

Hospital Associated Cost of Endometriosis in Canada: A Population-Based Study

Innie Chen MD, MPH, FRCSC , Kednapa Thavorn PhD ,
Paul J. Yong MD, PhD ,
Abdul Jamil Choudhry MBBS, MSc, FCPSP ,
Catherine Allaire MDCM, FRCSC

PII: S1553-4650(19)31182-3
DOI: <https://doi.org/10.1016/j.jmig.2019.09.771>
Reference: JMIG 3952

To appear in: *The Journal of Minimally Invasive Gynecology*

Received date: 10 June 2019
Revised date: 17 August 2019
Accepted date: 6 September 2019

Please cite this article as: Innie Chen MD, MPH, FRCSC , Kednapa Thavorn PhD , Paul J. Yong MD, PhD , Abdul Jamil Choudhry MBBS, MSc, FCPSP , Catherine Allaire MDCM, FRCSC , Hospital Associated Cost of Endometriosis in Canada: A Population-Based Study, *The Journal of Minimally Invasive Gynecology* (2019), doi: <https://doi.org/10.1016/j.jmig.2019.09.771>



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Original Article

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Authors:

Innie Chen MD, MPH, FRCSC^{1,2,3}

Kednapa Thavorn PhD^{2,3,4}

Paul J. Yong MD, PhD⁵

Abdul Jamil Choudhry MBBS, MSc, FCPSP²

Catherine Allaire MDCM, FRCSC⁵

Institutes:

¹Department of Obstetrics and Gynecology, University of Ottawa, ON

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²Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, ON

³Faculty of Medicine, University of Ottawa, Ottawa, ON

⁴Institute for Clinical and Evaluative Sciences (ICES uOttawa), Ottawa, ON

⁵Department of Obstetrics and Gynaecology, University of British Columbia, Vancouver, BC

Corresponding author:

Innie Chen, MD, MPH

1967 Riverside Drive. Rm 7236-3

Ottawa, ON, K1H 7W9

613-738-8400 ext 81740

ichen@toh.on.ca

Disclosure statement: The authors declare that they have no conflicts of interest.

Precis

In this Canadian population-based descriptive study, endometriosis associated hospital cost was found to be C\$30 million (U\$ 29.56 million) per year, and uterine endometriosis (including adenomyosis), hysterectomy, and older age were found to have higher average cost per case.

Abstract

Study Objective: To describe the hospital associated cost of endometriosis in Canada for April 2008 to March 2013.

Design: Population-based descriptive study

Setting: Canada, with the exception of the province of Quebec.

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Patients: All women aged 15-59 years discharged with endometriosis between April 2008 and March 2013.

Interventions: None

Measurements and Main Results: Over five years, 47,021 women were admitted for endometriosis with a total hospital cost of C\$152.21 million (U\$ 147.79 million) and cost of C\$3,237 (U\$ 3,143) per case. Uterine endometriosis accounted for 28.29% of cases; ovarian endometriosis, 27.44%; and other endometriosis 44.27%. Uterine endometriosis costed most at C\$4,137 (U\$ 4,017) per case, followed by ovarian endometriosis (C\$3,506; U\$ 3,404), and other endometriosis (C\$2,495; U\$ 2,422). Highest number of cases were in age groups 35-39 years (20.77%) and 40-44 years (20.44%). Hysterectomy accounted for 29.57% of surgical procedures. Encounters with hysterectomy were the most costly at C\$5,062 (U\$ 4,915) per

case, followed by the ones with other surgical procedures at C\$2,477 (U\$ 2,405) per case, and admissions with no surgical procedure at C\$2,164 (U\$ 2,101) per case.

Conclusion: The hospital cost associated with endometriosis was approximately C\$ 30 million (U\$ 29.56 million) per year, whereas uterine endometriosis, hysterectomy and older age were found to have higher average cost per case. Though this study focuses specifically on hospital admission and does not account for outpatient costs or indirect costs, this study nonetheless highlights the economic burden of this debilitating disease on Canadian society during the study period.

Key words: Endometriosis; Cost; Canada; Hospital admission; Hysterectomy

INTRODUCTION

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Endometriosis is a common and debilitating disease that is estimated to affect 10-15% of women of reproductive age. It is characterized by the presence of endometrial glands and stroma outside of the uterine cavity, and it is associated with severe cyclical and chronic pelvic pain, infertility, poor pregnancy outcomes, and even stillbirth^{1,2}.

Due to the high prevalence of endometriosis and the adverse effects on function and quality of life, the economic and social burden of disease on individuals, healthcare systems, and societies is thought to be substantial.

