (0.51)	0.6

\* Hours of operation grouped by:

Business hours only (Monday to Friday, 8 a.m.– 5 p.m.)

After-hours (Monday to Friday, 5 p.m.– 8 a.m.)

Weekend hours (Friday 5 p.m. to Monday 8 a.m.)

† Facilities could be counted more than once in the after-hours and weekend categories, depending on their hours of operation.

SD – standard deviation

Correlation coefficients were computed to compare associations between the total hours of operation and mean wait times. For public MRI facilities, there was a significant negative correlation between hours of operation and wait time (i.e., longer hours of operation were associated with shorter wait times ( $r = -0.289$ ,  $r^2 = 0.083$ ,  $p < 0.05$ )). However, the correlations between hours of operation and mean wait time were not significant in the subsets of public MRI centres that offered business hours only ( $r = -0.258$ ,  $r^2 = 0.067$ ,  $p > 0.05$ ) or after-hours diagnostic scans ( $r = -0.277$ ,  $r^2 = 0.076$ ,  $p > 0.05$ ). No significant correlations between hours of operation and wait times were

found among the private MRI facilities for all clinics ( $r=0.337$ ,  $r^2=0.113$ ,  $p>0.05$ ), for clinics providing after-hours MRI scans ( $r=0.323$ ,  $r^2=0.104$ ,  $p>0.05$ ) or for those offering scans only during business hours ( $r=0.252$ ,  $r^2=0.063$ ,  $p>0.05$ ).

## Interpretation

We contacted what we believe to be all private MRI facilities in Canada. We found that they have significantly fewer hours of operation, limited (if any) weekend appointment times and little (if any) waits for tests compared to public centres. These findings suggest that private MRIs in Canada have relatively small volumes and provide a minority of all MRI studies.

We believe our cross-sectional estimates are robust because they compare with government-collected data for the public facilities for the same time period (OMHLTC 2007; Alberta Health & Wellness 2008; Manitoba Health n.d.). Given that there should be little variation in the number of studies performed per hour at each facility, our results of hours of operation per week provide a reasonable estimate of potential procedure volume. The findings are further strengthened by the survey's high response rate. Still, studies with more direct volume measures would likely provide improved accuracy.

How are the private clinics different from their public-sector counterparts? Based on our data, it is apparent that public MRI centres offer longer hours of operation and concomitantly longer wait times compared to private facilities. However, our correlational findings demonstrate that among public MRI centres there is a negative but small association between hours of operation and wait times, i.e., longer hours of operation, shorter wait times. However, analyses of subsets of public MRI centres demonstrated no significant correlation among either centres that offered only business-hours service or those that offered after-hours service. Further, no significant correlations between hours of operation and wait times were observed among the private facilities. This finding could reflect the overall short waits, small numbers of facilities and similar hours of operation for private MRIs. However, private centres appear to have additional capacity to respond to increased demand by increasing hours of operation.

The issue of how accessible private MRI facilities are to patients is also of interest, both to policy makers and to the general public. Indeed, our data highlight the fact that public facilities provide more after-hours and weekend care than private MRIs. However, our findings were predicated on an elective scenario. We did not use a scenario that describes a more urgent diagnostic indication (such as symptomatic brain cancer) because these are usually considered higher-priority studies and are triaged by radiologists. We specifically chose to investigate elective MRIs because they are more frequently encountered than urgent ones and are easier to correlate with wait times. Thus, we cannot comment on issues regarding a different case mix of patients.

Whether private facilities have the capacity or ability to provide quick responses for urgent or emergent care was not considered.

Our study has limitations that merit mention. The results are cross-sectional and survey-based. Therefore, they rely on accurate information from respondents. This may be more of an issue with estimates of wait times compared to hours of operation. As well, we may have missed some private and non-English-speaking public MRI facilities. However, the sites and numbers of private MRIs are similar to those reported in other studies (Madore 2005; Health Canada 2004; Lambert 2006). Therefore, any biases are small and unlikely to account for the large observed differences. It is important to note that we used a standardized scenario to question each public and private facility to minimize selection and responder bias. Hence, our scenario may not capture the true wait time because we acted as a patient requesting an appointment and did not formally obtain an appointment with radiologist approval. Finally, our findings likely overestimate private MRI volume because we found significantly shorter procedure waits at private facilities, thereby implying unused capacity. Further investigations are needed to determine whether the volumes per unit of time are comparable between public and private sites.

