

by Bacchus Barua and David Jacques

## The Private Cost of Public Queues for Medically Necessary Care, 2019

### 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 2018 was about \$2.1 billion. This works out to an average of about \$1,924 for each of the estimated 1,082,541 Canadians waiting for treatment in 2018.

■ 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 \$6.3 billion, or about \$5,860 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.

## Introduction

In December 2018, the Fraser Institute released its 28th annual measurement of waiting times for medically necessary treatments in Canada (Barua and Jacques, 2018). The study reported that the national median waiting time from specialist appointment to treatment was 11.0 weeks in 2018, which is 0.1 weeks higher than in 2017.

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, 2018**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	3,767	3,016	349	139	5,138	3,283	938	1,875	—	—	18,505
Gynaecology	3,546	4,890	1,046	996	11,031	4,735	1,211	1,003	451	2,411	31,319
Ophthalmology	34,920	21,541	3,791	11,018	56,019	27,564	2,855	6,674	1,342	1,805	167,531
Otolaryngology	3,763	5,148	1,969	1,464	10,304	4,551	751	684	—	596	29,231
General Surgery	20,049	13,444	2,510	5,775	26,668	10,938	886	9,938	239	3,208	93,655
Neurosurgery	1,728	2,009	395	—	4,397	2,766	—	210	—	—	11,506
Orthopaedic Surgery	32,605	19,851	5,679	9,789	42,080	19,093	6,451	7,741	—	1,919	145,206
Cardiovascular Surgery	664	212	7	—	280	123	38	—	—	24	1,348
Urology	7,663	8,103	298	818	14,514	5,745	1,482	2,522	—	—	41,145
Internal Medicine	14,717	10,860	1,915	7,193	17,915	2,429	702	2,453	3	1,499	59,687
Radiation Oncology	86	41	4	1	406	166	—	22	—	—	727
Medical Oncology	223	187	—	—	950	318	—	89	3	—	1,770
Residual	82,224	69,326	14,724	30,750	165,140	63,514	13,021	25,840	2,488	13,885	480,912
<b>Total</b>	<b>205,955</b>	<b>158,630</b>	<b>32,689</b>	<b>67,943</b>	<b>354,843</b>	<b>145,224</b>	<b>28,336</b>	<b>59,051</b>	<b>4,524</b>	<b>25,347</b>	<b>1,082,541</b>
Proportion of Population	4.3%	3.7%	2.8%	5.1%	2.5%	1.7%	3.7%	6.2%	3.0%	4.8%	2.9%

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 Jacques, 2018.

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 2018, an estimated 1,082,541 Canadians were waiting for care after an appointment with a specialist (table 1). These Canadians were expected to wait, on average, for 11.0 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<sup>3</sup> of the total amount of time that Canadians waited for treatment in 2018: about 16 million weeks. This estimate is higher than the 15 million weeks estimated for 2017 due to an increase in both wait times and the estimated number of Canadians waiting for care (Barua and Jacques, 2018; Barua and Hasan, 2018).

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 2018 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, Ren and Barua (2017) estimated 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>4</sup>

An assumption that 13.2% of people waiting for treatment in 2018 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 2.1 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

**Table 2: Median Patient Wait for Treatment after Appointment with Specialist, by Specialty, 2018 (in Weeks)**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	23.6	19.3	26.7	10.5	11.1	13.3	27.2	69.0	—	—	16.6
Gynaecology	9.4	10.4	8.6	7.6	9.4	9.6	14.1	11.0	24.5	19.3	10.1
Ophthalmology	23.6	18.9	12.3	35.8	16.9	10.8	17.2	17.8	41.2	11.6	17.0
Otolaryngology	15.0	20.4	15.8	17.7	9.7	6.3	11.6	9.8	—	10.6	10.9
General Surgery	7.6	8.8	4.1	9.4	4.5	7.1	5.5	18.2	3.2	7.4	6.7
Neurosurgery	11.9	20.9	11.6	—	11.1	13.9	—	8.0	—	—	12.8
Orthopaedic Surgery	42.2	29.3	24.3	42.2	17.7	15.8	38.7	41.7	—	23.5	24.4
Cardiovascular Surgery (Urgent)*	2.8	3.0	0.4	—	0.5	0.3	1.0	—	—	1.9	1.0
Cardiovascular Surgery (Elective)	4.9	18.7	4.0	—	4.8	4.5	20.0	—	—	11.4	5.9
Urology	7.1	13.0	1.5	6.0	3.7	9.0	10.5	9.4	—	—	5.8
Internal Medicine	10.7	11.7	6.8	19.6	6.8	4.5	9.7	8.7	2.0	7.7	8.9
Radiation Oncology	6.4	3.0	2.2	1.0	2.0	2.5	—	2.7	—	—	2.4
Medical Oncology	3.0	3.3	—	—	1.7	2.1	—	5.0	2.0	—	2.1
Weighted Median	14.1	14.9	9.2	19.7	8.3	9.1	16.6	17.5	16.0	10.8	11.0

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

Source: Barua and Jacques, 2018.