Several studies in the scientific literature have attempted to quantify the cost of endometriosis to the healthcare system (Table 1). These studies have generally classified healthcare cost into direct and indirect costs. Direct costs typically include inpatient, outpatient, surgery costs, drugs cost, medical services costs, and other health care service costs; while, indirect costs may include loss of productivity, absenteeism, short and long term disability, loss of leisure time, and adverse effects on quality of life³. Estimates of economic disease burden in Europe have

ranged from €3,114 (US\$4,324) to €9,872 (US\$13,113) per patient per year, while presenting a mix of direct and indirect costs⁴⁻⁷. Estimates for healthcare costs in the US have generally reported much higher figures ranging from US\$ 8,417 to US\$ 18,881 per patient per year or US\$5,400 to US\$12,644 per patient charge of hospital stay⁸⁻¹¹. However, such figures are difficult to extrapolate to the Canadian setting due to highly variable estimates and inherent differences in healthcare systems between countries.

In our search of the literature, we identified only one study conducted in the Canadian healthcare setting. This study included a convenience sample of 27 participants treated at two gynaecologic clinics in Alberta and Quebec. Information on medical and alternative treatments, work absenteeism, quality of life, and caregiver time were aggregated, and the societal cost of endometriosis in Canada was estimated to be C\$ 5200 (US\$5,257) per year, or a total of C\$1.8 billion (US\$1.82 billion) annual cost¹². While this study provides a much-needed Canadian estimate of the burden of endometriosis, the methodology presented is based on a small convenience sample of women and subjective reporting.

In most studies in the literature, surgery-associated hospital costs constitutes the major portion of healthcare costs for endometriosis patients⁹⁻¹¹, and a study on hospital-associated cost has potential to shed light on overall estimates of healthcare costs. Such information regarding estimates of costs to the healthcare system can be used to inform health administrators and policy makers to enable appropriate resource allocation for this condition. The Canadian Institute for Health Information is a national data repository which collects information about all patients requiring hospital care in Canada, except Quebec. Our objective was to describe the hospital-associated cost of associated with endometriosis in Canada using a comprehensive national dataset for April 2008 to March 2013.

METHODS

Design

A population-based descriptive study was conducted for women discharged after admission for endometriosis from April 1, 2008 to March 31, 2013.

Data Source and structure

The Canadian Institute for Health Information (CIHI) maintains many databases to calculate a large number of clinical, financial, and other indicators across health systems. The Discharge Abstract Database (DAD) was used for this study, as it collects demographic, clinical and administrative information on hospital inpatient discharges and day surgery intervention. Data is submitted directly from all acute care facilities or their respective health/regional authorities or ministries/departments of health in all provinces and territories, with the exception of Quebec.¹³

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For diagnosis coding, CIHI-DAD uses International Classification of Diseases and Related Health Problems - Tenth Revision, Canada (ICD-10-CA). For coding of interventions, the Canadian Classification of Health Interventions (CCI) is used.

In CIHI-DAD, each case is assigned an MCC and Case Mix Groups (CMG) based on nature of activity and amount of resources required to provide services within hospital. Patient cost is estimated based on their Major clinical category (MCC) and Case Mix Groups (CMG), Resource Intensity Weight (RIW) and Cost per Weighted Case (CPWC). RIW measures the intensity of resource use associated with different diagnostic, surgical procedure and demographic characteristics of an individual. While RIW represents the relative resources used by a patient within a CMG, CPWC at the jurisdictional level includes direct hospital costs that can be attributed to patients, such as e.g. nursing inpatient services, and diagnostic imaging. Capital costs and physician services during the hospital stay are not included. CPWC provides a

measure of the cost to provide care to a standard hospital patient; this measure varies across jurisdictions. The total hospital cost is calculated represents the average cost of one patient receiving services in a hospital within that specific jurisdiction. The estimated average cost for services provided to a typical hospital inpatient is the weighted average generated by multiplying the CPWC for the selected each jurisdiction with by the average RIW of all typical cases within a specific CMG and age group ¹⁴.