The information from this study has implications for health system management. First, policy makers should note that privately funded and delivered MRIs are now established in many provinces as an alternative to the publicly funded ones. Thus, our healthcare system needs to find ways to record the care received at private centres. For example, our difficulties in obtaining objective data about the number and location of these facilities highlights an important deficit in the registration of privately funded health delivery modules such as MRIs. Data systems covering private centres would allow wait time strategists to make objective comparisons between public and private MRI centres, for example, in determining whether current wait time reduction policies have an impact. Second, our results suggest that the volume in private MRI centres may be significantly less than that of their public counterparts. If this inference is correct, then wait times within the public MRI centres could potentially be reduced if cases were contracted out to the private MRI centres. That is, by purchasing time slots from private MRIs, non-urgent and elective MRI cases could potentially be performed in one of the private centres, thereby reducing wait times and complications due to long waits.

The status and future role of private MRIs is a topic that should be debated among policy makers and the public (Madore 2005). Our study indicates that private MRI centres are functioning well below capacity and account for at most 14% of studies performed in Canada. However, future private MRI facilities are planned, and others have been purchased and converted to public facilities (Ehman 2004b; Pindera 2005; Lambert 2006).



At this time, it is uncertain how or even whether the market share of private MRI centres is changing, and whether they pose a clear and present danger to the public delivery of MRI services in Canada.

#### ACKNOWLEDGEMENTS

Dr. Bell is the recipient of a Canadian Institutes of Health Research/Institute of Aging New Investigator Award. The funding agencies had no role in the design and conduct of the study; collection, management, analysis or interpretation of the data; or preparation, review or approval of the manuscript. The corresponding author had full access to all data in the study and takes responsibility for both the integrity of the data and the accuracy of the data analysis.

Correspondence may be directed to: Dr. Chaim Bell, MD, PhD, St. Michael's Hospital, 30 Bond St., Toronto, ON M5B 1W8; tel.: 416-864-6060, ext. 2373; e-mail: bellc@smh.toronto.on.ca.

#### REFERENCES

- Alberta Health & Wellness. 2008. *Alberta Waitlist Registry*. "Trend Reports." Retrieved September 28, 2008. <<http://www.ahw.gov.ab.ca/waitlist/TrendReports.jsp?rcatID=18&rhaID=All&doSearch=true>>.
- Brooks, J. 1993. "Canada's First Private MRI Clinic: Does It Signal a Shift to Two-Tiered Medicine?" *Canadian Medical Association Journal* 149: 1155–58.
- Brooks, J. 1994. "Alberta's Private MRI Clinics One Sign of Move Away from Cash-Free Medical Care." *Canadian Medical Association Journal* 151: 647–48.
- Canadian Coordinating Office for Health Technology Assessment (CCOHTA). 2001 (July 15). "Magnetic Resonance Imaging Scanners in Canadian Hospitals." Retrieved September 28, 2008. <[http://cadth.ca/media/pdf/mri\\_report\\_01.pdf](http://cadth.ca/media/pdf/mri_report_01.pdf)>.
- Canadian Institute for Health Information (CIHI). 2004. *Medical Imaging in Canada*. Retrieved September 28, 2008. <[http://secure.cihi.ca/cihiweb/dispPage.jsp?cw\\_page=PG\\_328\\_E&cw\\_topic=328&cw\\_rel=AR\\_1043\\_E](http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=PG_328_E&cw_topic=328&cw_rel=AR_1043_E)>.
- CBC News. 2002. "Private MRI Clinic Opens amidst Protests." Retrieved January 31, 2007. <[http://www.cbc.ca/canada/nova-scotia/story/2002/08/01/ns\\_mridump020801.html](http://www.cbc.ca/canada/nova-scotia/story/2002/08/01/ns_mridump020801.html)>.
- Churchill, A.J., C. Gibbon, S. Anand and M. McKibbin. 2003. "Public Opinion on Weekend and Evening Outpatient Clinics." *British Journal of Ophthalmology* 87: 257–58.
- Ehman, A.J. 2004a. "Saskatchewan's 22-Month Wait for an MRI Is 'Almost Criminal,' Says Radiologists' Association." *Canadian Medical Association Journal* 170: 776.
- Ehman, A.J. 2004b. "Prairie First Nations Groups Planning 8 Private MRI Clinics." *Canadian Medical Association Journal* 171: 437.

