

Social determinants of access to timely elective surgery in Ontario, Canada: A cross-sectional population level study

Abstract

Background: There is a gap in understanding the relationship between structural social disadvantage and surgical wait times in Canada.

Methods: Linked administrative databases were analyzed in a cross-sectional study of persons older than 18 receiving one of seven planned surgical procedures. Our primary outcome of interest was exceeding target wait times, and the exposures were dimensions of social and economic marginalization as measured by the 2016 neighbourhood-level Ontario Marginalization Index.

Results: Of the 1,385,673 procedures included in the analysis, 174,633 (12.6%) exceeded the target wait time. Adjusted analysis of marginalization domains for cataract surgery found a significant risk of exceeding wait time for higher residential instability (aOR 1.23, CI95% 1.19 - 1.27), and recent immigration (aOR 1.11, CI95% 1.08 - 1.15). The highest deprivation quintile was associated with a 22% (aOR 1.22, CI95% 1.16 - 1.27) and 21% (aOR 1.21, CI95% 1.14 - 1.29) increased risk of exceeding wait time for knee and hip arthroplasty respectively. In contrast, residence in areas with increased visible minority populations was independently associated with reduced risk of exceeding target wait times for hip arthroplasty (aOR 0.81, CI95% 0.74 – 0.88), cholecystectomy (aOR 0.69, CI95% 0.58 – 0.81) and hernia repair surgery (aOR 0.65, CI95% 0.56 – 0.76) but had the opposite effect in benign uterine surgery (aOR 1.26, CI95% 1.16 - 1.36).

Interpretation: Our analysis suggests that structural disadvantage has a small and inconsistent impact on the risk of receiving care within surgical wait time targets in Ontario.

Keywords: Social determinants; Health Systems; Surgical Care; Universal Healthcare;

1 the majority, followed by knee arthroplasty, hip arthroplasty, benign uterine surgery and knee
2 arthroscopy. We further excluded urgent procedures and procedures with missing data. The
3 STROBE guidelines are followed in presenting our analysis.(6)

4 Data Sources

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7 Surgical procedures were identified in the Wait Times Information System (WTIS) database,
8 which provides standardized wait time tracking for most non-urgent surgeries in Ontario and
9 is administered by Ontario Health, an agency created by the Government of Ontario with a
10 mandate to connect and coordinate the province's health care system. Individual-level
11 demographic and residence data were obtained from the Registered Persons Database
12 (RPDB) and area-level sociodemographic data from the 2016 Canadian Census of
13 Population. Comorbidity was classified using Aggregated Diagnosis Groups (ADGs)
14 calculated with The Johns Hopkins ACG® System Version 10 software, based on subjects'
15 health care utilization records in the Discharge Abstract Database, Same-Day Surgery
16 Database, and Ontario Health Insurance Plan database. These datasets were linked using
17 unique encoded identifiers and analyzed at ICES, a not-for-profit research institute
18 encompassing a community of research, data and clinical experts, whose legal status under
19 Ontario's health information privacy law allows it to collect and analyze health care and
20 demographic data, without consent, for health system evaluation and improvement.

21 Outcome and Exposure

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24 The primary outcome in this analysis was exceeding target wait times for seven common
25 surgical procedures (knee arthroplasty, hip arthroplasty, knee arthroscopy, benign uterine
26 surgery, cataract surgery, inguinal hernia repair and cholecystectomy). These seven surgical
27 procedures constituted 45% off all procedures performed in Ontario between April 2013 and
28 December 2019. Target wait times were predefined based on provincial surgical access
29 targets. For the procedures studied, the target wait time for 'priority level 3' (semi-urgent
30 cases) was 84 days or less, and for 'priority level 4' (elective cases), 182 days or less. We
31 generated a binary dependent variable based on these target wait times (within or exceeding
32 target wait time). Wait time was defined as the time between the clinical decision to proceed
33 with surgical treatment and the date of surgery, subtracting any patient-related delays such as
34 undergoing another procedure, change in medical status, patient deferral, etc.

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The exposures of interest were the dimensions (sub-domains) of marginalization as measured by the 2016 Ontario Marginalization Index (ON-Marg). ON-Marg was developed using factor analysis of forty-two 2016 Canadian Census indicators. It is a multi-dimensional validated composite measure of a group of individuals' ability to participate in society. (7) ON-Marg consists of four sub-domains: residential instability, material deprivation, dependency and ethnic diversity. Residential instability is a concentration index of family or housing stability and relates to neighbourhood cohesiveness, quality, and support. Material deprivation closely relates to poverty and includes income and educational level measures. The dependency index measures the concentration of individuals who do not receive income from employment, including seniors, children and adults who are unable to work or are not compensated. Finally, ethnic diversity and recent immigrants measures the proportion of residents who self-identify as being in a visible minority group or who have immigrated in the last five years. (8) ON-Marg is calculated for each Dissemination Area (DA) a small, stable geographic unit with a typical population of between 400 and 700 individuals, and is an appropriate surrogate measure for person-level marginalization. (8) Given the multi-dimensional nature of ON-Marg, it provides a measure of both the structural and intermediate determinants of health disparities. (9) To categorize levels of marginalization, all DAs in Ontario were ranked within each domain (or sub-domain) and assigned to a quintile, with quintile 1 representing the DAs with the lowest marginalization and quintile 5 the highest. For recent immigration, the high frequency of zeros led to creation of only three categories (i.e., the lower three quintiles combined, and the fourth and fifth quintiles).

Statistical Analysis

The procedure and patient characteristic distributions were compared for priority level 3 or 4 and for surgery completed within or exceeding target wait times. Covariates included patient age; sex; comorbidity score (the sum of ADGs); surgical priority level 3 or 4; rural or urban patient residence; geographic region of residence; DA-level income quintile; hospital teaching status, and year of procedure. For each surgery type, the association between area-level determinants and exceeding wait target was tested for linear trend using the Cochran-Armitage test. The association between each covariate and the outcome was estimated using logistic regression models. Age and comorbidity score were modelled as continuous variables using restricted cubic splines. Each covariate was modelled separately to generate unadjusted odds ratios (ORs), except for the main exposures which were adjusted for region to account

1 for more marginalized DAs being clustered in large cities. Adjusted ORs were estimated
2 using logistic models that included all covariates. Models were tested for multicollinearity.
3 Interaction analysis showed statistically significant effect sizes for interactions between
4 surgery type and main exposures; therefore, each of the seven procedure types were modelled
5 separately.

6 **Results**

7 Figure 1 provides a summary of the study flow chart and exclusions. Of the 1,385,673
8 procedures included in the analysis, 174,633 (12.6%) exceeded the target wait time. Table 1
9 describes procedures exceeding wait time by patient characteristics and priority level.
10 Compared to priority 4, priority 3 procedures were more likely to exceed wait time targets.
11 There was a trend towards increased wait time with increased age category and year of
12 procedure. Compared to the 7.5% of patients between the ages of 18 and 49, 15.8% of
13 patients over the age of 80 years exceeded the surgical wait time target. Overall, 10.4% of
14 procedures in 2013 exceeded wait time targets, compared with 14.6% in 2017 and 13.8% in
15 2019. Priority 4 procedures done in non-teaching hospitals were less likely to exceed wait
16 time targets (9.9%) than those done at teaching hospitals (14.3%). Similarly, a higher
17 proportion of priority 4 procedures done in rural areas exceeded wait time targets (14.0%)
18 compared to urban areas (10.6%), and patients from Northern (14.7%) and Western (16.9%)
19 Ontario had a higher proportion of procedures exceeding wait time compared to patients from
20 Toronto (8.8%). Between different procedures, there was significant variability in exceeding
21 wait time targets, from 2.1% for priority 4 cholecystectomy to 40.1% for priority 3 knee
22 arthroplasty.

23 Association of marginalization with prolonged wait times

24 There was little variation in the proportion of patients exceeding wait-time targets according
25 to quintiles of dependency (11.0 – 13.8%), deprivation (12.1 – 12.8%), or instability (11.7 –
26 13.1%, Table 2). Persons residing in communities with more individuals who immigrated
27 within the last five years had lower rates of exceeding wait time (10.8% versus 13.4%), as did
28 persons from communities with more residents identifying as visible minority (9.6% versus
29 14.8%), particularly for priority level 4 procedures (7.8% versus 13.4%). Tests of trend were
30 highly significant ($p < 0.001$) across the levels of recent immigration and visible minority
31 population, for all surgery types.

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1 Analysis of factors associated with prolonged surgical wait times for cataracts and benign
2 uterine surgery is presented in Table 3. For cataract surgery, compared to patients of age 40,
3 older age was significantly associated with an increased adjusted odds of exceeding wait time
4 by 10%, 33%, 63% and 86% for patients aged 50, 60, 70, and 80 years, respectively.
5 Procedures that were performed in women, those categorized as priority 3, and those
6 performed in patients from rural areas were also significantly associated with exceeding
7 target wait times for cataract surgery. In contrast, increased comorbidity scores were
8 associated with reduced risk of exceeding waiting times for cataract surgery. There was an
9 increased risk of exceeding cataract target surgical wait time for 2014 – 2019 compared to
10 2013. The adjusted odds ratio peaked in 2017 aOR 2.54 (CI95% 2.46 - 2.62), reducing to
11 aOR 2.22 (CI95% 2.15 - 2.30) in 2019. Compared to Toronto, residents in Ontario's Western,
12 Eastern and Greater Toronto and Hamilton Area (GTHA) regions had higher adjusted risk of
13 exceeding wait time targets. Adjusted analysis of marginalization domains found a significant
14 risk of exceeding wait time for instability quintiles 4 (aOR 1.14, CI95% 1.11 - 1.18) and 5
15 (aOR 1.23 CI95% 1.19 - 1.27), and recent immigration quintile 2 (aOR 1.04, CI95% 1.01 -
16 1.06) and 3 (aOR 1.11, CI95% 1.08 - 1.15) (Table 3 and Figure 2). Increased dependency and
17 deprivation quintiles had a reduced adjusted risk of exceeding cataract surgical wait times.
18 Further, there appeared to be a weak dose response with decreasing risk of exceeding wait
19 times from aOR 0.94 (CI95% 0.91 - 0.96) to aOR 0.81 (0.79 - 0.84) for dependency and from
20 aOR 0.90 (CI95% 0.88 - 0.92) to aOR 0.74 (CI95% 0.72 - 0.76) for deprivation quintile 2 to
21 5, respectively.