Data extraction and analysis

After approval by our institutional ethics board, data was requested and procured from CIHI. Study subjects included all women 15-59 years of age discharged between April 1, 2008 and March 31, 2013 and who had an inpatient admission or surgery for endometriosis. There were no exclusions. MRDx codes included endometrioses of uterus (N800), ovary (N801), fallopian tube (N802), pelvic peritoneum (N803), rectovaginal septum/vagina (N804), intestine (N805), cutaneous scar (N806), others (N808), and unspecified (N809). For all selected study subjects, data was extracted for inpatient status, facility province, year of discharge, CMG, MCC, MRDx, CCI principal intervention, age group, RIW, and average CPWC. For this study, endometriosis was classified as endometriosis of the uterus (including uterine adenomyosis), endometriosis of the ovaries, and other endometriosis (all other sub-classifications of endometriosis). Interventions were classified as hysterectomy, other surgical procedures, and admissions with no surgical procedure. Descriptive analyses used absolute frequency, relative frequencies, and means to describe age, diagnosis, and CPCW, and total hospital cost. All costs in the study are presented in Canadian dollars (C\$) with United States dollars (US\$) equivalent, for ease of comprehension of international readers. Bank of Canada annual exchange rate were used for conversion of Euros and Canadian dollars to US dollars. Currency data from this study was converted as C\$ 1 = US\$ 0.971, based on exchange rate of 2010 i.e. the mid study year. For all

other conversions of Canadian dollars or Euros into US dollars from published data annual exchange rates for the year of publication were used¹⁵.

RESULTS

Over a period of five years, a total of 47,021 women had a hospital encounter (admission or day surgery) for endometriosis, resulting in a total hospital cost of C\$ 152.21 million (U\$ 147.79 million) over the study period, or C\$ 30.44 million (U\$ 29.56 million) per year, with an average cost of C\$ 3,237 (U\$ 3,143) per case. Uterine endometriosis accounted for 28.29% of hospital admissions; ovarian endometriosis, 27.44%; while, other endometriosis accounted for 44.27% of admissions. Uterine endometriosis was the most costly disease category at C\$ 4,137 (U\$ 4,017) per case, followed by ovarian endometriosis (C\$ 3,506; U\$ 3,404), and other endometriosis (C\$ 2,495; U\$ 2,422). The highest number of cases were in age groups 35-39 years (20.77%) and 40-44 years (20.44%). (Table 2)

Regarding the types of surgical procedures performed during these encounters, hysterectomy accounted for 29.57% of surgical procedures, while 69.08% were other surgical procedures, and 1.35% hospital admissions did not include a surgical procedure. In terms of the total cost of these encounters, admissions with other surgical procedures represented 52.86% of the total hospital-associated costs of -associated endometriosis. Admissions with hysterectomy represented 46.24% of the total hospital cost, and admissions with no surgical procedure accounted for 0.90% of the total hospital cost. Regarding the average cost per encounter based on procedures, encounters with hysterectomy were most costly at C\$ 5,062 (U\$ 4,915) per case followed by the ones with other surgical procedures at C\$ 2,477 (U\$ 2,405) per case and no surgical procedure at C\$ 2,164 (U\$ 2,101) per case. (Table 3)

When stratified by uterine endometriosis, ovarian endometriosis, or other endometriosis, the cost of encounters with hysterectomy or no surgical procedure was very similar across the disease categories. However, encounters for other surgical procedures were on average more costly for ovarian endometriosis (C\$ 3,224; U\$ 3,130), compared with uterine endometriosis (C\$ 2,356; U\$ 2,288) and other endometriosis (C\$ 2,048; U\$ 1,988). (Table 4) Distribution of disease type varied with the age of patients, where diagnoses of other endometriosis peaked at a younger age, followed by ovarian endometriosis, and uterine endometriosis. (Figure 1)

DISCUSSION

This study found that between the April 2008 and March 2013, hospital admission associated with endometriosis costs the Canadian national and provincial governments over C\$ 30 million (U\$ 29.13 million) per year.

In Canada, the total hospitalization cost of acute inpatient care (excluding physician fee) was C\$ 24.4 billion (U\$ 23.7 billion) in year 2012-13¹⁶. Compared with the cost of more frequently studied diseases, which tend to affect both men and women later in life than gynecologic diseases – such as, acute myocardial infarction (C\$ 510.8 million, U\$ 479.2 million), cerebrovascular disease (C\$ 509.4 million, U\$ 477.9 million), and diabetes mellitus (C\$ 283.9 million, U\$ 266.3 million)¹⁷ – the hospital associated cost of endometriosis is much lower. However, women with endometriosis are generally young and otherwise healthy, and women in this demographic tend not to require hospital admission for chronic disease.

As more than 98% of patients admitted to the hospital underwent a surgical procedure, the admissions are restricted to individuals requiring a surgical procedure which suggests that patients that can be managed conservatively are treated on outpatient-basis, thus avoiding unnecessary hospital use. However, as endometriosis is a lifelong condition and most women

with endometriosis are managed conservatively, our figures do not account for emergency visits without admission or the large number of women managed outside of the hospital setting ¹⁸, nor indirect costs.

Gao et al published a review of studies, published from 1990 to 2003, which covered cost of endometriosis, many a times in a mix of other conditions like chronic pelvic pain, general gynecological conditions or surgeries¹¹. Literature review in our paper also provides an update of studies describing cost of endometriosis (Table 1).

