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DIRECTORATE FOR EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS
HEALTH COMMITTEE

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OECD Health Data National Correspondents

ASSESSING THE AVAILABILITY AND COMPARABILITY OF DATA ON THE USE OF SELECTED MEDICAL EQUIPMENT: REPORT ON A PROJECT FROM THE CANADIAN INSTITUTE FOR HEALTH INFORMATION

To be held on 9-10 October 2008
Starting at 14:30 on the first day and ending at 17:30 on the second day
At the OECD Conference Centre, 2 rue André Pascal, Paris 16ème arrondissement

This paper includes excerpts from a recent report from the Canadian Institute for Health Information (CIHI), entitled Medical Imaging in Canada, 2007. It reproduces the last section of Chapter 3 on "Utilisation of MRI and CT Technologies", which focusses on international comparisons. The full publication is available freely on the CIHI website (www.cihi.ca), at the following address:
http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=PG_877_E&cw_topic=877&cw_rel=AR_1043_E

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NOTE BY THE SECRETARIAT

1. Medical technologies make health care more effective, but add pressures on cost through both the fixed cost related to acquisition and maintenance and the variable cost related to their use. As it stands, *OECD Health Data* collects data on the availability of five diagnostic or therapeutic technologies: CT scanners, MRI units, mammography machines, radiotherapy equipment and lithotriptors. These data indicate that the number of machines has increased over time in most countries, although there remain large variations in their availability across countries.

2. The data collected thus far relate only to the availability of these medical equipments; they do not provide any information on the extent to which equipment is actually used. Hence, it is not possible to respond to the following questions based on the information presently available:

- To what extent has the increase in the supply of equipment been accompanied by a proportional increase in their utilisation?

- And is there any variation across countries in the extent to which the available equipment is being utilised (possibly indicating the potential to further increase utilisation rates in those countries where these are low)?

3. The OECD Health Committee's Draft Programme of Work for 2009-2010 includes an assessment of the possibilities to complement the data presently available on the availability of selected medical equipment with data on utilisation rates (DELSA/HEA(2008)10/PART1).

4. The purpose of this paper is to begin to implement this item of the Work Programme by sharing information on a recent initiative by the Canadian Institute for Health Information (CIHI) to collect and report data on certain measures of utilisation of MRI and CT scanners in a number of OECD countries (beyond Canada, these countries include the United States, England, Belgium, Denmark, Spain and Sweden). The main indicators of utilisation that appear to be available across this group of countries are the number of MRI or CT exams, per scanner and per capita.

5. National Correspondents for *OECD Health Data* are invited to:

- **COMMENT** on whether such data on the utilisation of MRI units, CT scanners and the other medical equipments collected under *OECD Health Data* might be available in their country, and if so, from what sources these data are derived.

Chapter 3, final section (from publication *Medical Imaging in Canada, 2007*, CIHI)

Utilization of MRI and CT Technologies

International Comparisons

While the chapter on supply of medical imaging technologies provides comparisons on number of scanners for quite a number of OECD countries for which data were available, this chapter on utilization compares indicators with only the U.S., England, Belgium, Denmark, Spain and Sweden because such indicators are less readily available in other countries.

Table 7 compares MRI and CT exams per 1,000 population, per scanner and per FTE diagnostic imaging technologist, as well as hours of operation of scanners per week, among the above mentioned countries for which indicators are available.

Table 7. Average Number of Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Exams per 1,000 Population, per Scanner, per FTE Technologist, and Average Number of Hours of Operation of Scanners per Week for Selected Countries, 2006–2007 or Latest Available Year

Country	Exams per 1,000 Population		Exams per Scanner		Exams per FTE		Hours of Operation per Scanner per Week	
	MRI	CT	MRI	CT	MRI	CT	MRI	CT
United States	88.9	207.4	3,460[a]	6,108[b]	1,175	1,960	69.1	58.0
England[c]	24.8	53.7	4,558	--	--	--	--	--
Belgium	43.0	138.3	6,584[d]/5,740[e]	5,772[f]/4,810[g]	--	--	--	--
Denmark	17.4	33.9	1,672	2,448	--	--	--	--
Spain	21.4	57.0	1,498	2,690	--	--	--	--
Sweden	38.9	88.9	3,500	5,000	--	--	--	--
Canada	**31.2**	**103.3**	**5,123**	**8,735**	**1,310[h]**	**3,062[h]**	**70.7**	**59.9**