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23 In contrast to cataract surgery, increasing age was associated with a lower risk of exceeding
24 the target wait time for benign uterine surgery from aOR 0.90 (CI95% 0.88 - 0.92) to aOR
25 0.47 (CI95% 0.42 - 0.52) for ages 50 and 80 years compared to age 40 years. Compared to
26 Toronto, residents in other regions of Ontario, particularly Northern Ontario (aOR 4.59
27 CI95% 4.25 - 4.96), were all significantly associated with an increased risk of exceeding
28 target wait times. There was also a strong association between priority level 4 versus 3 (aOR
29 4.76, CI95% 4.60 - 4.93) and patients receiving care in a teaching hospital (aOR 2.16, CI95%
30 2.09 - 2.24) compared to a non-teaching facility in exceeding target wait times for benign
31 uterine surgery. A smaller but statistically significant association was found between visible
32 minority and recent immigration status and odds of exceeding wait time.
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1 For knee and hip arthroplasty, priority level and deprivation quintile were associated with
 2 increased risk of exceeding wait time targets (Table 4). Deprivation quintile 5 was associated
 3 with a 22% (aOR 1.22, CI95% 1.16 - 1.27) and 21% (aOR 1.21, CI95% 1.14 - 1.29)
 4 increased odds of exceeding wait time for knee and hip arthroplasty respectively (Figure 3
 5 and Table 4). Older age was associated with increased risk for knee, but decreased risk for
 6 exceeding the target wait time for hip arthroplasty. Compared to Toronto, all other regions of
 7 Ontario had significantly increased risk of exceeding wait times ranging from aOR 1.89
 8 (CI95% 1.78 - 2.01) to aOR 1.82 (CI95% 1.69 - 1.97) in Eastern Ontario and aOR 6.87
 9 (CI95% 6.51 - 7.25) to aOR 4.79 (CI95% 4.45 - 5.15) in Western Ontario for knee and hip
 10 arthroplasty, respectively. Teaching hospitals were also associated with significantly
 11 increased likelihood (46% and 72% for knee and hip arthroplasty) of exceeding wait time
 12 targets. Visible minority quintile was associated with a reducing trend in the adjusted risk of
 13 exceeding the target wait time for hip arthroplasty from 6% (aOR 0.94, CI95% 0.90 - 0.99)
 14 for quintile 2 to 19% (aOR 0.81, 0.74 - 0.88) for quintile 5. Similar to knee arthroplasty, knee
 15 arthroscopy patients were more likely to exceed wait times with increased priority (aOR 3.49,
 16 CI95% 3.34 - 3.63) or having the procedure in a teaching hospital (aOR 1.27, CI95% 1.21 -
 17 1.34), or a region outside Toronto (ranging from aOR 1.56 CI95% 1.44 - 1.69 for the GTHA
 18 to aOR 2.85, CI95% 2.61 - 3.11 for Eastern Ontario). Deprivation quintile 2 was associated
 19 with a 9% (aOR 1.09, CI95% 1.03 - 1.16) increased risk of exceeding arthroscopy wait times,
 20 increasing to 20% (aOR 1.20, CI95% 1.12 - 1.30) for deprivation quintile 5 (Figure 3). Older
 21 patients and those from rural 0.75 (0.70, 0.80) areas were less likely to exceed arthroscopy
 22 wait times.

23
 24 Unadjusted analysis suggested increased risk of exceeding cholecystectomy wait times for
 25 higher dependency, deprivation and instability quintiles (Table 5). After adjusting for
 26 covariates, only the increased deprivation quintile remained statistically significant with a
 27 16% 1.16 (1.05, 1.29) to 33% 1.33 (1.19, 1.49) increased risk from quintile 2 to quintile 5.
 28 Visible minority quintile 4 and 5 was associated with reduced risk of exceeding wait time for
 29 both cholecystectomy and inguinal hernia repair. Similarly, age 80 years was associated with
 30 a 21% (aOR 0.79, CI95% 0.70 - 0.89) and 22% (aOR 0.78, 0.71 - 0.86) reduced risk for both
 31 cholecystectomy and inguinal hernia repair exceeding target wait time, compared to age 40
 32 years. In contrast to arthroplasty and cataract surgery, there was a similar or reduced odds of
 33 exceeding wait time between 2014 – 2019 compared to 2013 for both cholecystectomy and
 34 inguinal hernia repair. Although rural areas were associated with reduced risk, Western (aOR

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3 1 1.47, CI95% 1.29 - 1.67; aOR 1.39 CI95% 1.23 - 1.58) and Northern (aOR 2.32, CI95% 1.99
4 - 2.71; aOR 2.01, CI95% 1.73 - 2.34) Ontario had significantly increased risk of exceeding
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6 3 wait times for both cholecystectomy and inguinal hernia repair respectively. Consistent with
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8 4 analysis for other procedures, cholecystectomy and inguinal hernia repair with increased
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10 5 priority level and conducted in teaching hospitals were at increased risk of exceeding target
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12 6 wait times.

7 8 **Discussion:**

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10 Our analysis of 1,385,673 scheduled surgical procedures conducted between 2013 and 2019
11 in Ontario, Canada, demonstrated a complex relationship between social and economic
12 marginalization and exceeding target surgical wait time targets for seven common elective
13 surgical procedures. Except for cataract and inguinal hernia surgery, increased material
14 deprivation was significantly and independently associated with exceeding target wait times.
15 By contrast, residence in areas with increased visible minority populations was independently
16 associated with reduced risk of exceeding target wait times for arthroplasty, cholecystectomy
17 and hernia repair surgery but had the opposite effect on benign uterine surgery. Geographic
18 disparities in wait time were consistently found across all seven procedures, with patients
19 from regions outside Toronto having a significantly higher probability of exceeding target
20 wait times. These findings could be explained by differences in resource distribution access
21 geographic regions in Ontario.

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23 In comparison, studies from the US (10–13), Australia and New Zealand (14–16) have
24 generally found non-white race and health-insurance status to be associated with increased
25 surgical wait times. In particular, minority groups had longer wait times for arthroplasty(10)
26 and cholecystectomy(16). International studies demonstrate that while dual public-private
27 financed hospital care leads to increased consumer choice, there are deleterious effects on
28 health equity in both low-resource (17–19) and high-resource nations (20,21). Hospital care
29 in Canada is financed through a single-payer publicly financed system. Access to the surgical
30 procedures considered in this analysis are therefore free at the point of use, eliminating an
31 important barrier to access care for poor, vulnerable or marginalized groups (22). The
32 healthcare system itself functions as an important intermediate social determinant of health
33 outcomes. Our analysis suggests that, once an individual has been diagnosed and assessed as
34 requiring surgery, eliminating the cost-barrier to care can ameliorate the downstream effects
35 of structural determinants.

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3 1 Increased dependency was associated with a slightly reduced probability of exceeding wait
4 2 time for hip arthroplasty and cataract surgery. Cataract surgery was the only procedure
5 3 associated with an increased risk of exceeding target wait time for higher instability quintiles.
6 4 Where a significant and independent association was found between marginalization
7 5 subdomains and wait times, our analysis suggests a weak dose-response. Effect sizes between
8 6 marginalization and wait times were consistently small. Our finding that the relationship
9 7 between marginalization and surgical wait time is influenced by surgical procedure and
10 8 varies by marginalization subdomain is supported by previous studies assessing the
11 9 association between socioeconomic status and surgical wait times in Canada. (23–26)
12 10 Sutherland and colleagues found no relationship between individual-level socioeconomic
13 11 status and surgical wait time for adult general surgery patients in British Columbia, Canada.
14 12 (25) Similarly, after adjusting for covariates, no association was established between
15 13 socioeconomic status and increased clinic referral or surgical wait times for pediatric surgery
16 14 in Ontario. (23) In contrast, a population-based study utilizing linked administrative data and
17 15 adjusting for disease severity and patient characteristics found a 6% increase per
18 16 marginalization quintile in the probability of exceeding surgical wait times for patients with
19 17 endometrial cancer in Ontario.(26)
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21 19 Procedures that were priority level 3, and those that were done in regions outside Toronto, in
22 20 teaching hospitals, and in women were consistently associated with increased risk of
23 21 exceeding wait time targets. Further, the effect sizes of these associations were much larger
24 22 than those for marginalization measures. Except for female sex, these observations could be
25 23 explained by the differences in the organization of services across various geographic
26 24 regions, the clinical complexity of cases treated in teaching hospitals and the fact that the
27 25 target wait times for priority 3 patients are much less than for priority 4 patients (84 vs 182
28 26 days), making it statistically less likely for procedures categorized as priority 3 to occur
29 27 within the wait time target. Interestingly, our adjusted analysis suggests that patients residing
30 28 in rural areas were less likely to exceed wait time targets for all procedures except cataract
31 29 surgery.

