

## The Private Cost of Public Queues for Medically Necessary Care, 2017

by Feixue Ren and Bacchus Barua

### SUMMARY

■ One measure of the privately borne cost of wait times is the value of time that is lost while waiting for treatment.

■ Valuing only hours lost during the average work week, the estimated cost of waiting for care in Canada for patients who were in the queue in 2016 was more than \$1.7 billion. This works out to an average of about \$1,759 for each of the estimated 973,505 Canadians waiting for treatment in 2016.

■ This is a conservative estimate that places no intrinsic value on the time individuals spend waiting in a reduced capacity outside of the work week. Valuing all hours of the week, in-

cluding evenings and weekends but excluding eight hours of sleep per night, would increase the estimated cost of waiting to \$5.2 billion, or about \$5,360 per person.

■ This estimate only counts costs that are borne by the individual waiting for treatment. The costs of care provided by family members (the time spent caring for the individual waiting for treatment) and their lost productivity due to difficulty or mental anguish are not valued in this estimate. Moreover, non-monetary medical costs, such as increased risk of mortality or adverse events that result directly from long delays for treatment, are not included in this estimate.

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## Introduction

In November 2016, the Fraser Institute released its 26th annual measurement of waiting times for medically necessary treatments in Canada (Barua and Ren, 2016a). The study reported that the national median waiting time from specialist appointment to treatment was 10.6 weeks in 2016, which is 0.8 weeks higher than in 2015.

However, the measurement of waiting times, or the examination of the absolute delay Canadians must endure in order to receive medically

necessary care, is only one way of looking at the burden of waiting for health care. We can also calculate the privately borne cost of waiting: the value of the time that is lost while waiting for treatment.<sup>1</sup>

## The privately borne cost of waiting for care

One way of estimating the privately borne cost of waiting for care in Canada was originally developed by Steven Globerman and Lorna Hoye (1990).<sup>2</sup> They calculated the cost of waiting by

**Table 1: Estimated Number of Procedures for which Patients are Waiting after Appointment with Specialist, by Specialty, 2016**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	5,778	4,788	544	540	2,409	2,494	239	1,342	—	—	18,135
Gynaecology	4,603	4,666	867	775	8,905	4,405	—	997	67	459	25,742
Ophthalmology	28,398	19,704	3,351	7,312	62,902	26,214	3,246	2,939	430	1,154	155,648
Otolaryngology	5,108	4,649	921	2,066	12,772	5,166	953	977	150	772	33,533
General Surgery	17,658	8,679	2,668	2,278	22,316	8,051	2,431	10,753	911	5,616	81,360
Neurosurgery	1,826	2,766	293	75	5,298	764	570	168	—	—	11,760
Orthopaedic Surgery	30,753	14,145	4,250	4,726	41,139	19,676	4,568	7,853	—	2,087	129,198
Cardiovascular Surgery	532	165	7	—	526	302	267	377	—	11	2,187
Urology	7,406	2,872	844	819	14,872	5,347	1,699	2,335	—	1,245	37,439
Internal Medicine	17,098	7,570	2,075	2,331	13,931	1,977	322	2,881	323	1,904	50,412
Radiation Oncology	150	27	2	5	402	229	—	20	4	12	850
Medical Oncology	255	319	—	—	404	152	—	34	3	19	1,186
Residual	78,995	56,851	12,533	17,084	151,155	57,309	13,082	24,430	1,311	13,307	426,055
<b>Total</b>	<b>198,558</b>	<b>127,200</b>	<b>28,354</b>	<b>38,012</b>	<b>337,030</b>	<b>132,084</b>	<b>27,377</b>	<b>55,106</b>	<b>3,198</b>	<b>26,586</b>	<b>973,505</b>
Proportion of Population	4.2%	3.0%	2.5%	2.9%	2.4%	1.6%	3.6%	5.8%	2.2%	5.0%	2.7%

Notes: a) Totals may not match sums of numbers for individual procedures due to rounding.

b) All data regarding oncology refer only to procedures done in hospitals. Most cancer patients are treated in cancer agencies. Therefore, the oncology data must be regarded as incomplete.