**Table 3: Average of Average Hourly and Weekly Wages, by Province, January to December, 2018**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Nominal average hourly wage (\$)	26.78	30.76	27.46	24.45	27.36	25.42	22.90	23.60	22.29	25.57	26.92
Nominal average weekly wage (\$)	974.82	1,158.16	1,021.73	889.89	1,001.69	903.15	863.39	875.72	831.13	983.62	984.08

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 14-10-0306-01 (formerly CANSIM 282-0151).

Source: Statistics Canada, 2019a; calculations by authors.

**Table 4: Estimated Cost of Waiting for Medically Necessary Health Services from Specialist Appointment to Treatment, by Province and Specialty, 2018 (\$ thousands)**

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	CAN
Plastic Surgery	11,426	8,910	1,255	171	7,538	5,202	2,913	14,972	—	—	52,387
Gynaecology	4,285	7,760	1,214	892	13,702	5,420	1,949	1,274	1,213	6,057	43,766
Ophthalmology	106,094	62,365	6,270	46,405	125,243	35,506	5,615	13,737	6,071	2,724	410,029
Otolaryngology	7,264	16,043	4,196	3,052	13,260	3,423	993	779	—	819	49,829
General Surgery	19,585	18,138	1,383	6,377	15,970	9,269	557	20,947	85	3,067	95,379
Neurosurgery	2,658	6,417	620	—	6,436	4,593	—	195	—	—	20,919
Orthopaedic Surgery	177,048	88,938	18,616	48,543	98,284	35,902	28,495	37,296	—	5,863	538,985
Cardiovascular Surgery	236	96	0	—	19	4	4	—	—	6	365
Urology	7,018	16,147	60	572	7,033	6,137	1,775	2,743	—	—	41,485
Internal Medicine	20,364	19,507	1,761	16,543	16,071	1,301	773	2,482	1	1,498	80,301
Radiation Oncology	71	19	1	0	107	50	—	7	—	—	256
Medical Oncology	85	93	—	—	218	80	—	52	1	—	530
Residual (using est. median data)*	149,487	158,142	18,186	71,237	181,511	68,740	24,674	52,376	4,365	19,492	748,208
<b>Total Cost</b>	<b>505,622</b>	<b>402,576</b>	<b>53,563</b>	<b>193,792</b>	<b>485,391</b>	<b>175,628</b>	<b>67,748</b>	<b>146,857</b>	<b>11,735</b>	<b>39,526</b>	<b>2,082,438</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*.