It is difficult to directly compare our figures with the only other published Canadian study by Levy et al., since our study describes only the cost borne by the public for associated with hospital admissions, while Levy et al. described both direct (surgical and diagnostic procedures, health care provider visits, prescription medications and emergency hospitalization) and indirect (lost productivity and lost leisure time) costs per patient, with indirect costs representing the major component at C\$ 4,043 (US\$ 4,088) per patient¹². Further, as most women with endometriosis are treated with first-line medical therapy before contemplating surgery, it is likely that both studies are underestimates to the true cost to society, though similar studies in chronic pelvic pain populations may serve as a reference point for comparison ¹⁹.

The reported US figures for the cost of endometriosis to the healthcare system comprise of highly variable estimates. In one study, patients with endometriosis were estimated to cost the healthcare system US\$ 13,199 in the first year post diagnosis, compared with US\$ 3,747 for non-endometriosis controls ⁹. In a separate study, the average cost for endometriosis related abdominal hysterectomy was estimated to be US\$ 11,397, while the cost for therapeutic laparoscopy was US\$ 6,856 ⁸. Another study estimated endometriosis-related treatment cost among a surgery cohort to be US\$ 8,417, compared with US\$ 275 among non-surgery controls for the one year period following the diagnosis of endometriosis. For the surgery cohort, most of the

cost (68.8%) was related to inpatient admission, and the bulk of the remainder (20.7%) for pharmacy claims ¹⁰. In previous US publication based on national clinical database analyses, the average hospital charge per hospital stay ranged from U\$ 16,576 (1993) to U\$ 18,939 (2002) ¹¹.

Outside of North America, a number of studies from European countries, with primarily publically-funded health systems, generally report lower ranges of hospital costs associated with the treatment of endometriosis. A Belgian study reported the annual cost per patient to be €9,872 (U\$ 13,113) at a tertiary care hospital, which included direct healthcare costs of €2,238 (U\$2,973) and indirect costs from loss of productivity of €7,434 (U\$ 9,875) ⁴. Another multicenter study in ten European countries demonstrated an average annual total costs of €9,579 (U\$ 12,314) with direct health care costs of €3,113 (U\$ 3,999). In this study, as in the Belgian study, the costs of loss of productivity were again double that of the health care costs ⁵.

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An Austrian study calculated an average annual cost for one case of endometriosis to be €7,712 (U\$ 10,244), with €5,606 (U\$ 7,447) as direct cost and €2,106 (U\$ 2,798) as indirect cost ⁶.

Some studies on a variety of health conditions also provided some cost information pertaining to endometriosis. In one such Finnish study on women with hysterectomy for non-cancerous conditions, the total hospital cost for the period of 3 months prior to 6 months following hysterectomy was estimated to be €3,114 (U\$ 4,324) based on their sample of 20 endometriosis patients ⁷.

Despite the variation in study design and the elements of cost being measured, the overall picture appears to suggest that the US estimates for the cost of endometriosis care are generally higher than those of Canada or Europe. Since our study only focused on hospital-associated costs, it may seem more appropriate to compare our studies with US figures rather than European estimates. However, even such comparisons are not straightforward. As an example, the cost estimates in our study only included hospital admission costs, while US

studies - despite highlighting that hospital admission forms the major portion of the total cost - also included non-hospital-admission cost. Further, our study provides the average costs for a single admission, and mostly for surgical procedures, while most US and European studies provided annual cumulative costs per patient. An additional layer of complexity is the variation in structure in the healthcare system for each country. In the US, medical care system is predominantly led by private medical insurance companies, while in Canada, hospital care is primarily provided by public funds through a network of government-owned facilities, which is similar to healthcare systems in most of European healthcare systems²⁰. Even though direct comparison between estimates may not be possible, all reports support the notion of endometriosis being a burden to individuals, healthcare systems, and society.

In our study, we found that increased age was associated with higher per-patient costs of care.

While increasing costs with age may be associated increasing age-related comorbidities²¹, it is also likely that the increasing cost with age may be related to higher frequency of hysterectomies in women who have completed childbearing.

Though cost of admissions involving hysterectomy in Canada (C\$ 5,062; US\$ 4,915) is much less than that reported in the US (US\$ 9,955), admissions involving hysterectomy were found to be the most expensive in both studies¹⁰. In our study, even though hysterectomy cases accounted for only 30% of admissions, they accounted for nearly half of the total costs of hospital-associated care in our study period. This is consistent with observation made in other studies that hysterectomy is the most expensive surgical procedure performed for endometriosis and forms a sizeable component of the direct costs of care⁸.