Source: Barua and Ren, 2016a.

estimating the amount of time that could not be used productively by a patient while waiting for treatment.

Globerman and Hoye's methodology is relatively straightforward. First, multiply the number of patients waiting for treatment by the wait times for those treatments in order to derive an estimate of the total number of weeks all patients will spend waiting for care. Then multiply this value by a measure of the proportion of time spent waiting for treatment that is rendered unproductive owing to the physical and emotional impact of an untreated medical condition. The monetary value of this lost productive time can then be projected.

In 2016, an estimated 973,505 Canadians were waiting for care after an appointment with a specialist (table 1). These Canadians were expected to wait, on average, for 10.6 weeks in order to receive medically necessary treatment. Of course, the wait times patients faced varied significantly across provinces and medical specialties (table 2). Multiplying the number of Canadians waiting in each of the 12 medical specialties in each of the 10 provinces by the weighted median wait time for that medical specialty in that province gives a rough estimate of the total amount of time that Canadians waited for treatment in 2016: about 13.8 million weeks. This estimate is higher than the 11.5 million weeks estimated for 2015 due to an increase in both wait times and the estimated number of Canadians waiting for care (Barua and Ren, 2016a; Barua and Ren, 2016b; Barua, 2015).

Globerman and Hoye's original estimate for the cost of waiting, which came from responses to a survey of physicians, used specialty-specific measures of the proportion of patients who were "experiencing significant difficulty in carrying on their work or daily duties as a result of

their medical conditions" (1990: 26). The proportions they estimated ranged from 14% of patients in gynaecology to 88% in cardiovascular surgery, and averaged 41% overall (Globerman with Hoye, 1990; Esmail, 2009a). The estimates of lost productivity measured by Globerman and Hoye cannot necessarily be applied today because of advances in medicine and the medical system's ability to deal with pain and discomfort with pharmaceuticals. These advances may allow many Canadians who are suffering significant difficulties to function at a higher level today than they would have in 1990, or even to maintain their normal activity levels. For this reason, our estimation of the cost of waiting in 2016 is based on more recent data from Statistics Canada's Canadian Community Health Survey [CCHS]. Specifically, the survey's Health Services Access Subsample [HSAS] provides estimates for the number of patients whose lives were affected by the wait for non-emergency surgery. Using data from the most recent HSAS, the authors estimate that 13.2% of people were adversely affected by their wait for non-emergency surgery in 2013 (Statistics Canada, 2014). This percentage is below even the lowest specialty-specific measure estimated by Globerman and Hoye (1990).<sup>3</sup>

An assumption that 13.2% of people waiting for treatment in 2016 experienced significant difficulties in their daily lives as a result of their untreated medical condition, and thus lost productivity while waiting for treatment, results in an estimate that roughly 1.8 million weeks were "lost" while patients waited for treatment. However, because this estimate is based on the assumption that all individuals face the same wait time for treatment in each specialty/province combination, it is mathematically equivalent to assuming that 13.2% of the productivity of all Canadians waiting for care was lost to a combination of mental anguish and the pain