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33 31 Our analysis is strengthened by drawing on a large administrative dataset for multiple high-
34 32 volume non-urgent procedures, utilizing validated measures of marginalization, and
35 33 adjustment for multiple confounding variables. Our study should be considered in light of
36 34 some limitations. First, we only assessed the effects of marginalization for a defined period in

1 the patient care continuum, from when the clinical decision to proceed with surgical
2 treatment is taken and the time of surgery (the period of time defined as “Wait 2” in WTIS).
3 Therefore, access to surgical consultation and post-operative follow-up were not analyzed. As
4 a result, it is possible that a biased population—less disadvantaged and better able to navigate
5 the primary care system and access surgical consultation—was included in our analysis.
6 Second, our analysis does not address the impact of marginalization on morbidity or
7 mortality. Third, individual patients were assigned to marginalization quintiles based on
8 community and not individual characteristics. This could create an ecological fallacy, where
9 population-level factors are ascribed to individual subjects and could potentially have caused
10 our analysis to miss true associations between marginalization and wait times. However,
11 extensive literature shows that neighbourhood-level Ontario marginalization index measures
12 are reliable and valid measures of community-level social disadvantage (and are more
13 representative of person-level characteristics when the unit of analysis is small, such as DA),
14 and have detected associations between marginalization and health outcomes in other
15 studies.(8,26–28) Further, there has been increasing awareness about the importance of
16 neighbourhood characteristics and access to health services during the COVID-19 pandemic;
17 even if marginalization measures are more valid for neighbourhoods than for individual
18 persons, we can still draw valid conclusions about the effect of residing in an area with
19 greater social disadvantage on access to care. Fourth, our analysis of wait times as a binary
20 rather than a continuous variable might have obscured relationships between explanatory
21 variables and access to care. However, whether or not a procedure was done within a pre-
22 defined wait time target has clear clinical and policy importance, and is currently tracked as a
23 health system performance measure in Ontario. Finally, the analysis was limited to Ontario
24 and may not be generalizable to other jurisdictions in Canada or elsewhere.

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26 In conclusion, we found marginalization had a limited and inconsistent impact on the risk of
27 receiving care within surgical wait time targets for patients in Ontario. Patients with higher
28 comorbidity burdens and those in rural areas had similar, and possibly, slightly better access
29 to timely non-urgent surgical care. Future research should consider understanding these
30 differences as they relate to the distribution of resources and the organization of clinical
31 service delivery.

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Ethics Approval

This study was approved by the Women's College Hospital and Sunnybrook Health Sciences Centre Research Ethics Boards.

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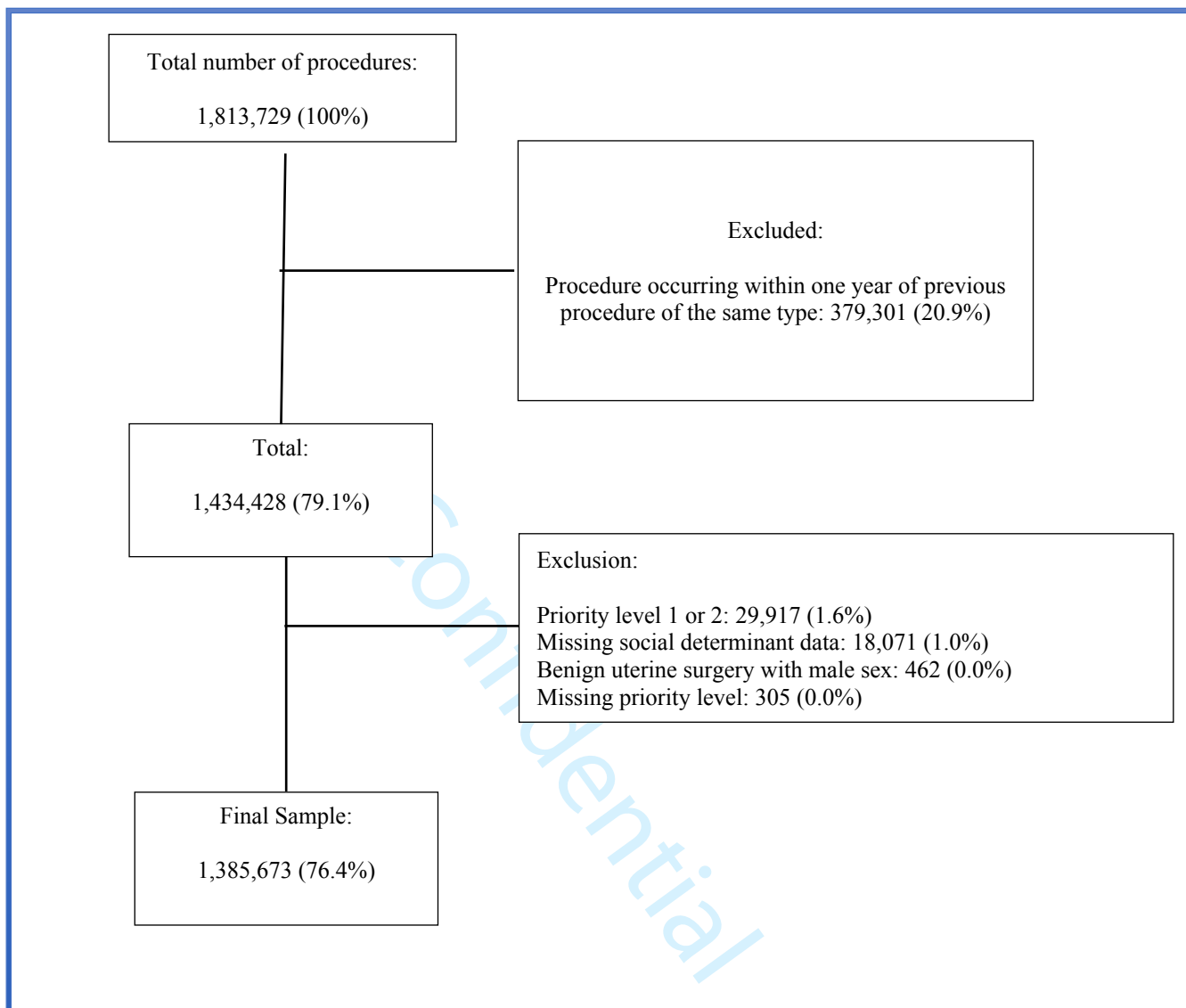
Figure 1: Summary of data management

Figure 2: Forest plot for the association between odds of exceeding surgical wait time targets by marginalization subdomains for cataract and benign uterine surgery