The high costs of hysterectomy may be associated with longer lengths of stay compared with non-hysterectomy procedures for endometriosis. However, with the ongoing change in practice from laparotomy to laparoscopy for hysterectomy, costs of hysterectomy have been shown to be

decreasing over time^{22,23}. Other important measures to contain cost may include the use of medical management as first line to avoid the need for surgery¹⁸; and for women requiring surgery, decreasing the length of stay by employing minimally invasive approaches^{24,25}, multimodal analgesia²⁶ or hysterectomy enhanced recovery pathway²⁷.

This study focused only on the hospitalization cost as incurred to the health system, while the costs of emergency room care or outpatient care (eg. physician fees, office costs, investigations and imaging, physiotherapy, consultations with other specialties and allied healthcare providers) are not included. Further, readmissions due to hospital-related complications were not included. As endometriosis increasingly being managed by non-surgical approaches, these non-hospital costs are expected to increase over time. Also, other direct cost borne by the patient for associated outpatient visits, prescription medicines, and transportation are also not described in this study. The indirect, non-healthcare costs of lost productivity related to work impairment, daily functions, and reproductive potential - which have been found to exert a greater toll than direct cost in many studies – have also not been included^{4,7}. The preponderance of endometriosis in young, socially and economically active women of reproductive age has resulted in higher costs of this disease to individuals, families, and society^{5,28}.

The use of the CIHI-DAD is a major strength of this study, as it is a population-based national database with strong quality control mechanism in place and periodic data validation²⁹⁻³¹. Because of the use of CIHI-DAD, we were able to comprehensively capture consecutive admissions for endometriosis, thereby reducing selection bias. The use of standardized, validating coding systems for diagnoses and procedures also helped to reduce information bias.

One limitation of this study is the absence of Quebec data from our study cohort. As the province of Quebec captures hospital admissions using a different database with differences in methodology. As such, the total cost calculated in this study represents that of the other

provinces and territories combined and is below the overall national cost¹³. Though it is possible that disease prevalence and surgical practices may vary across the country, our study does not include the province or territory of hospitalization.

Also, even though the use of ICD codes is well-described in population-based studies, the ICD code for endometriosis of the uterus (N800) can refer to both superficial serosal endometriosis, deeply infiltrating endometriosis involving the uterus, or uterine adenomyosis. As these disease subtypes represent different clinical entities in the gynecologic community, there is a need to revisit the ICD classification to better reflect the clinical experiences of clinicians who manage patients with endometriosis^{32,33}.

Finally, one limitation of comparing costs across different countries, using different currencies, and spanning long time periods, is the effect of shifting currency exchange rates over time.

However, as a reference point using the mid study period (2010), the average currency exchange rates were C\$ 1 = US\$ 0.984 = €0.744.

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CONCLUSION

The hospital cost associated with endometriosis was approximately C\$ 30 million (US\$ 29.13 million) per year for 2008-2013. Though this study focuses specifically on hospital admission and does not account for outpatient costs or indirect costs, this study nonetheless highlights the economic burden of this debilitating disease on Canadian society.

ACKNOWLEDGEMENTS

Authors are grateful to Nicole Sheridan and Gigi Huang for providing administrative support to the authors in conducting study and refining the article. Innie Chen is supported by a University of Ottawa Clinical Research Chair in Reproductive Population health and Health Services, the

Canadian Institutes for Health Research, and Physicians' Services Incorporated Foundation to conduct this research.