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

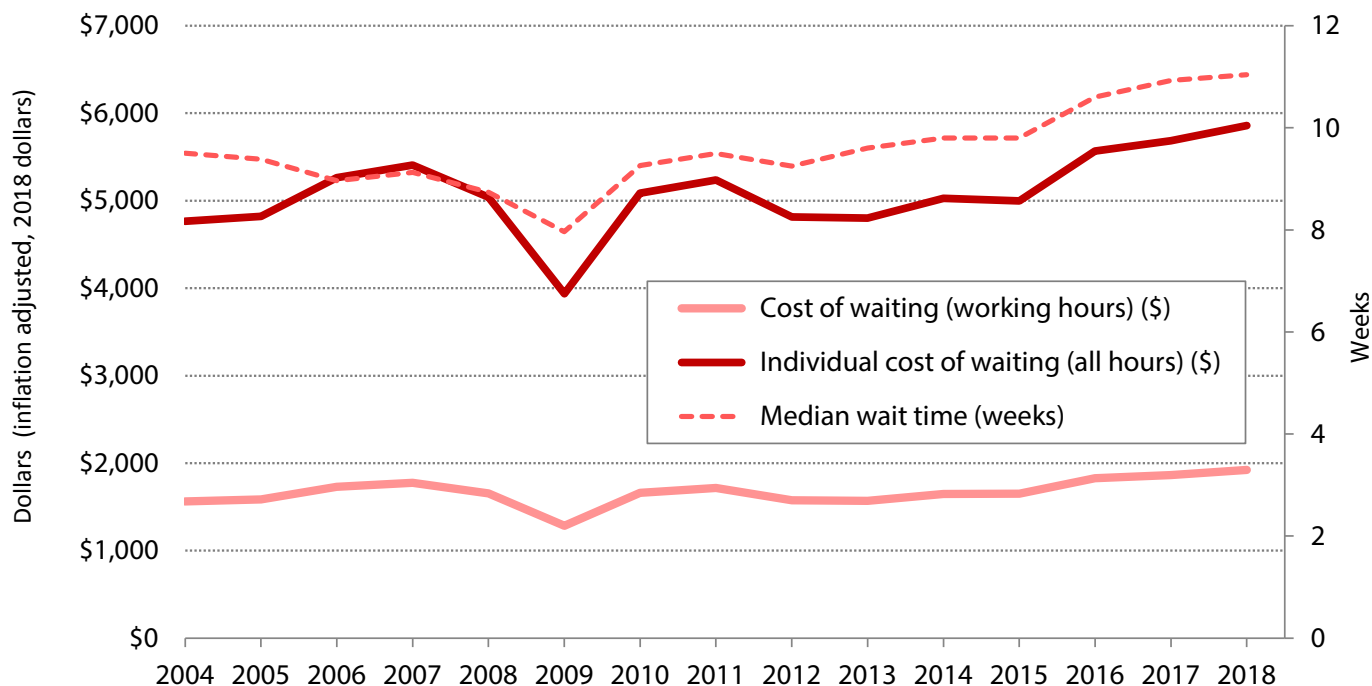
and suffering that can accompany any wait for treatment. Multiplying this lost time by an estimate of the average weekly wage of Canadians in 2018 (given in table 3), which provides an estimate for the value of the lost time to each individual,<sup>5</sup> gives an estimate of the cost of productive time that was lost while individuals waited for medically necessary treatments in 2018 (table 4).

The estimated cost of waiting for care in Canada for patients who were in the queue in 2018, according to calculations based on the methodology produced by Globerman and Hoyer (1990),

was almost \$2.1 billion—an average of about \$1,924 for each of the estimated 1,082,541 Canadians waiting for treatment in 2018. Alternately, that cost works out to roughly \$14,573 for each individual among the 13.2% of patients in the queue who were suffering considerable hardship while waiting for care.<sup>6</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

**Figure 1: Calculated Cost of Waiting per Patient and Median Wait for Treatment after Consultation with Specialist, 2004–2018**



Sources: Barua and Jacques, 2018; Barua and Hasan, 2018; Esmail 2005–2014; Statistics Canada, 2019a, 2019b; calculations by authors.

a reduced capacity 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 \$6.3 billion or about \$5,860 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>7</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 8.7 week wait time from referral by a general practitioner to seeing a specialist,<sup>8</sup> or other delays in the care pathway.

From a historical perspective, the estimated \$1,924 private cost of waiting for treatment per patient in 2018 is 23% higher than the \$1,562 (inflation adjusted, 2018 dollars) estimated for 2004 (see figure 1) and is 3% higher than the \$1,864 estimated for 2017. If hours outside of the work week are included, the estimated \$5,860 private cost of waiting per patient in 2018 is 23% higher than the \$4,767 estimated for 2004 and 3% higher than the \$5,687 estimated for 2017.

## Update in methodology

Editions of this report from 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). Ren and Barua (2017) 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>9</sup> This year's report also uses this more recent estimate. 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>10</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 2018, the estimated 1,082,541 Canadians who were waiting for treatment endured an estimated private cost of almost \$2.1 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 8.7 week wait time from referral by a general practitioner to seeing a specialist (Barua and Jacques, 2018), 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> This estimate includes the number of non-emergency procedures for which people are waiting that were not included in the survey, reported as the “residual” number of procedures for which people are waiting. For the purposes of calculation, it is assumed that the wait time for these procedures is the same as the weighted median for the 12 specialties in the province in question. For further details on how this number is calculated, see Barua and Jacques, 2018.

<sup>4</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 Ren and Barua, 2017). 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 Canadians spend waiting for care during which these individuals are unable to participate fully in their lives.

<sup>5</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>6</sup> Globerman and Hoye estimated the cost of queuing for medically necessary care to be about \$2,900 per patient in 1989. In 2018 dollars, this works out to approximately \$5,172.

<sup>7</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 Ren and Barua, 2017).

<sup>8</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 Ren and Barua, 2017).

<sup>9</sup> Ren and Barua (2017) 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>10</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, Ren and Barua (2017) calculated an average based on the preceding and following year. For example, in 2012, they 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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As the researchers have worked independently, the views and conclusions expressed in this paper do not necessarily reflect those of the Board of Directors of the Fraser Institute, the staff, or supporters.



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