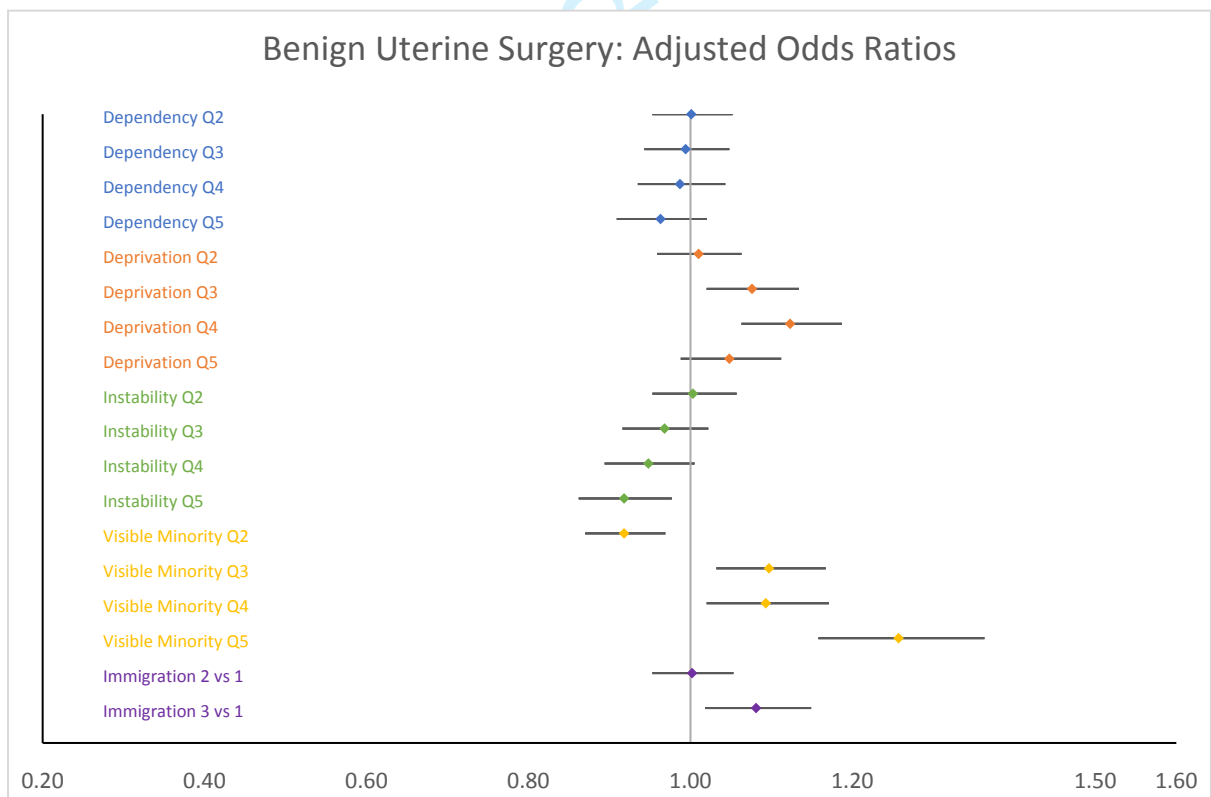
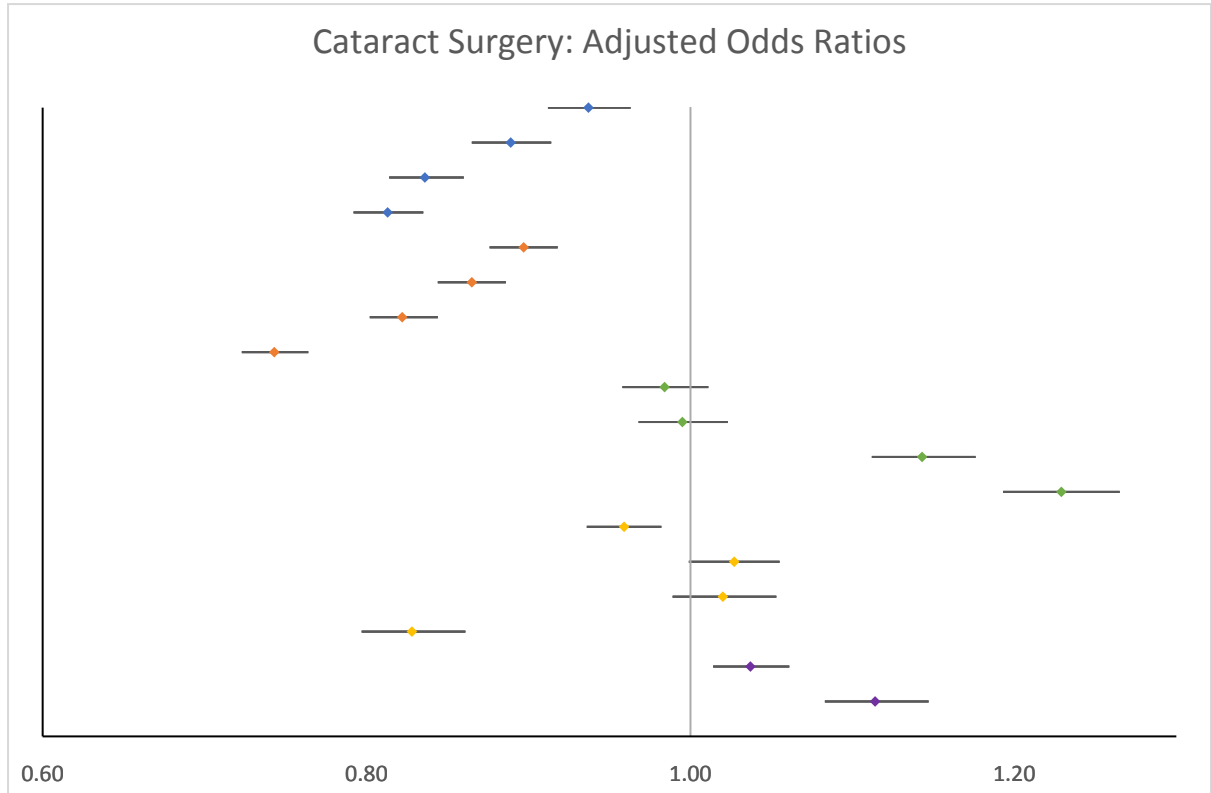
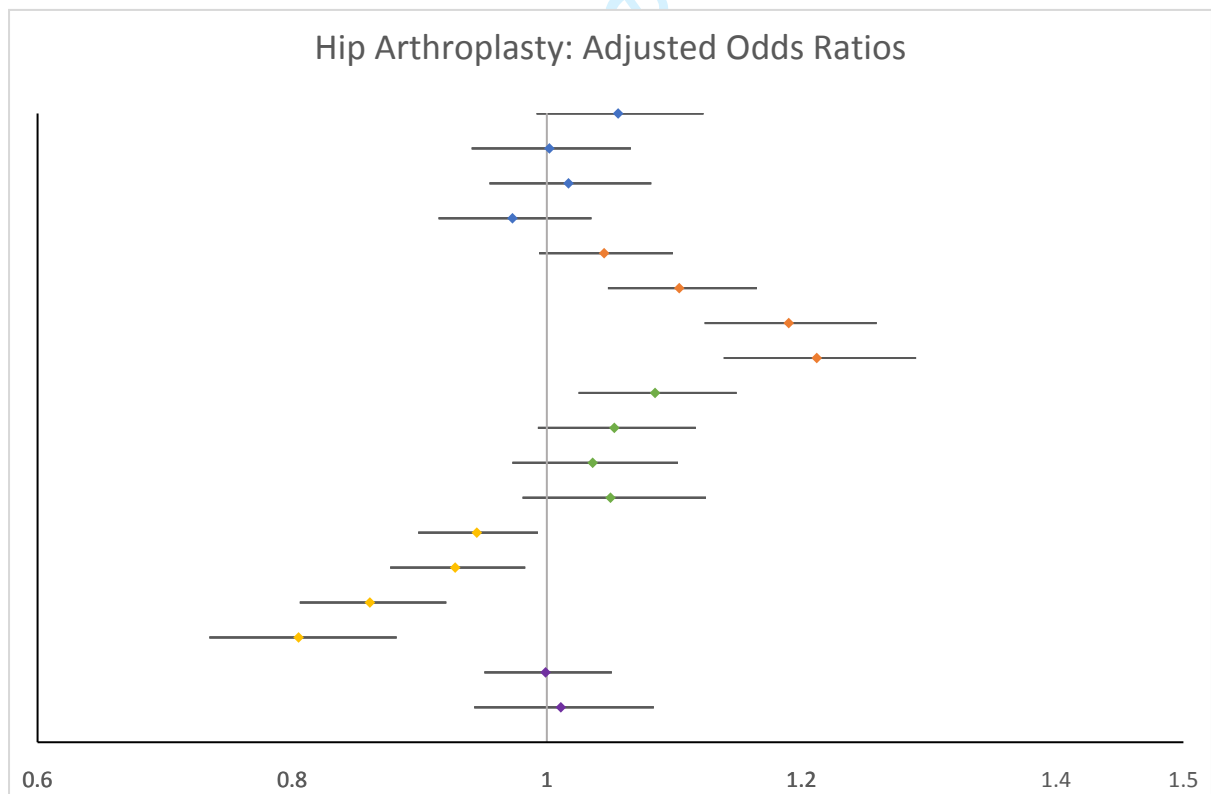
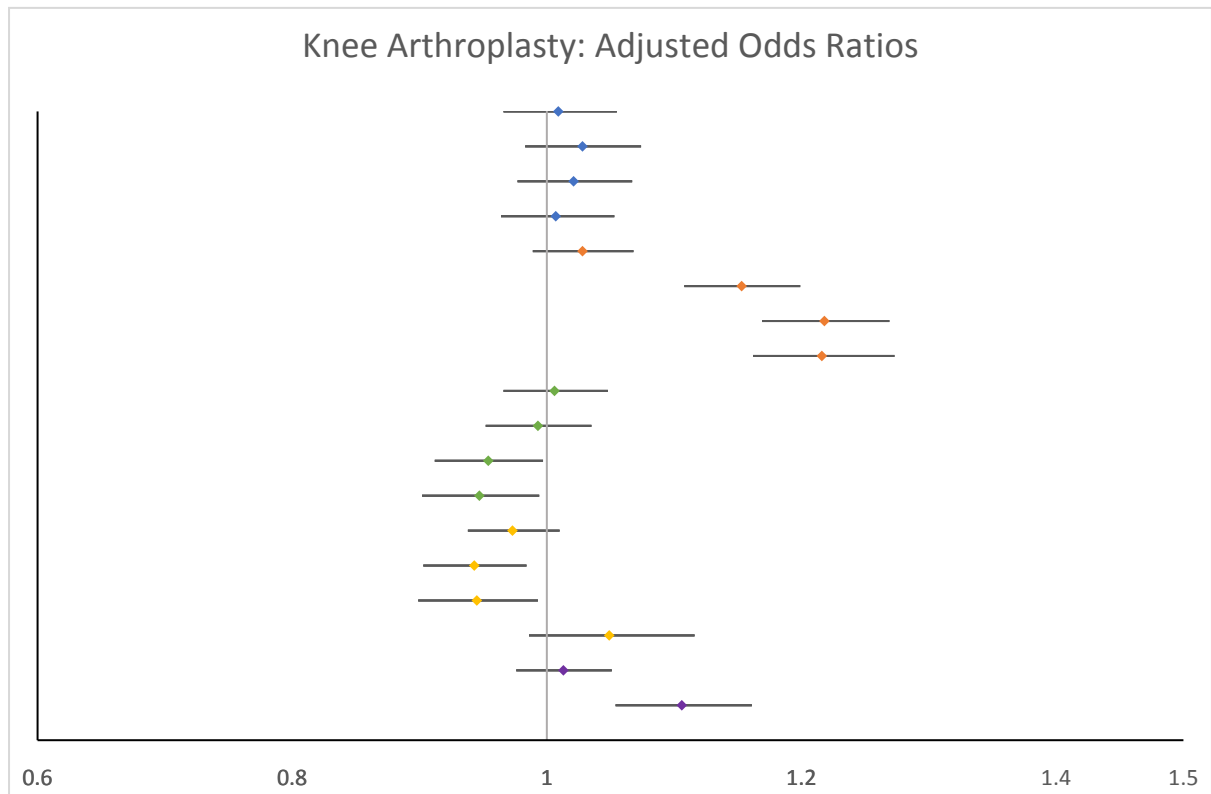
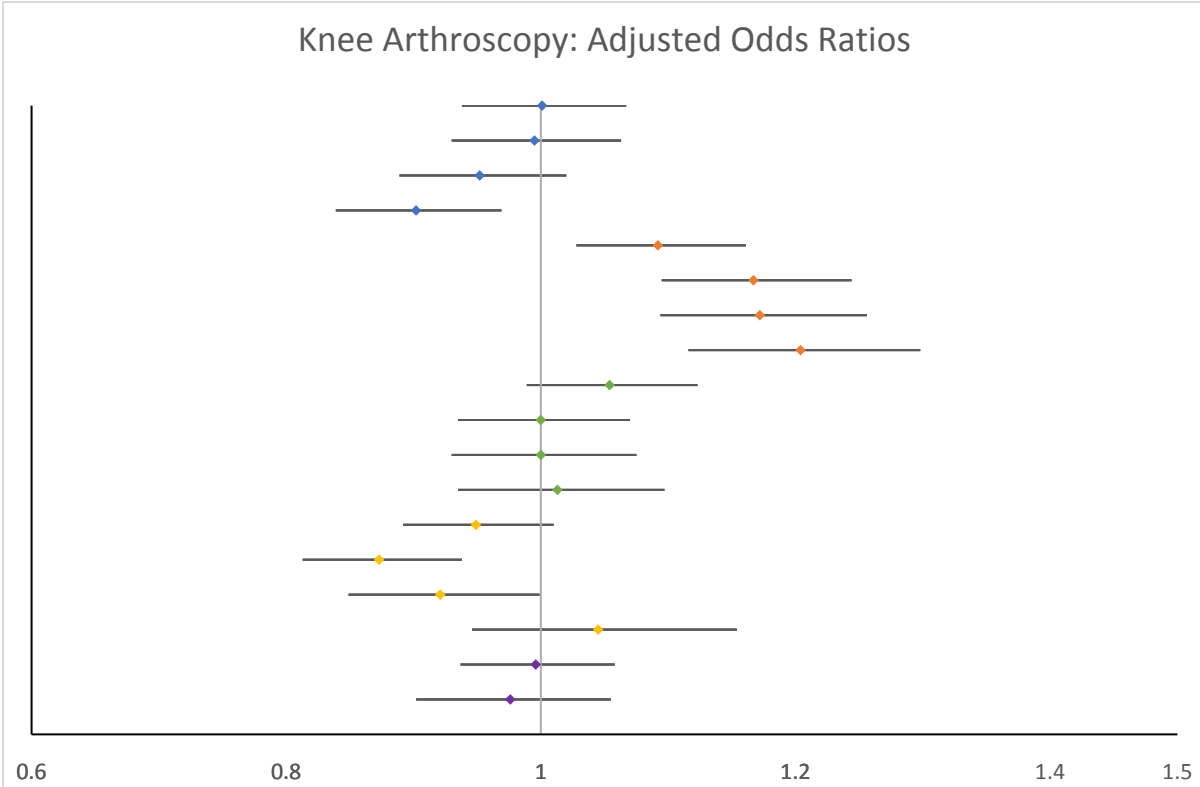