Notes:

-- Not available.

a) Based on exams performed in hospital sites with fixed MRI scanners.

b) Based on the total number of CT exams and total number of fixed CT scanners. It is implicitly assumed that the 0.8% of sites (65 out of 7,650) using mobile scanners perform a negligible number of exams.

c) Includes exams in the public sector only for 2006-2007. For this reason, exams per 1,000 population cannot be directly compared with Canada.

d) Based on 68 approved MRI scanners in 2004 (Source: Ministry Public Health).

e) Based on 78 MRI scanners for clinical purposes in 2004 (Source: Survey Struyven, Consilium Radiologicum)

f) Based on approximately 250 CT scanners in 2004 (Source: Consilium Radiologicum)

g) Based on approximately 300 CT scanners in 2004 (Source: OECD and COCIR - European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry)

h) Rates of exams per FTE for Canada are for 2005-2006 and exclude Quebec.

Sources: U.S.: IMV, Medical Information Division, Benchmark MRI and CT Reports, 2006; **England:** KH12 returns, UK Department of Health, Hospital Activity Statistics, 2006–2007 for number of exams, and Communication with P.

White, Health Horizons, Ltd. for number of scanners; **Belgium, Denmark, Spain and Sweden:** Belgian Health Care Knowledge Centre (KCE); 2006. KCE reports 37C (D/2006/10.273/34).
Canada: National Survey of Selected Medical Imaging Equipment (2006 and 2007), Canadian Institute for Health Information; Canadian MIS Database (CMDB), 2005–2006.

Although the U.S. has more than four times as many MRI scanners per million population as Canada (see Figure 42), the number of MRI exams per 1,000 population performed in the U.S.[i] was just 2.9 times that in Canada.[2, 3] The number of MRI exams per scanner was 48.1% higher in Canada than in the U.S., explaining the smaller difference between the two countries in exams per 1,000 population than in scanners per million population. The number of MRI exams per FTE technologist was 11.5% higher in Canada than in the U.S. With regard to CT, the number of exams per 1,000 population in the U.S. was almost twice that in Canada. However, both the number of exams per scanner and the number of exams per FTE technologist were substantially higher in Canada than in the U.S. For both MRI and CT, the data indicate that even though the U.S. has more scanners per million population than Canada, the scanners were used more intensively in Canada. There is evidence of oversupply of some medical technology equipment in the U.S., including MRI and CT scanners.[4, 5] Note that MRI and CT scanners were in operation about the same number of hours in both Canada and the U.S.

The number of exams per 1,000 population and exams per scanner reported for England[6] in Table 7 is for the public sector only. According to data reported in the section on Sources and Methods of OECD Health Data 2007,[7] up to 24% of MRI scanners in England were in the private sector (estimate of 88 MRI scanners). Therefore, there is an under-estimation of exams per 1,000 population in England. For this reason, no direct comparison can be made for the number of exams per 1,000 population between Canada and England. However, number of exams per scanner is not likely to be under-estimated. Therefore, comparison can be made in the case of this indicator.

There were 12.4% more MRI exams per scanner in Canada than in England.[ii] Within the UK, a separate count of CT scanners for England was unavailable. Therefore, it was not possible to report CT exams per scanner for England.

A Belgian study8 reports average MRI and CT activity level per 1,000 population and per scanner for some selected countries or jurisdictions. It uses figures from the International Network of Agencies for Health Technology Assessment (INAHTA) survey. The figures are for 2004 and are used in the case of Belgium, Denmark, Spain and Sweden. However, it should be noted that most of the indicators for England, U.S. and Canada are for 2006-2007.