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**Table 2: Median Patient Wait for Treatment after Appointment with Specialist, by Specialty, 2016 (in Weeks)**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	35.2	32.4	17.9	16.7	5.4	9.9	6.8	69.3	—	—	16.0
Gynaecology	11.7	10.2	6.2	6.3	7.7	8.8	—	10.5	4.0	6.4	8.7
Ophthalmology	21.3	17.8	9.4	30.0	19.4	10.6	19.9	8.5	11.8	8.7	16.5
Otolaryngology	19.6	17.5	8.8	23.2	12.3	7.3	15.0	13.7	17.8	16.0	12.6
General Surgery	7.3	7.2	4.6	4.0	4.1	5.6	13.5	25.0	12.6	14.0	6.4
Neurosurgery	12.4	25.1	9.3	3.1	12.8	18.0	29.1	7.0	—	0.0	14.4
Orthopaedic Surgery	39.3	21.9	17.4	20.1	17.7	17.2	30.2	49.3	—	28.8	22.5
Cardiovascular Surgery (Urgent)*	2.3	1.3	6.0	—	1.0	0.7	14.5	8.0	—	1.0	1.6
Cardiovascular Surgery (Elective)	7.3	2.5	—	—	3.2	7.8	29.0	12.0	—	6.5	5.9
Urology	7.4	5.2	3.9	5.9	3.9	8.7	12.3	9.4	—	6.4	5.4
Internal Medicine	13.1	10.6	7.2	7.0	5.2	3.7	4.9	11.6	7.7	9.4	7.9
Radiation Oncology	10.3	2.0	2.1	2.6	2.0	3.3	—	2.2	2.0	2.0	2.7
Medical Oncology	3.7	3.9	—	—	1.1	1.0	—	2.1	2.0	1.7	1.7
<b>Weighted Median</b>	<b>14.5</b>	<b>12.7</b>	<b>7.9</b>	<b>11.7</b>	<b>8.4</b>	<b>8.9</b>	<b>17.4</b>	<b>17.7</b>	<b>10.5</b>	<b>11.5</b>	<b>10.6</b>

Note: To calculate the total weeks of waiting for care, only Cardiovascular Surgery (Urgent) was used.

Source: Barua and Ren, 2016a.

**Table 3: Average of Average Hourly and Weekly Wages, by Province, January to December, 2016**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Nominal average hourly wage	\$25.3	\$29.6	\$26.8	\$23.5	\$26.2	\$24.2	\$21.9	\$22.8	\$21.1	\$24.3	\$25.7
Nominal average weekly wage	\$920.9	\$1,111.5	\$999.8	\$857.0	\$958.5	\$858.3	\$821.3	\$844.2	\$784.2	\$943.1	\$940.3

Notes: a) Wages reported are earned wages or salaries including tips, commissions, and bonuses before taxes and other deductions for all occupations, both sexes, ages 15 and over.

b) The nominal average hourly/weekly wage is an average of the hourly/weekly wage of January to December.

c) Previous reports used wage information from Statistics Canada's CANSIM table 282-0069, which has been discontinued and replaced by table 282-0151.

Source: Statistics Canada, 2017a; calculations by authors.

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**Table 4: Estimated Cost of Waiting for Medically Necessary Health Services from Specialist Appointment to Treatment, by Province and Specialty, 2016 (\$ thousands)**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	\$24,770	\$22,765	\$1,289	\$1,023	\$1,635	\$2,799	\$176	\$10,375	—	—	\$64,832
Gynaecology	\$6,571	\$6,957	\$709	\$554	\$8,663	\$4,380		\$1,167	—	\$367	\$29,396
Ophthalmology	\$73,578	\$51,520	\$4,179	\$24,848	\$154,388	\$31,363	\$6,989	\$2,769	\$524	\$1,254	\$351,411
Otolaryngology	\$12,182	\$11,914	\$1,076	\$5,434	\$19,906	\$4,303	\$1,549	\$1,494	\$277	—	\$59,669
General Surgery	\$15,754	\$9,188	\$1,606	\$1,025	\$11,443	\$5,110	\$3,554	\$29,961	—	\$9,771	\$88,599
Neruosurgery	\$2,753	\$10,172	\$362	\$26	\$8,567	\$1,559	\$1,801	\$132	—	—	\$25,371
Orthopaedic Surgery	\$147,048	\$45,466	\$9,751	\$10,760	\$92,372	\$38,411	\$14,942	\$43,204	—	\$7,500	\$409,455
Cardiovascular Surgery	\$148	\$31	\$5	—	\$67	\$25	\$420	\$336	—	\$1	\$1,033
Urology	\$6,647	\$2,196	\$433	\$550	\$7,317	\$5,296	\$2,269	\$2,439	—	\$999	\$28,147
Internal Medicine	\$27,226	\$11,770	\$1,969	\$1,845	\$9,202	\$833	\$173	\$3,735	\$260	\$2,223	\$59,233
Radiation Oncology	\$187	\$8	\$0	\$2	\$102	\$86	—	\$5	\$1	\$3	\$394
Medical Oncology	\$116	\$181	—	—	\$57	\$17	—	\$8	\$1	—	\$384
Residual*	\$139,635	\$106,109	\$13,096	\$22,569	\$161,351	\$57,919	\$24,651	\$48,266	\$1,431	\$19,014	\$594,040
<b>Total Cost</b>	<b>\$456,614</b>	<b>\$278,276</b>	<b>\$34,475</b>	<b>\$68,637</b>	<b>\$475,070</b>	<b>\$152,102</b>	<b>\$56,524</b>	<b>\$143,892</b>	<b>\$3,707</b>	<b>\$42,669</b>	<b>\$1,711,966</b>