Figure 3: Forest plot for the association between risk of exceeding surgical wait time targets by marginalization subdomains for knee arthroscopy, hip and knee arthroplasty



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Figure 4: Forest plot for the association between risk of exceeding surgical wait time targets by marginalization subdomains for cholecystectomy and inguinal hernia repair.

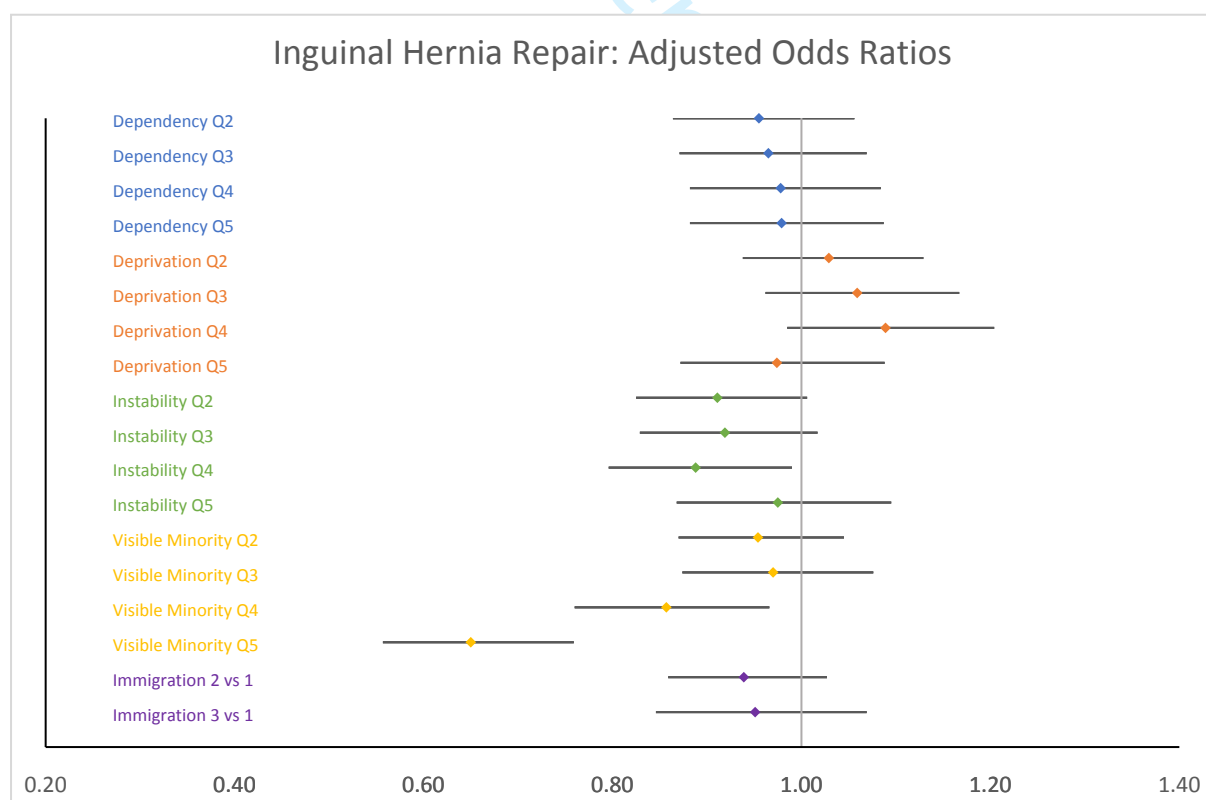
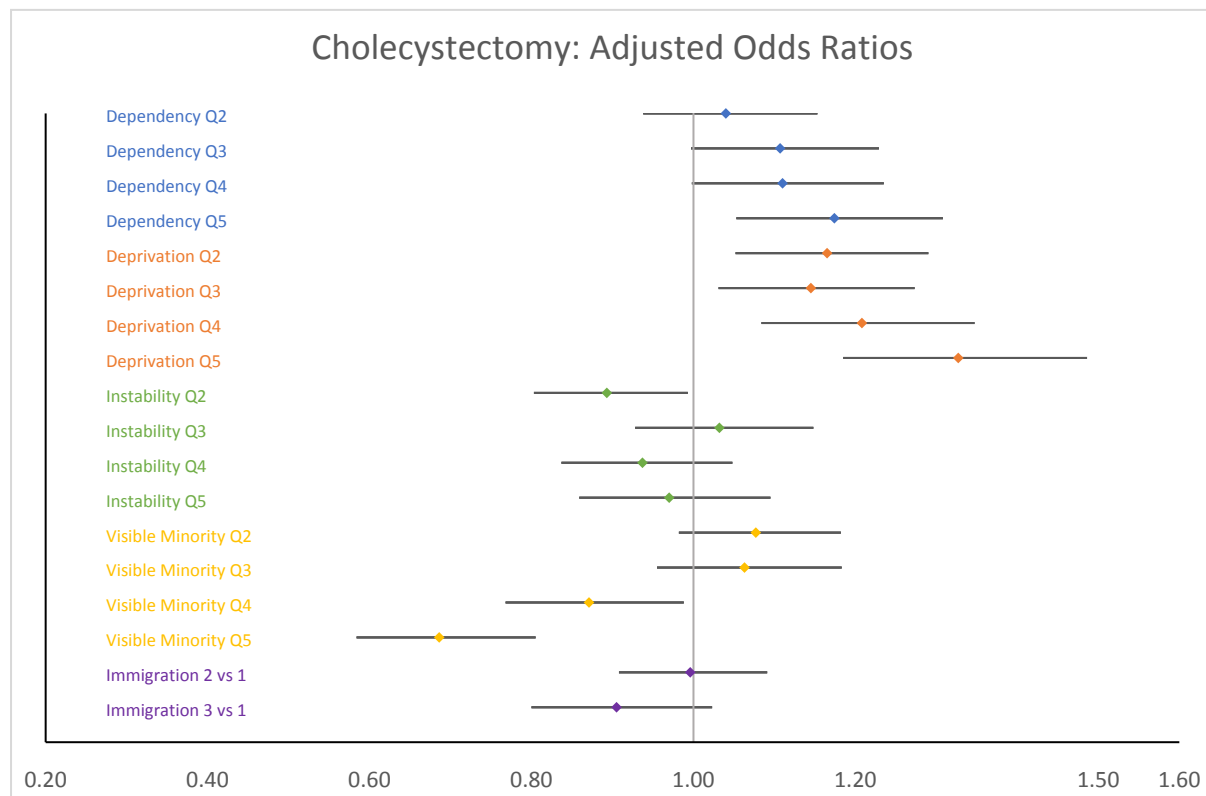


Table 1: Procedures exceeding wait time by patient characteristics and priority level