- Esmail, N. and M. Walker. 2002. *Waiting Your Turn: Hospital Waiting Lists in Canada* (17th ed.). The Fraser Institute. Retrieved September 28, 2008. <[http://www.fraserinstitute.org/Commerce/Web/publication\\_details.aspx?pubID=4962](http://www.fraserinstitute.org/Commerce/Web/publication_details.aspx?pubID=4962)>.
- Feeney, C.L., N.J. Roberts and M.R. Partridge. 2005. "Do Medical Outpatients Want 'Out of Hours' Clinics?" *BMC Health Services Research* 5: 47. Retrieved September 28, 2008. <<http://www.biomedcentral.com/1472-6963/5/47>>.
- Fischer, D. 2005. "Expert Laments Lack of Private Health Care Debate." CanWest News Service. Retrieved September 28, 2008. <[http://www.canada.com/national/features/decisioncanada/story\\_05.html?id=e6d65de3-b275-4d13-992e-3639393cc3c2](http://www.canada.com/national/features/decisioncanada/story_05.html?id=e6d65de3-b275-4d13-992e-3639393cc3c2)>.
- Health Canada. 2004. *Canada Health Act Annual Report 2003–2004*. Retrieved September 28, 2008. <[http://www.hc-sc.gc.ca/hcs-sss/alt\\_formats/hpb-dgpps/pdf/pubs/cha-lcs-ar-ra/2003-04\\_e.pdf](http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgpps/pdf/pubs/cha-lcs-ar-ra/2003-04_e.pdf)>.
- Keller, A. 2005 (April). *MRI and CT Expert Panel Phase I Report* (pp. 8–25). Retrieved September 28, 2008. <[http://www.health.gov.on.ca/transformation/wait\\_times/wt\\_reports/mri\\_ct.pdf](http://www.health.gov.on.ca/transformation/wait_times/wt_reports/mri_ct.pdf)>.
- Lambert, S. 2006. "Deal Reached to End Dispute over Private Health Care in Manitoba." Canadian Press. Retrieved September 28, 2008. <[http://aol.mediresource.com/channel\\_health\\_news\\_details.asp?news\\_id=11371&channel\\_id=131](http://aol.mediresource.com/channel_health_news_details.asp?news_id=11371&channel_id=131)>.
- Madore, O. 2005 (May 17). "Private Diagnostic Imaging Clinics and the *Canada Health Act*." Ottawa: Parliamentary Information and Research Service, Library of Parliament, PRB-05-02E. Retrieved September 28, 2008. <<http://dsp-psd.pwgsc.gc.ca/Collection-R/LoPBdP/PRB-e/PRB0502-e.pdf>>.
- Manitoba Health. n.d. *Manitoba Wait Time Information*. Retrieved September 28, 2008. <<http://www.gov.mb.ca/health/waitlist/diagnostic/mri.html>>.
- Moran, T. 1994. "Province's Former Health Minister Brings Private-Sector MRI to BC." *Canadian Medical Association Journal* 151: 645–46.
- Ontario Ministry of Health and Long-Term Care (OMHLTC). 2007 (December 11). *Ontario Wait Times*. Retrieved September 28, 2008. <[http://www.health.gov.on.ca/transformation/wait\\_times/wait\\_mn.html](http://www.health.gov.on.ca/transformation/wait_times/wait_mn.html)>.
- Pinker, S. 2000. "Private MRI Clinics Flourishing in Quebec." *Canadian Medical Association Journal* 163: 1326.
- Pindera, L. 2004. "For-Profit Clinics Are Legal But 'No Solution.'" *Canadian Medical Association Journal* 171: 1333.
- Pindera, L. 2005. "Increasing Private Delivery of Publicly Funded Services?" *Canadian Medical Association Journal* 175: 167.
- Postl, B. 2006 (June). *Final Report of the Federal Advisor on Wait Times*. Retrieved September 28, 2008. <[http://www.hc-sc.gc.ca/hcs-sss/alt\\_formats/hpb-dgpps/pdf/pubs/2006-wait-attente/index\\_e.pdf](http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgpps/pdf/pubs/2006-wait-attente/index_e.pdf)>.
- Romanow, R.J. 2002. *Building on Values: The Future of Health Care in Canada – Final Report*. Saskatoon: Commission on the Future of Health Care in Canada. Retrieved September 28, 2008. <[http://www.cbc.ca/healthcare/final\\_report.pdf](http://www.cbc.ca/healthcare/final_report.pdf)>.

## Call to Authors

Data Matters presents brief, focused papers that report analyses of health administrative or survey data that shed light on significant health services and policy issues. Submissions to Data Matters should be a maximum of 1,500 words, exclusive of abstract (max. 100 words), tables, figures and references, and should include no more than three tables or figures.

## Appel aux auteurs

« Questions de données » présente de brefs articles ciblés portant sur des analyses de données administratives ou d'enquêtes sur la santé ou de données d'enquête et qui font la lumière sur d'importantes questions liées aux services et aux politiques de santé. Les articles soumis à « Questions de données » doivent être d'au plus 1 500 mots, excluant le résumé (100 mots au plus), les tableaux, diagrammes et références et ne doivent pas comprendre plus de trois tableaux ou diagrammes.

For more information contact Ania Bogacka, Managing Editor, at [abogacka@longwoods.com](mailto:abogacka@longwoods.com).

Pour de plus amples renseignements, veuillez communiquer avec Ania Bogacka, Directrice de rédaction, à [abogacka@longwoods.com](mailto:abogacka@longwoods.com).



A journal with a distinguished history.

**W**ORLD HEALTH & POPULATION  
[www.worldhealthandpopulation.com](http://www.worldhealthandpopulation.com)