\* The “residual” count is a count of the number of non-emergency procedures for which people are waiting in Canada that are not included in the Fraser Institute’s survey. The wait time used for calculating the residual cost is each province’s weighted median wait time for all specialties included in *Waiting Your Turn*.

Source: Table 1; Table 2; Statistics Canada, 2014; calculations by authors.

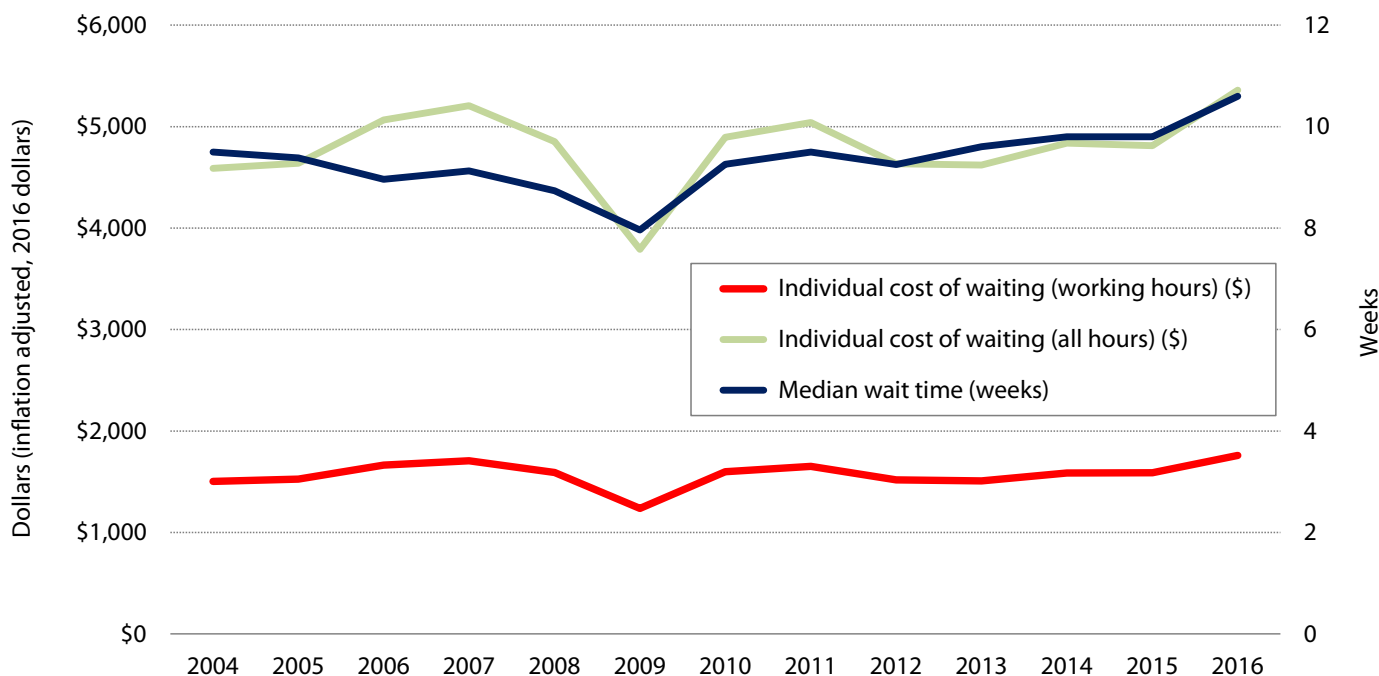
and suffering that can accompany any wait for treatment. Multiplying this lost time by an estimate of the average weekly wage of Canadians in 2016 (given in table 3), which provides an estimate for the value of the lost time to each individual,<sup>4</sup> gives an estimate of the cost of productive time that was lost while individuals waited for medically necessary treatments in 2016 (table 4).