		Overall n (%)	Priority 3 n (%)	Priority 4 n (%)
		N=174,633 (12.60)	N=50,088 (3.61)	N=124,545 (8.99)
Age category	18-49	23,066 (7.5)	11,315 (14.3)	11,751 (5.1)
	50-59	23,965 (10.5)	8,631 (17.0)	15,334 (8.7)
	60-69	47,031 (13.9)	12,482 (22.1)	34,549 (12.3)
	70-79	55,377 (15.7)	12,226 (25.9)	43,151 (14.1)
	80+	25,194 (15.8)	5,434 (26.3)	19,760 (14.2)
Sex	Female	106,899 (12.8)	31,793 (20.5)	75,106 (11.0)
	Male	67,734 (12.4)	18,295 (18.5)	49,439 (11.0)
Rural residence	No	147,823 (12.2)	42,937 (19.7)	104,886 (10.6)
	Yes	26,810 (15.2)	7,151 (19.7)	19,659 (14.0)
Region	Eastern	33,789 (13.4)	9,243 (18.8)	24,546 (12.1)
	GTHA	54,205 (10.8)	18,903 (19.9)	35,302 (8.7)
	Toronto	19,286 (8.8)	5,793 (13.8)	13,493 (7.6)
	Western	51,979 (16.9)	11,522 (23.4)	40,457 (15.7)
	Northern	15,374 (14.7)	4,627 (24.6)	10,747 (12.5)
Comorbidity score category	0-4	32,161 (13.0)	8,954 (19.4)	23,207 (11.5)
	5-6	37,689 (12.8)	10,881 (19.8)	26,808 (11.2)
	7-8	38,198 (12.5)	11,201 (19.7)	26,997 (10.8)
	9-10	30,318 (12.4)	8,779 (19.6)	21,539 (10.8)
	11+	36,267 (12.4)	10,273 (20.0)	25,994 (10.8)
Teaching status	Non-teaching	123,093 (11.7)	39,358 (18.8)	83,735 (9.9)
	Teaching	51,540 (15.6)	10,730 (24.2)	40,810 (14.3)
Year	2013	16,397 (10.4)	6,766 (18.9)	9,631 (7.9)
	2014	19,830 (10.0)	7,101 (16.5)	12,729 (8.2)
	2015	22,244 (11.2)	6,833 (17.3)	15,411 (9.7)
	2016	27,213 (13.3)	7,857 (21.0)	19,356 (11.6)
	2017	30,118 (14.6)	7,428 (22.5)	22,690 (13.1)
	2018	29,852 (14.2)	7,212 (21.6)	22,640 (12.8)
	2019	28,979 (13.8)	6,891 (21.6)	22,088 (12.4)
Procedure	Cataract	81,537 (14.9)	11,106 (29.1)	70,431 (13.8)
	Knee arthroplasty	37,756 (23.9)	12,762 (40.1)	24,994 (19.8)
	Hip arthroplasty	18,607 (20.4)	6,722 (34.5)	11,885 (16.6)
	Arthroscopy (knee)	10,632 (7.2)	5,158 (14.9)	5,474 (4.9)
	Gallbladder	4,398 (3.6)	2,773 (6.2)	1,625 (2.1)
	Inguinal hernia	4,703 (4.8)	2,533 (8.2)	2,170 (3.2)
	Benign uterine	17,000 (7.6)	9,034 (16.5)	7,966 (4.7)

Notes: Wait Time Information System (WTIS) classifies procedure priority level. Level 1 is the most urgent, requiring immediate transfer to the operating room. This is followed by levels 2, 3 and 4, requiring urgent, semi-urgent and elective surgical intervention. The target wait time for Level 3 is 84 days or less, and for Level 4, 182 days or less. Benign uterine disease requiring surgical treatment consists of a mixture of hysterectomy (28%), hysteroscopic endometrial ablation (16%) and other benign diseases (56%). 'Other benign diseases' is primarily composed of resection of endometrial polyps, myomectomy, and adhesion lysis. GTHA = Greater Toronto and Hamilton Area. Comorbidity score category: Sum of Aggregated Diagnosis Groups (ADGs). Estimated using Aggregated Diagnosis Groups (ADGs) calculated with The Johns Hopkins

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ACG® System Version 10 software, based on subjects' health care utilization records in the Discharge Abstract Database, Same-Day Surgery Database, and Ontario Health Insurance Plan database. Teaching Status: Teaching hospitals are those classified as Group A under the Public Hospitals Act(29). Percentage (%) refers the percent of procedures exceeding wait time divided by the total number of procedures by patient characteristic and priority level

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Table 2: Procedures exceeding wait-time by patient deprivation and priority level

		Overall n (%)	Priority 3 n (%)	Priority 4 n (%)
		N=174,633 (12.60)	N=50,088 (3.61)	N=124,545 (8.99)
Dependency Quintile	1	29,015 (11.0)	9,347 (18.9)	19,668 (9.2)
	2	30,245 (12.1)	8,968 (19.6)	21,277 (10.4)
	3	31,884 (12.7)	8,915 (19.5)	22,969 (11.2)
	4	34,829 (13.0)	9,888 (20.0)	24,941 (11.4)
	5	48,660 (13.8)	12,970 (20.3)	35,690 (12.3)
Deprivation Quintile	1	37,833 (12.8)	10,852 (21.6)	26,981 (11.0)
	2	36,097 (12.5)	10,389 (20.0)	25,708 (10.8)
	3	35,255 (12.8)	10,302 (19.7)	24,953 (11.2)
	4	34,378 (12.8)	9,690 (18.8)	24,688 (11.3)
	5	31,070 (12.1)	8,855 (18.3)	22,215 (10.6)
Instability Quintile	1	30,565 (11.7)	9,613 (19.7)	20,952 (9.9)
	2	34,392 (12.6)	10,059 (19.8)	24,333 (10.9)
	3	35,351 (12.7)	9,897 (19.3)	25,454 (11.3)
	4	35,281 (13.1)	9,737 (19.4)	25,544 (11.6)
	5	39,044 (12.8)	10,782 (20.2)	28,262 (11.3)
Self-identify as a visible minority	1	41,034 (14.8)	11,091 (20.3)	29,943 (13.4)
	2	39,468 (13.6)	10,589 (19.7)	28,879 (12.2)
	3	35,779 (13.1)	9,947 (21.7)	25,832 (11.4)
	4	31,614 (11.9)	9,135 (20.6)	22,479 (10.1)
	5	26,738 (9.6)	9,326 (16.7)	17,412 (7.8)
Immigrated last five years	1	112,226 (13.4)	30,755 (20.1)	81,471 (11.9)
	2	31,301 (11.9)	9,294 (20.1)	22,007 (10.2)
	3	31,106 (10.8)	10,039 (18.2)	21,067 (9.1)
Notes: Wait Time Information System (WTIS) classifies procedure priority level. Level 1 is the most urgent, requiring immediate transfer to the operating room. This is followed by levels 2, 3 and 4, requiring urgent, semi-urgent and elective surgical intervention. The target wait time for Level 3 is 84 days or less, and for Level 4, 182 days or less. Percentage (%) refers the percent of procedures exceeding wait time divided by the total number of procedures by patient characteristic and priority level. Levels of marginalization was categorized by ranking all dissemination areas in Ontario within each domain (or sub-domain) and assigned to a quintile, with quintile 1 representing the dissemination area with the lowest marginalization and quintile 5 (or quintile 3 in the case of 'immigrated last five years') the highest.				

Table 3: Unadjusted and adjusted risk of prolonged surgical wait time for cataract and benign uterine surgery, according to marginalization measures and patient and hospital factors

Patient Characteristic		Cataract Surgery		Benign Uterine Surgery	
		OR (CI95%)	aOR ¹ (CI95%)	OR (CI95%)	aOR ¹ (CI95%)
Age category (ref: 40)	50	1.10 (1.06, 1.14)	1.10 (1.06, 1.14)	0.94 (0.92, 0.96)	0.90 (0.88, 0.92)
	60	1.33 (1.27, 1.40)	1.33 (1.27, 1.40)	0.75 (0.71, 0.78)	0.68 (0.65, 0.71)
	70	1.62 (1.54, 1.72)	1.63 (1.54, 1.73)	0.59 (0.56, 0.63)	0.51 (0.48, 0.54)
	80	1.83 (1.74, 1.93)	1.86 (1.76, 1.97)	0.56 (0.50, 0.62)	0.47 (0.42, 0.52)
Comorbidity score (per 5-unit increase)*		0.95 (0.94, 0.96)	0.95 (0.94, 0.96)	0.95 (0.92, 0.98)	1.01 (0.98, 1.05)
Priority level (ref: 3)	Priority 4	2.56 (2.50, 2.62)	2.78 (2.72, 2.85)	3.98 (3.86, 4.11)	4.76 (4.60, 4.93)
Sex (ref: male)	Female	1.13 (1.12, 1.15)	1.14 (1.13, 1.16)	-	-
Rural (ref: non-rural)		1.35 (1.32, 1.38)	1.32 (1.29, 1.35)	1.02 (0.97, 1.07)	0.85 (0.80, 0.91)
Region (ref: Toronto)	Eastern	1.56 (1.52, 1.60)	1.41 (1.36, 1.45)	1.67 (1.58, 1.76)	1.69 (1.58, 1.80)
	GTHA	1.10 (1.08, 1.13)	1.08 (1.05, 1.11)	1.13 (1.07, 1.19)	1.46 (1.38, 1.54)
	Western	1.69 (1.65, 1.74)	1.61 (1.57, 1.66)	1.27 (1.20, 1.34)	2.11 (1.97, 2.25)
	Northern	1.06 (1.02, 1.10)	1.04 (1.00, 1.08)	3.35 (3.16, 3.55)	4.59 (4.25, 4.96)
Hospital type (ref: non-teaching)	Teaching	1.07 (1.05, 1.09)	1.00 (0.98, 1.02)	1.91 (1.84, 1.97)	2.16 (2.09, 2.24)
Year (ref: 2013)	2014	1.08 (1.05, 1.12)	1.10 (1.06, 1.14)	0.91 (0.85, 0.97)	0.90 (0.84, 0.96)
	2015	1.48 (1.43, 1.53)	1.53 (1.48, 1.58)	0.93 (0.88, 0.99)	0.95 (0.89, 1.01)
	2016	2.09 (2.02, 2.16)	2.19 (2.12, 2.27)	0.95 (0.89, 1.01)	1.00 (0.94, 1.07)
	2017	2.40 (2.32, 2.47)	2.54 (2.46, 2.62)	0.96 (0.90, 1.02)	1.04 (0.98, 1.11)
	2018	2.32 (2.25, 2.40)	2.39 (2.32, 2.47)	0.88 (0.83, 0.93)	0.96 (0.90, 1.03)
	2019	2.19 (2.12, 2.26)	2.22 (2.15, 2.30)	0.84 (0.79, 0.89)	0.94 (0.88, 1.00)
Dependency quintile	2	0.96 (0.93, 0.98)	0.94 (0.91, 0.96)	0.97 (0.93, 1.02)	1.00 (0.95, 1.05)
	3	0.92 (0.90, 0.95)	0.89 (0.87, 0.91)	0.96 (0.92, 1.01)	0.99 (0.94, 1.05)
	4	0.90 (0.87, 0.92)	0.84 (0.81, 0.86)	0.93 (0.88, 0.97)	0.99 (0.93, 1.04)
	5	0.94 (0.92, 0.96)	0.81 (0.79, 0.84)	0.86 (0.81, 0.90)	0.96 (0.91, 1.02)
Deprivation quintile	2	0.90 (0.88, 0.93)	0.90 (0.88, 0.92)	0.98 (0.93, 1.03)	1.01 (0.96, 1.06)
	3	0.89 (0.87, 0.91)	0.86 (0.84, 0.89)	1.02 (0.98, 1.08)	1.08 (1.02, 1.13)
	4	0.86 (0.84, 0.88)	0.82 (0.80, 0.84)	1.07 (1.02, 1.13)	1.12 (1.06, 1.19)
	5	0.80 (0.78, 0.82)	0.74 (0.72, 0.76)	1.03 (0.98, 1.09)	1.05 (0.99, 1.11)
Instability quintile	2	1.00 (0.97, 1.02)	0.98 (0.96, 1.01)	0.96 (0.91, 1.01)	1.00 (0.95, 1.06)
	3	0.98 (0.96, 1.01)	1.00 (0.97, 1.02)	0.92 (0.87, 0.96)	0.97 (0.92, 1.02)
	4	1.06 (1.03, 1.08)	1.14 (1.11, 1.18)	0.91 (0.87, 0.96)	0.95 (0.89, 1.00)
	5	1.09 (1.07, 1.12)	1.23 (1.19, 1.27)	0.95 (0.90, 1.00)	0.92 (0.86, 0.98)
Visible minority quintile	2	0.94 (0.92, 0.96)	0.96 (0.94, 0.98)	0.99 (0.94, 1.04)	0.92 (0.87, 0.97)
	3	0.98 (0.96, 1.01)	1.03 (1.00, 1.06)	1.21 (1.15, 1.28)	1.10 (1.03, 1.17)