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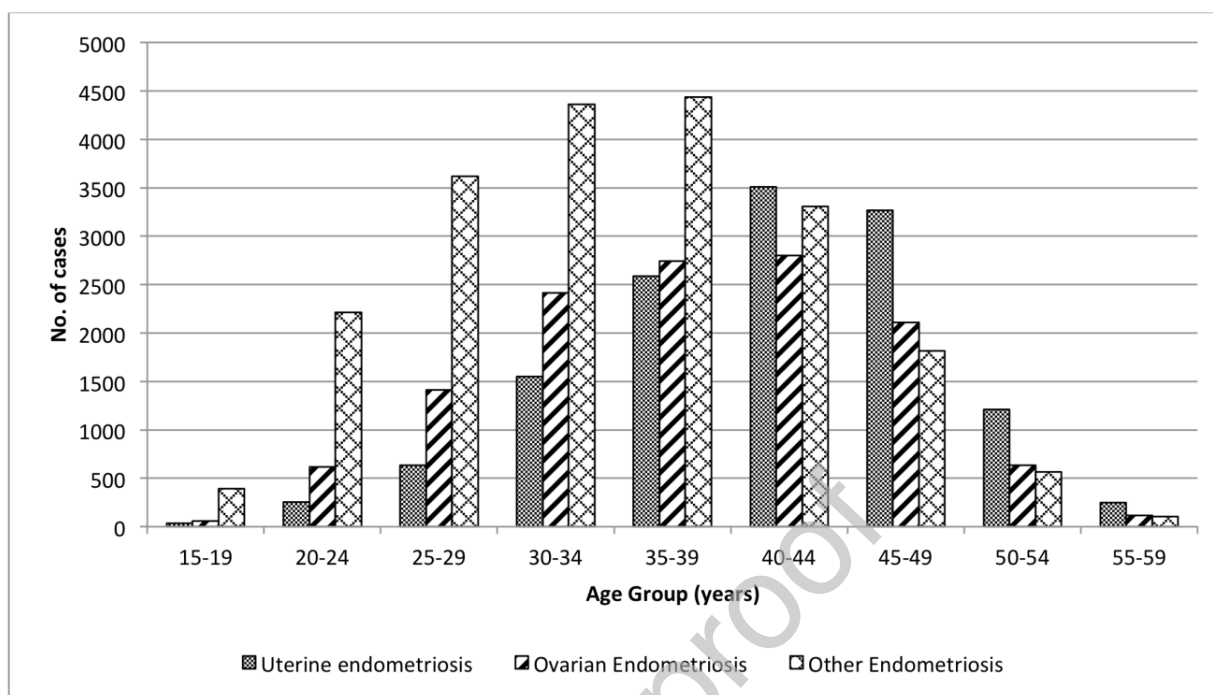
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Figure 1. Distribution of cases of endometriosis in each diagnostic category by age group, Canadian Institute for Health Information DAD, 2008-2013

Table 1: International comparison of cost of treatment of endometriosis – based on published studies

Author (Year)	Country	Number of patients	Cost measured	Direct health care cost ^a	Direct non-health care cost ^b	Indirect cost
Levy et al 2011 ¹²	Canada	27	Cost per patient per year	C\$ 853 (U\$ 862)	C\$ 311 (U\$ 314) ^c	C\$ 4,043 (U\$ 4,048) ^d
Gao et al 2006 ¹¹	USA	Total number: Not provided AH: 47,828 LAVH: 9,991 VH: 8,414	Cost of hospitalization due to endometriosis	U\$ 12,644 (All procedures) U\$ 12,223 (AH) U\$ 13,302 (LAVH) U\$ 9,775 (VH)		
Fuldeore et al 2011 ⁸	USA	Total endometriosis: 15,891 AH: 1,010	Endometriosis related surgical procedures cost within one year of diagnosis	U\$ 11,397 (AH)		

		VH: 217 TH: 2,738 DL: 283		U\$ 8,568 (VH) U\$ 6,856 (TL) U\$ 4,289 (DL)	
Fuldeore et al 2015 ⁹	USA	37,570	Annual healthcare cost within one year of diagnosis	U\$ 13,199 (Total Healthcare cost) U\$ 12,005 (All- cause medical service) U\$ 4,909 (Inpatient visit) U\$ 6,729 (Outpatient visit) U\$ 368 (ER visit)	
Soliman et al 2017 ¹⁰	USA	Patients with endometriosis related surgery: 124,530	Cost for 12 months after diagnosis of endometriosis	U\$ 18,881 (All cause) U\$ 8,417 (Endometriosis related) U\$ 9,995 (Hysterectomy) U\$ 12,794 (Oophorectomy) U\$ 8,592 (Laparotomy)	U\$ 6,237 ^e
		Patients with no endometriosis related surgery: 37,106		U\$ 7,103 (All cause) U\$ 275 - Endometriosis related	U\$ 4,781
Oppelt et al 2006 ³⁴	Germany	21,244	Hospital cost per patient to funding bodies	€ 3,056 (U\$ 3,836)	
Taipale et al 2009 ⁷	Finland	20	Mean hospital cost at 6 months among patients with endometriosis underwent hysterectomy	€ 3,114 (U\$ 4,324)	
Simoens et al 2011 ³⁵	Belgium	n=180	Productivity loss		€ 1,514 (U\$ 2,107) (6 months prior to treatment) + € 2,496 (U\$ 3,474) (6 months after treatment)
			Cost of Household activities		€ 982 (U\$ 1,367) (6 months prior to treatment) + € 981 (U\$ 1,365) (6