The estimated cost of waiting for care in Canada for patients who were in the queue in 2016, according to calculations based on the methodology produced by Globerman and Hoyer (1990),

was more than \$1.7 billion—an average of about \$1,759 for each of the estimated 973,505 Canadians waiting for treatment in 2016. Alternately, that cost works out to roughly \$13,322 for each individual among the 13.2% of patients in the queue who were suffering considerable hardship while waiting for care.<sup>5</sup>

Of course, this number is a conservative estimate of the private cost of waiting for care in Canada. It assumes that only those hours during the average work week should be counted as lost. It places no intrinsic value on the time individuals spend waiting in a reduced capacity

**Figure 1: Calculated Cost of Waiting per Patient and Median Wait for Treatment after Consultation with Specialist, 2004–2016**



Sources: Statistics Canada, 2004-2014; Statistics Canada, 2017b; Esmail 2005-2014; Barua and Ren, 2016a and 2016b; calculation by authors.

outside of the working week. Valuing all hours of the week, including evenings and weekends but excluding eight hours of sleep per night, at the average hourly wage (given in table 3) would increase the estimated cost of waiting to \$5.2 billion or about \$5,360 per person.

This estimate only counts costs that are borne by the individual waiting for treatment. The costs of care provided by family members (in time spent caring for the individual waiting for treatment) and their lost productivity due to difficulty or mental anguish, are not valued in this estimate.<sup>6</sup> Non-monetary medical costs, such as increased risk of mortality or adverse events that result from long delays for treatment, are also not included in this estimate (Day, 2013). Moreover, we only estimate the

cost of the wait time from specialist to treatment, and do not include the cost of the 9.4 week wait time from referral by a general practitioner to seeing a specialist,<sup>7</sup> or other delays in the care pathway.

From a historical perspective, the estimated \$1,759 private cost of waiting for treatment per patient in 2016 is 17% higher than the \$1,504 (inflation adjusted, 2016 dollars) estimated for 2004 (see figure 1) and is 11% higher than the \$1,588 estimated for 2015. If hours outside of the work week are included, the estimated \$5,360 private cost of waiting per patient in 2016 is again 17% higher than the \$4,588 estimated for 2004 and 11% higher than the \$4,811 estimated for 2015.

## Update in methodology

Previous editions of this report (2005-2016) used a Statistics Canada finding that 11.0% of people were adversely affected by their wait for non-emergency surgery in 2005 (Statistics Canada, 2006). The authors of this year's report calculated a newer estimate of this figure (13.2%) based on raw data (weighted population estimates) contained in the 2014 Data Dictionary of the Canada Community Health Survey's (CCHS) Health Services Access Subsample (Statistics Canada, 2014).<sup>8</sup> The two estimates are, however, not directly comparable because the 11.0% used in the past reports was calculated using data that "do not reflect the waiting times of those still waiting at the time of the survey" (Statistics Canada, 2006). By including those still waiting at the time of the survey, the updated estimate for 2005 would be 14.4%. This suggests that previous reports may have underestimated the cost of waiting for treatment.

This year's report therefore also contains revised estimates of the cost of waiting since 2004 based on updated estimates of the percent of patients whose life are affected by the wait for non-emergency surgery calculated using data from successive iterations of the Canada Community Health Survey's [CCHS] Health Services Access Subsample Data Dictionaries<sup>9</sup> (2003 to 2013).

## Conclusion

The rationing of health care in Canada through queues for medically necessary health services imposes direct costs on those waiting for care. The ability of individuals who are waiting to enjoy leisure time and earn an income to support their families is diminished by physical and psychological pain and suffering. In addition, friends and family may be asked to help those

waiting for treatment, or may suffer similar reductions in their productive lives because of their own psychological pain.