	4	0.98 (0.96, 1.00)	1.02 (0.99, 1.05)	1.22 (1.15, 1.29)	1.09 (1.02, 1.17)
	5	0.77 (0.75, 0.79)	0.83 (0.80, 0.86)	1.45 (1.37, 1.54)	1.26 (1.16, 1.36)
Recent immigration	2	0.99 (0.97, 1.01)	1.04 (1.01, 1.06)	1.11 (1.06, 1.15)	1.00 (0.95, 1.05)
	3	0.99 (0.97, 1.01)	1.11 (1.08, 1.15)	1.23 (1.17, 1.28)	1.08 (1.02, 1.15)

Notes: Wait Time Information System (WTIS) classifies procedure priority level. Level 1 is the most urgent, requiring immediate transfer to the operating room. This is followed by levels 2, 3 and 4, requiring urgent, semi-urgent and elective surgical intervention. The target wait time for Level 3 is 84 days or less, and for Level 4, 182 days or less. Benign uterine disease requiring surgical treatment consists of a mixture of hysterectomy (28%), hysteroscopic endometrial ablation (16%) and other benign diseases (56%). 'Other benign diseases' is primarily composed of resection of endometrial polyps, myomectomy, and adhesion lysis. GTHA = Greater Toronto and Hamilton Area. Comorbidity score category: Sum of Aggregated Diagnosis Groups (ADGs). Estimated using Aggregated Diagnosis Groups (ADGs) calculated with The Johns Hopkins ACG® System Version 10 software, based on subjects' health care utilization records in the Discharge Abstract Database, Same-Day Surgery Database, and Ontario Health Insurance Plan database. Teaching Status: Teaching hospitals are those classified as Group A under the Public Hospitals Act(29). Percentage (%) refers the percent of procedures exceeding wait time divided by the total number of procedures by patient characteristic and priority level

Table 4: Unadjusted and adjusted factors associated with prolonged surgical wait time for knee and hip arthroplasty

Patient Characteristic		Knee Arthroplasty		Hip Arthroplasty	
		OR (CI95%)	aOR ¹ (CI95%)	OR (CI95%)	aOR ¹ (CI95%)
Age (ref: 40)	50	1.16 (1.11, 1.21)	1.19 (1.13, 1.24)	0.86 (0.82, 0.91)	0.89 (0.84, 0.94)
	60	1.23 (1.15, 1.33)	1.29 (1.20, 1.40)	0.74 (0.68, 0.80)	0.78 (0.72, 0.85)
	70	1.21 (1.11, 1.31)	1.30 (1.19, 1.42)	0.69 (0.64, 0.75)	0.75 (0.69, 0.82)
	80	1.09 (1.01, 1.18)	1.20 (1.11, 1.30)	0.66 (0.61, 0.71)	0.72 (0.66, 0.77)
Comorbidity score (per 5-unit increase)		0.89 (0.87, 0.90)	0.92 (0.91, 0.94)	0.85 (0.83, 0.87)	0.90 (0.87, 0.92)
Priority level (ref: 4)	Priority 3	2.71 (2.64, 2.79)	3.30 (3.21, 3.40)	2.65 (2.56, 2.75)	3.10 (2.99, 3.22)
Sex (ref: male)	Female	1.05 (1.03, 1.08)	1.08 (1.06, 1.11)	0.95 (0.92, 0.98)	0.99 (0.95, 1.02)
Rural (ref: non-rural)		1.13 (1.09, 1.16)	0.88 (0.84, 0.91)	1.23 (1.18, 1.29)	0.95 (0.90, 1.00)
Region (ref: Toronto)	Eastern	1.47 (1.40, 1.55)	1.89 (1.78, 2.01)	1.68 (1.57, 1.80)	1.82 (1.69, 1.97)
	GTHA	2.11 (2.01, 2.21)	2.51 (2.39, 2.64)	1.84 (1.72, 1.96)	2.06 (1.92, 2.21)
	Western	4.94 (4.72, 5.18)	6.87 (6.51, 7.25)	4.21 (3.95, 4.48)	4.79 (4.45, 5.15)
	Northern	2.43 (2.30, 2.58)	2.72 (2.54, 2.90)	2.08 (1.92, 2.25)	1.76 (1.61, 1.93)
Hospital type (ref: non-teaching)	Teaching	1.12 (1.09, 1.15)	1.46 (1.42, 1.50)	1.37 (1.32, 1.41)	1.72 (1.66, 1.79)
Year (ref: 2013)	2014	0.88 (0.84, 0.93)	0.90 (0.85, 0.94)	0.87 (0.81, 0.93)	0.89 (0.83, 0.96)
	2015	0.86 (0.82, 0.90)	0.94 (0.89, 0.99)	0.93 (0.87, 1.00)	1.02 (0.95, 1.10)
	2016	1.07 (1.02, 1.12)	1.22 (1.16, 1.28)	1.03 (0.96, 1.10)	1.17 (1.09, 1.26)
	2017	1.19 (1.14, 1.25)	1.44 (1.37, 1.51)	1.10 (1.03, 1.18)	1.36 (1.27, 1.46)
	2018	1.15 (1.10, 1.21)	1.39 (1.32, 1.46)	1.00 (0.93, 1.06)	1.23 (1.15, 1.32)
	2019	1.06 (1.01, 1.11)	1.28 (1.22, 1.35)	1.00 (0.94, 1.07)	1.24 (1.16, 1.33)
Dependency quintile	2	0.98 (0.94, 1.02)	1.01 (0.97, 1.05)	1.07 (1.01, 1.13)	1.06 (0.99, 1.12)
	3	0.98 (0.94, 1.02)	1.03 (0.98, 1.07)	1.01 (0.95, 1.07)	1.00 (0.94, 1.07)
	4	0.96 (0.93, 1.00)	1.02 (0.98, 1.07)	1.01 (0.96, 1.08)	1.02 (0.96, 1.08)
	5	0.92 (0.89, 0.96)	1.01 (0.96, 1.05)	0.96 (0.91, 1.02)	0.97 (0.91, 1.04)
Deprivation quintile	2	1.01 (0.98, 1.05)	1.03 (0.99, 1.07)	1.01 (0.97, 1.07)	1.05 (0.99, 1.10)
	3	1.15 (1.10, 1.19)	1.15 (1.11, 1.20)	1.07 (1.02, 1.13)	1.10 (1.05, 1.16)
	4	1.19 (1.15, 1.24)	1.22 (1.17, 1.27)	1.12 (1.06, 1.18)	1.19 (1.12, 1.26)
	5	1.18 (1.13, 1.22)	1.22 (1.16, 1.27)	1.13 (1.07, 1.19)	1.21 (1.14, 1.29)
Instability quintile	2	0.96 (0.92, 1.00)	1.01 (0.97, 1.05)	1.07 (1.01, 1.13)	1.09 (1.03, 1.15)
	3	0.97 (0.93, 1.01)	0.99 (0.95, 1.04)	1.05 (1.00, 1.11)	1.05 (0.99, 1.12)
	4	0.97 (0.94, 1.01)	0.95 (0.91, 1.00)	1.06 (1.00, 1.12)	1.04 (0.97, 1.10)
	5	1.04 (1.00, 1.08)	0.95 (0.90, 0.99)	1.11 (1.05, 1.17)	1.05 (0.98, 1.12)
Visible minority	2	0.98 (0.95, 1.02)	0.97 (0.94, 1.01)	0.95 (0.91, 1.00)	0.94 (0.90, 0.99)

quintile	3	1.00 (0.96, 1.04)	0.94 (0.90, 0.98)	0.97 (0.93, 1.02)	0.93 (0.88, 0.98)
	4	1.08 (1.03, 1.12)	0.94 (0.90, 0.99)	0.95 (0.90, 1.01)	0.86 (0.81, 0.92)
	5	1.32 (1.26, 1.38)	1.05 (0.99, 1.12)	0.91 (0.84, 0.97)	0.81 (0.74, 0.88)
Recent immigration	2	1.06 (1.02, 1.09)	1.01 (0.98, 1.05)	1.01 (0.96, 1.05)	1.00 (0.95, 1.05)
	3	1.29 (1.25, 1.34)	1.11 (1.05, 1.16)	1.01 (0.96, 1.07)	1.01 (0.94, 1.08)