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						months after treatment)
Simoens et al 2012 ⁵	10 countries (Belgium, Denmark, France, Germany, Hungary, Italy, Netherland, Switzerland, UK, USA)	909	Annual cost of endometriosis associated symptoms	€ 3,113 (US\$ 4,001)	€ 168 (US\$ 216) ^f	€ 6,298 (US\$ 8,096) ^e
Prast et al 2013 ⁶	Austria	73	Annual cost of endometriosis	€ 4,712 (US\$ 6,259)	€ 894 (US\$ 1,188)	€ 2,106 (US\$ 2,798)
Klein et al 2014 ⁴	Belgium	134	Annual cost of endometriosis associated symptoms	€ 2,238 (US\$ 2,973)	€ 200 (US\$ 266) ^f	€ 7434 (US\$ 9,875) ^e

Abbreviations: AH: Abdominal Hysterectomy, LAVH: Laparoscopic assisted vaginal hysterectomy, VH: Vaginal hysterectomy, TL: Therapeutic laparoscopy, DL: Diagnostic laparoscopy

^a Direct health care cost: public payer/insurance claim

^b Direct non-health care cost: patient/other cost

^c Prescription/over the counter medications, alternative health care provider visits, paid caregiver/relief

^d Lost productivity + lost leisure time

^f Transportation, support household activities

^e Productivity/Work loss

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Table 2. Distribution of cost per weighted case and total hospital-related costs for each diagnostic category by age group, Canadian Institute for Health Information DAD, 2008-2013

Age (years)	Uterine endometriosis			Ovarian endometriosis			Other endometriosis			Total		
	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)
15-19	38 (0.29)	\$ 1,187	45,106 (0.08)	61 (0.47)	\$ 2,099	128,039 (0.28)	394 (1.89)	\$ 1,356	534,264 (1.03)	493 (1.05)	\$ 1,435	707,586 (0.46)
20-24	252 (1.89)	\$ 1,594	401,688 (0.73)	617 (4.78)	\$ 2,741	1,691,197 (3.74)	2,213 (10.63)	\$ 1,558	3,447,854 (6.64)	3,082 (6.55)	\$ 1,798	5,540,968 (3.64)
25-29	637 (4.79)	\$ 2,653	1,689,961 (3.07)	1,411 (10.94)	\$ 2,800	3,950,800 (8.73)	3,621 (17.39)	\$ 1,856	6,720,576 (12.94)	5,669 (12.06)	\$ 2,181	12,362,833 (8.12)
30-34	1,551 (11.66)	\$ 3,241	5,026,791 (9.13)	2,413 (18.70)	\$ 2,900	6,997,700 (15.47)	4,363 (20.96)	\$ 2,004	8,743,452 (16.83)	8,327 (17.71)	\$ 2,494	20,767,439 (13.64)
35-39	2,588	\$ 3,82	9,891,336	2,743	\$ 3,34	9,183,564	4,434	\$ 2,51	11,164,812	9,765	\$ 3,09	30,238,131

	(19.4 5)	2	(17.97)	(21.2 6)	8	(20.30)	(21.3 0)	8	(21.50)	7	7	(19.87)
40-44	3,507 (26.36)	\$ 4,481	15,714,867 (28.55)	2,798 (21.69)	\$ 4,386	12,272,028 (27.13)	3,307 (15.89)	\$ 3,633	12,014,331 (23.13)	9,612 (20.44)	\$ 4,162	40,000,557 (26.28)
45-49	3,267 (24.56)	\$ 4,744	15,498,648 (28.16)	2,110 (16.36)	\$ 3,821	8,062,310 (17.82)	1,816 (8.72)	\$ 3,457	6,277,912 (12.09)	7,193 (15.30)	\$ 4,148	29,836,400 (19.60)
50-54	1,212 (9.11)	\$ 4,678	5,669,736 (10.30)	633 (4.91)	\$ 3,902	2,469,966 (5.46)	567 (2.72)	\$ 4,726	2,679,642 (5.16)	2,412 (5.13)	\$ 4,485	10,818,936 (7.11)
55-59	251 (1.89)	\$ 4,384	1,100,384 (2.00)	115 (0.89)	\$ 4,157	478,055 (1.06)	102 (0.49)	\$ 3,549	361,998 (0.70)	468 (1.00)	\$ 4,146	1,940,391 (1.27)
Total	13,303 (28.29)	\$ 4,137	55,034,511 (36.16)	12,901 (27.44)	\$ 3,506	45,230,906 (29.72)	20,817 (44.27)	\$ 2,495	51,938,415 (34.12)	47,021 (100.00)	\$ 3,237	152,206,977 (100.00)

* All \$ amount in the table are C\$

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Table 3. Distribution of cost per weighted case and total hospital-related costs for each intervention category by age group, Canadian Institute for Health Information DAD, 2008-2013