Belgium scored higher than Canada for number of MRI and CT exams per 1,000 population. Number of MRI and CT exams per 1,000 population was respectively 38.0% and 33.9% higher in Belgium than in Canada. Note that Belgium had 10% more MRI scanners per million population than Canada; it also had almost three times as many CT scanners per million population as Canada. Belgium also scored higher than Canada for number of MRI exams per scanner. However, this was not the case for number of CT exams per scanner. Using the highest estimates, Belgium performed about 30% more MRI exams per scanner than Canada, but Canada performed almost 50% more CT exams per scanner than Belgium.

i. A definition of exams is not provided in the U.S. report. However, further investigation suggests that an exam in the U.S. is defined as the number of scans relating to one body part.

ii. A definition of exams is not provided in the imaging and radio-diagnostics annual statistics for England. However, further investigation suggests that the data should be reported as one unit of activity for each time the scanner is operated.

On the other hand, Canada scored higher than Sweden in the utilization-based indicators, except for the number of MRI exams per 1,000 population, where Sweden performed 24.9% more.[iii] It is interesting to notice that even though Sweden had about 1.5 times as many CT scanners per million population as Canada, Canada still performed about 16% more CT exams per 1,000 population than Sweden. Finally, Canada scored higher than Denmark and Spain in both the number of MRI and CT exams per 1,000 population[iv] and the number of MRI and CT exams per scanner.

In spite of the fact that on average, Canada uses its MRI and CT scanners more intensively than the U.S. and some EU countries, in some jurisdictions, both average number of exams and average number of hours in operation seem to indicate an underutilization of MRI and CT scanners (see Figures 48 to 52 and Table 6). In an article entitled *Could MRI and CT Scanners be Operated More Intensively in Canada*,[9] it has been estimated that an additional 31% operating capacity may exist for MRI and 68% for CT without additional capital or infrastructure investments. These averages hide substantial provincial variations.

Many factors might explain the low number of exams performed per scanner in a given jurisdiction: insufficient operating funds, staffing unavailability, population density, geographic location, access, age of equipment, technical problems, etc.

iii. Sweden had almost twice as many MRI scanners per million population as Canada.

iv. Even though both Denmark and Spain scored higher than Canada in the number of MRI and CT scanners per million population.

R E F E R E N C E S

1. R. N. Rankin, “Magnetic Resonance Imaging in Canada: Dissemination and Funding,” *Canadian Association of Radiologists Journal* 50, 2 (April 1999): pp. 89–92.

2. Information Services for the Health Care and Scientific Markets *Benchmark Report MRI* (Des Plaines, Illinois: IMV Medical Information Division, Inc., 2006).

3. Information Services for the Health Care and Scientific Markets *Benchmark Report CT* (Des Plaines, Illinois: IMV Medical Information Division, Inc., 2006).

4. P. B. Ginsburg and J. M. Grossman, “When The Price Isn’t Right: How Inadvertent Payment Incentives Drive Medical Care,” *Health Affairs—Web Exclusive* (August 9, 2005): pp. 376–384.

5. C. L. Bryce and K. E. Cline, “The Supply and Use of Selected Medical Technologies,” *Health Affairs* 17, 1 (January/February 1998): pp. 213–24.

6. United Kingdom Department of Health, Hospital Activity Statistics—*Number of Imaging and Radiodiagnostics Examinations or Tests, NHS Organizations in England*, [online], published September 12, 2007, cited October 2, 2007, from <http://www.performance.doh.gov.uk/hospitalactivity/data_requests/download/imaging_and_radiodiagnostics/imag_07.xls>

7. Organisation for Economic Co-operation and Development, *OECD Health Data 2007* (CD-ROM) (July 2007 Edition).

8. P. Demaerel et al., *Magnetic Resonance Imaging. Health Technology Assessment (HTA)*. (Brussels: Belgian Health Care Knowledge Centre [KCE]; 2006). KCE reports 37C (D/2006/10.273/34).

9. R. Ariste and G. Fortin, “Could MRI and CT Scanners Be Operated More Intensively in Canada” *Healthcare Policy* 3, 1, August 2007.