Notes: Adjusted odds ratios were calculated by adjusting for all the variables in the table. Unless otherwise stated, the reference group for presented odds ratios is quintile 1. aOR, adjusted odds ratio; OR, odds ratio; CI95%, 95% confidence interval. GTHA = Greater Toronto and Hamilton Area. Wait Time Information System (WTIS) classifies procedure priority level. Level 1 is the most urgent, requiring immediate transfer to the operating room. This is followed by levels 2, 3 and 4, requiring urgent, semi-urgent and elective surgical intervention. The target wait time for Level 3 is 84 days or less, and for Level 4, 182 days or less. Benign uterine disease requiring surgical treatment consists of a mixture of hysterectomy (28%), hysteroscopic endometrial ablation (16%) and other benign diseases (56%). 'Other benign diseases' is primarily composed of resection of endometrial polyps, myomectomy, and adhesion lysis. GTHA = Greater Toronto and Hamilton Area. Comorbidity score category: Sum of Aggregated Diagnosis Groups (ADGs). Estimated using Aggregated Diagnosis Groups (ADGs) calculated with The Johns Hopkins ACG® System Version 10 software, based on subjects' health care utilization records in the Discharge Abstract Database, Same-Day Surgery Database, and Ontario Health Insurance Plan database. Teaching Status: Teaching hospitals are those classified as Group A under the Public Hospitals Act(29). Levels of marginalization was categorized by ranking all dissemination areas in Ontario within each domain (or sub-domain) and assigned to a quintile, with quintile 1 representing the dissemination area with the lowest marginalization and quintile 5 (or quintile 3 in the case of 'immigrated last five years') the highest.

Table 5: Unadjusted and adjusted factors associated with prolonged surgical wait time for cholecystectomy and inguinal hernia repair

Patient Characteristic		Cholecystectomy		Inguinal hernia repair	
		OR (CI95%)	aOR ¹ (CI95%)	OR (CI95%)	aOR ¹ (CI95%)
Age (ref: 40)	50	1.07 (1.02, 1.12)	1.06 (1.01, 1.11)	1.06 (1.03, 1.09)	1.06 (1.03, 1.10)
	60	1.07 (1.00, 1.15)	1.04 (0.97, 1.12)	1.05 (1.00, 1.10)	1.04 (0.99, 1.10)
	70	1.00 (0.92, 1.09)	0.95 (0.87, 1.04)	0.97 (0.91, 1.03)	0.94 (0.88, 1.01)
	80	0.85 (0.76, 0.95)	0.79 (0.70, 0.89)	0.84 (0.77, 0.91)	0.78 (0.71, 0.86)
Comorbidity score (per 5-unit increase)*		0.95 (0.90, 0.99)	0.96 (0.92, 1.01)	0.97 (0.93, 1.01)	1.01 (0.97, 1.06)
Priority level (ref: 4)	Priority 3	3.05 (2.86, 3.24)	3.89 (3.64, 4.15)	2.67 (2.51, 2.83)	3.47 (3.26, 3.70)
Sex (ref: male)	Female	1.06 (0.99, 1.13)	1.08 (1.01, 1.16)	1.11 (1.01, 1.22)	1.12 (1.01, 1.24)
Rural (ref: non-rural)		1.10 (1.01, 1.21)	0.77 (0.69, 0.85)	1.05 (0.96, 1.15)	0.85 (0.77, 0.94)
Region (ref: Toronto)	Eastern	1.45 (1.28, 1.64)	0.99 (0.86, 1.14)	1.30 (1.16, 1.46)	0.97 (0.85, 1.10)
	GTHA	1.13 (1.01, 1.26)	1.02 (0.91, 1.15)	1.32 (1.19, 1.47)	1.09 (0.97, 1.22)
	Western	1.84 (1.65, 2.06)	1.47 (1.29, 1.67)	1.73 (1.55, 1.92)	1.39 (1.23, 1.58)
	Northern	3.43 (3.03, 3.88)	2.32 (1.99, 2.71)	3.23 (2.86, 3.65)	2.01 (1.73, 2.34)
Hospital type (ref: non-teaching)	Teaching	2.60 (2.43, 2.77)	2.99 (2.78, 3.21)	2.83 (2.66, 3.02)	3.49 (3.25, 3.75)
Year (ref: 2013)	2014	0.88 (0.79, 0.99)	0.92 (0.82, 1.03)	0.82 (0.73, 0.91)	0.84 (0.75, 0.94)
	2015	0.87 (0.78, 0.97)	0.93 (0.83, 1.05)	0.87 (0.78, 0.97)	0.91 (0.81, 1.02)
	2016	0.72 (0.64, 0.81)	0.77 (0.69, 0.87)	0.75 (0.67, 0.84)	0.81 (0.72, 0.91)
	2017	0.77 (0.68, 0.86)	0.85 (0.75, 0.95)	0.75 (0.67, 0.84)	0.82 (0.73, 0.92)
	2018	0.69 (0.61, 0.78)	0.79 (0.70, 0.89)	0.70 (0.63, 0.79)	0.80 (0.72, 0.90)
	2019	0.80 (0.71, 0.90)	0.94 (0.84, 1.06)	0.75 (0.67, 0.84)	0.89 (0.80, 1.00)
Dependency quintile	2	1.18 (1.06, 1.30)	1.04 (0.94, 1.15)	1.04 (0.94, 1.14)	0.96 (0.86, 1.06)
	3	1.28 (1.16, 1.42)	1.11 (1.00, 1.23)	1.06 (0.96, 1.16)	0.97 (0.87, 1.07)
	4	1.26 (1.14, 1.40)	1.11 (1.00, 1.24)	1.03 (0.94, 1.14)	0.98 (0.88, 1.08)
	5	1.33 (1.20, 1.46)	1.17 (1.05, 1.31)	1.01 (0.92, 1.11)	0.98 (0.88, 1.09)
Deprivation quintile	2	1.12 (1.01, 1.23)	1.16 (1.05, 1.29)	0.97 (0.89, 1.06)	1.03 (0.94, 1.13)
	3	1.08 (0.98, 1.20)	1.15 (1.03, 1.27)	0.98 (0.90, 1.08)	1.06 (0.96, 1.17)
	4	1.17 (1.06, 1.29)	1.21 (1.08, 1.35)	1.04 (0.95, 1.14)	1.09 (0.99, 1.20)
	5	1.26 (1.15, 1.39)	1.33 (1.19, 1.49)	0.95 (0.86, 1.05)	0.97 (0.87, 1.09)
Instability quintile	2	1.02 (0.92, 1.13)	0.89 (0.80, 0.99)	0.99 (0.90, 1.09)	0.91 (0.82, 1.01)
	3	1.24 (1.12, 1.36)	1.03 (0.93, 1.15)	1.03 (0.93, 1.13)	0.92 (0.83, 1.02)
	4	1.18 (1.07, 1.31)	0.94 (0.84, 1.05)	0.99 (0.90, 1.09)	0.89 (0.80, 0.99)
	5	1.29 (1.17, 1.42)	0.97 (0.86, 1.10)	1.12 (1.02, 1.24)	0.97 (0.87, 1.09)
Visible minority quintile	2	1.16 (1.06, 1.27)	1.08 (0.98, 1.18)	1.01 (0.93, 1.10)	0.95 (0.87, 1.05)
	3	1.22 (1.11, 1.34)	1.06 (0.96, 1.18)	1.10 (1.00, 1.20)	0.97 (0.87, 1.08)

	4	0.94 (0.84, 1.04)	0.87 (0.77, 0.99)	1.00 (0.90, 1.10)	0.86 (0.76, 0.97)
	5	0.68 (0.60, 0.77)	0.69 (0.58, 0.81)	0.68 (0.61, 0.77)	0.65 (0.56, 0.76)
Recent immigration	2	0.93 (0.86, 1.01)	1.00 (0.91, 1.09)	0.92 (0.85, 1.00)	0.94 (0.86, 1.03)
	3	0.73 (0.67, 0.80)	0.90 (0.80, 1.02)	0.80 (0.73, 0.88)	0.95 (0.85, 1.07)

Notes: Adjusted odds ratios were calculated by adjusting for all the variables in the table. Unless otherwise stated, the reference group for presented odds ratios is quintile 1. aOR, adjusted odds ratio; OR, odds ratio; CI95%, 95% confidence interval. GTHA = Greater Toronto and Hamilton Area. Wait Time Information System (WTIS) classifies procedure priority level. Level 1 is the most urgent, requiring immediate transfer to the operating room. This is followed by levels 2, 3 and 4, requiring urgent, semi-urgent and elective surgical intervention. The target wait time for Level 3 is 84 days or less, and for Level 4, 182 days or less. Benign uterine disease requiring surgical treatment consists of a mixture of hysterectomy (28%), hysteroscopic endometrial ablation (16%) and other benign diseases (56%). 'Other benign diseases' is primarily composed of resection of endometrial polyps, myomectomy, and adhesion lysis. GTHA = Greater Toronto and Hamilton Area. Comorbidity score category: Sum of Aggregated Diagnosis Groups (ADGs). Estimated using Aggregated Diagnosis Groups (ADGs) calculated with The Johns Hopkins ACG® System Version 10 software, based on subjects' health care utilization records in the Discharge Abstract Database, Same-Day Surgery Database, and Ontario Health Insurance Plan database. Teaching Status: Teaching hospitals are those classified as Group A under the Public Hospitals Act(29). Levels of marginalization was categorized by ranking all dissemination areas in Ontario within each domain (or sub-domain) and assigned to a quintile, with quintile 1 representing the dissemination area with the lowest marginalization and quintile 5 (or quintile 3 in the case of 'immigrated last five years') the highest.