Age (years)	Hysterectomy			Other surgical procedures			No surgical procedure			Total		
	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)	N (%)	CPW C	Total cost (%)
15-19	0 (0.00)	N/A	-	481 (1.48)	\$ 1,430	687,830 (0.85)	12 (1.90)	\$ 1,630	19,560 (1.43)	493 (1.05)	\$ 1,435	707,455 (0.46)
20-24	24 (0.17)	\$ 4,165	99,960 (0.14)	2,977 (9.16)	\$ 1,770	5,269,290 (6.55)	81 (12.80)	\$ 2,110	170,910 (12.48)	3,082 (6.55)	\$ 1,798	5,541,436 (3.64)
25-29	367 (2.64)	\$ 5,334	1,957,578 (2.78)	5,184 (15.96)	\$ 1,958	10,150,272 (12.62)	118 (18.64)	\$ 2,158	254,644 (18.59)	5,669 (12.06)	\$ 2,181	12,364,089 (8.12)
30-34	1,228 (8.83)	\$ 4,832	5,933,696 (8.43)	6,985 (21.50)	\$ 2,092	14,612,620 (18.16)	114 (18.01)	\$ 1,977	225,378 (16.45)	8,327 (17.71)	\$ 2,494	20,767,538 (13.64)
35-39	2,737 (19.68)	\$ 4,818	13,186,866 (18.73)	6,917 (21.29)	\$ 2,428	16,794,476 (20.87)	111 (17.54)	\$ 2,332	258,852 (18.90)	9,765 (20.77)	\$ 3,097	30,242,205 (19.87)
40-44	4,155 (29.88)	\$ 5,138	21,348,390 (30.33)	5,365 (16.52)	\$ 3,439	18,450,235 (22.93)	92 (14.53)	\$ 2,204	202,768 (14.80)	9,612 (20.44)	\$ 4,162	40,005,144 (26.28)

45-49	3,740 (26.90)	\$ 5,208	19,477,920 (27.67)	3,361 (10.35)	\$ 3,024	10,163,664 (12.63)	92 (14.53)	\$ 2,130	195,960 (14.31)	7,193 (15.30)	\$ 4,148	29,836,564 (19.60)
50-54	1,388 (9.98)	\$ 5,058	7,020,504 (9.97)	1,011 (3.11)	\$ 3,716	3,756,876 (4.67)	13 (2.05)	\$ 3,187	41,431 (3.02)	2,412 (5.13)	\$ 4,486	10,820,232 (7.11)
55-59	266 (1.91)	\$ 5,123	1,362,718 (1.94)	202 (0.62)	\$ 2,860	577,720 (0.72)	0 (0.00)	-	-	468 (1.00)	\$ 4,146	1,940,328 (1.27)
Total	13,905 (29.57)	\$ 5,062	70,387,110 (46.24)	32,483 (69.08)	\$ 2,477	80,460,391 (52.86)	633 (1.35)	\$ 2,164	1,369,812 (0.90)	47,021 (100.00)	\$ 3,237	152,206,977 (100.00)

* All \$ amount in the table are C\$

Table 4. Distribution of cost per weighted case and total hospital-related costs for each diagnostic category by intervention category, Canadian Institute for Health Information DAD, 2008-2013

Procedures	Uterine endometriosis			Ovarian endometriosis			Other endometriosis			Total		
	N (%)	CP WC	Total cost (%)	N (%)	CP WC	Total cost (%)	N (%)	CP WC	Total cost (%)	N (%)	CP WC	Total cost (%)
Hysterectomy	8,685 (65.29)	\$ 5,087	44,180,595 (80.28)	2,105 (16.32)	\$ 5,020	10,567,100 (23.36)	3,115 (14.96)	\$ 5,021	15,640,415 (30.11)	13,905 (29.57)	\$ 5,062	70,387,110 (46.24)
Other surgical procedures	4,511 (33.91)	\$ 2,356	10,627,916 (19.31)	10,667 (82.68)	\$ 3,224	34,390,408 (76.03)	17,305 (83.13)	\$ 2,048	35,440,640 (68.24)	32,483 (69.08)	\$ 2,477	80,460,391 (52.86)
No surgical procedure	107 (0.80)	\$ 2,129	227,803 (0.41)	129 (1.00)	\$ 2,127	274,383 (0.61)	397 (1.91)	\$ 2,185	867,445 (1.67)	633 (1.35)	\$ 2,164	1,369,812 (0.90)
Total	13,303 (28.29)	\$ 4,137	55,034,511 (36.16)	12,901 (27.44)	\$ 3,506	45,230,906 (29.72)	20,817 (44.27)	\$ 2,495	51,938,415 (34.12)	47,021 (100.00)	\$ 3,237	152,206,977 (100.00)

* All \$ amount in the table are C\$