In 2016, the estimated 973,505 Canadians who were waiting for treatment endured an estimated private cost of almost \$1.7 billion, and possibly substantially more, in lost productivity and leisure time.

## Notes

<sup>1</sup> The calculation here measures only the cost of the wait time from specialist to treatment, and does not include the cost of the 9.4 week wait time from referral by a general practitioner to seeing a specialist, or other delays in the care pathway. Thus, this estimate of the privately borne cost of waiting is an underestimate of the true privately borne cost of waiting.

<sup>2</sup> Globerman and Hoye employed this methodology in 1990 to develop an estimate of the cost of waiting for medically necessary treatment in the first measurement of waiting times in Canada published by the Fraser Institute. Follow-up examinations of the privately borne cost of queuing since 2004 published by the Fraser Institute also employ this methodology.

<sup>3</sup> Statistics Canada's findings are based on the percentage of survey respondents who reported that "waiting for non-emergency surgery affected their life." Globerman and Hoye's estimate measures the number of patients who "experienced significant difficulty carrying on their work or daily duties as a result of their medical conditions." Notably, in 2013, 11% of those who reported being affected by their wait reported a loss of income, while 21% experienced loss of work. At the same time, 45% experienced worry, anxiety, and stress, 54% experienced pain, and 42% experienced problems with activities of daily living (Statistics Canada, 2014; calculations by authors). The methodology employed here for the estimate of the private cost of waiting attempts to measure much more than just lost work or lost income. Rather, it estimates lost productivity in total, including lost on-the-job productivity, lost enjoyment of life, inability to play sports, etc. In other words, the private cost of waiting for care estimated here values the amount of time Canadi-

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ans spend waiting for care during which these individuals are unable to participate fully in their lives.

<sup>4</sup> Though extending this value of time to all individuals may seem questionable (given that some children and retired seniors will be included in the number of patients in the queue), one need only understand that the lost leisure or ability to concentrate that these individuals endure must have some value. Since seniors are enjoying increasing opportunities to engage in part-time employment, their labour/leisure trade off will be such that the last unit of leisure a senior citizen enjoys is equal in value to the last unit of work he or she undertakes. Seniors who choose not to work are clearly placing a higher value on their leisure time than the labour market will offer for their labour. For children, the value of their leisure (which can potentially be viewed as time for personal growth) or productivity at school (which can be viewed as an investment for the future) is assumed to be, for simplicity, not significantly different from that of a working adult. Furthermore, as there are likely to be few children waiting for treatment, any variation from the value of time for adults is not likely to have a marked effect on the average calculation.

<sup>5</sup> Globerman and Hoyer estimated the cost of queuing for medically necessary care to be about \$2,900 per patient in 1989. In 2016 dollars, this works out to approximately \$4,978.

<sup>6</sup> In 2013, 13% of individuals whose lives were affected by the wait times for treatment reported an increased dependence on family or friends based on the *CCHS 2013 Subsample Data Dictionary* (Statistics Canada, 2014; calculations by authors).

<sup>7</sup> In 2013, approximately 19.4% of individuals who visited a specialist indicated that waiting for the visit affected their life (Statistics Canada, 2014; calculations by authors).

<sup>8</sup> The authors estimated the rate using (population weighted) responses to WTM\_28 in the *CCHS 2013 Subsample Data Dictionary* (Statistics Canada, 2014). Due to the changes made by CCHS over time, the variable name may vary depending on the edition; however, the concept has stayed the same.

<sup>9</sup> The subsample (which includes estimates for all 10 provinces) on access to health care services (ACC) and waiting

times (WTM) has been conducted within the CCHS every odd year from 2001 to 2013. For even years, the authors calculated an average based on the preceding and following year. For example, in 2012, the authors took an average of the rate in 2011 (14.8%) and 2013 (13.2%) to get the 14.0%. In 2015, the HSAS subsample was discontinued. The authors therefore use the 13.2% from the 2013 edition for all subsequent calculations.

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ISSN 2291-8620

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## Acknowledgments

This study is primarily based on Nadeem Esmail's 2014 study of the same name. Any remaining errors or oversights are the sole responsibility of the authors.

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