Supplementary Material

Supplementary Material 1. Using unique encrypted ICES keys, cohort data were assembled by linking 15 separate data sources housed at ICES, representing various aspects of the publicly funding healthcare system in Ontario.

Data source	Full name	Description
RPDB	Registered Persons Database	Patient characteristics and vital status
OCR	Ontario Cancer Registry	Cohort identification, tumour characteristics
NACRS	National Ambulatory Care Reporting System	Emergency and ambulatory visits
OCCC	Ontario Crohns and Colitis Cohort	Identification of inflammatory bowel disease patients
NDFP	New Drug Funding Program	Chemotherapy administration
CAPE	Client Agency Program Enrollment	Primary care physician identification
OHIP	Ontario Health Insurance Plan	Delivery of care and physician interaction
CIHI-DAD	Canadian Institute for Health Information Discharge Abstract Database	Delivery of care and physician interaction
CIHI-SDS	Canadian Institute for Health Information Same Day Surgery Database	Delivery of care and physician interaction
ORGD	Office of the Registrar General Database	Cause of death
IPDB	ICES Physician Database	Physician characteristics
ALR	Cancer Activity Level Reporting	Cancer treatment
Census	Ontario Census	Socioeconomic status
LHIN	Local Health Integration Network	Geographic data
INST	Institute Information System	Hospital and health care institution information

Supplementary Material 2. STROBE Checklist for cohort studies.

Item	Item No	Recommendation	Page or Location
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3-4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3-4
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	4
		(b)For matched studies, give matching criteria and number of exposed and unexposed	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4-5
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4-5
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	4-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6
		(b) Describe any methods used to examine subgroups and interactions	6
		(c) Explain how missing data were addressed	6
		(d) If applicable, explain how loss to follow-up was addressed	6
		(e) Describe any sensitivity analyses	6
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	6, Figure 2
		(c) Consider use of a flow diagram	6, Figure 2
Descriptive data	14	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	6, Figure 2, Table 1
		(c) Summarise follow-up time (eg, average and total amount)	6-7
Outcome data	15	Report numbers of outcome events or summary measures over time	6-7
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6-7
		(b) Report category boundaries when continuous variables were categorized	6-7
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	6-7
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
Discussion			
Key results	18	Summarise key results with reference to study objectives	8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	8-9

Item	Item No	Recommendation	Page or Location
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	8-9
Generalisability	21	Discuss the generalisability (external validity) of the study results	8-9
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

Supplementary Material 3. Identification of colorectal cancer and inflammatory bowel disease.

Criteria	Definition
Colorectal cancer	International Classification of Diseases version 10 [ICD-10] C18^ - C20^, excluding C18.1 (Appendix)
Inflammatory bowel disease	Ever included in the Ontario Crohn's and Colitis Cohort or the occurrence of ICD-9-CM 555, 555.0-555.9, 556, 556.0-556.9 or ICD-10-CM K500, K501, K508-K515 during an emergency room visit/hospitalization within 5 years prior to the CRC diagnosis date

Supplementary Material 4. Algorithms for determining date of first presentation for colorectal cancer-related signs and symptoms, date of first investigation, and date of first treatment.

Codes for determining date of first presentation for colorectal cancer-related signs and symptoms.

Category	Category name	Lookback weeks	Code type	Included codes
1	Colorectal cancer	47	ICD-10	C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C19, C20, C210, C211, C212, C218
			OHIP diagnostic	153, 154
2	Other cancer	25	ICD-10	C170, C171, C172, C173, C178, C179, C220, C221, C222, C223, C224, C227, C229, C260, C261, C268, C269, C780, C7800, C7801, C7809, C781, C782, C783, C784, C785, C786, C787, C788, C790, C791, C792, C793, C794, C795, C796, C797, C7980, C7988, C799, C80, C800, C809
			OHIP diagnostic	152, 155, 159, 197, 198, 199
3	Benign neoplasm/in situ	30	ICD-10	D0000, D0001, D0002, D0003, D0004, D0005, D0006, D0007, D0008, D0009, D001, D002, D010, D011, D012, D013, D014, D015, D017, D019, D130, D131, D132, D133, D134, D135, D136, D137, D139, D3701, D3702, D37030, D37031, D37032, D37039, D3704, D3705, D3708, D371, D372, D373, D374, D375, D376, D377, D379, D380, D381, D382, D383, D384, D385, D386, D483, D484
			OHIP diagnostic	211, 229, 230, 235
4	Upper GI symptoms	51	ICD-10	J860, K20, K210, K219, K220, K221, K2210, K2211, K2212, K2213, K2214, K2215, K2216, K2217, K2219, K222, K223, K224, K225, K226, K227, K228, K229, K250, K251, K252, K253, K254, K255, K256, K257, K259, K260, K261, K262, K263, K264, K265, K266, K267, K269, K290, K291, K292, K293, K294, K295, K296, K297, K298, K299, K310, K311, K312, K313, K314, K315, K316, K317, K318, K3180, K3181, K3188, K319, K522, K528, K529, K8000, K8001, K8010, K8011, K8020, K8021, K8030, K8031, K8040, K8041, K8050, K8051, K8080, K8081, K920, K921, K9146, K9160, K9161, K9162, K9169, R066, R100, R1010, R1011, R1012, R1019, R102, R1030, R1031, R1032, R1039, R104, R110, R111, R112, R113, R118, R12, R130, R132, R138, R17, R18, R190, R191, R192, R198, R630
			OHIP diagnostic	530, 531, 532, 535, 536, 537, 574, 787
5	Lower GI symptoms	66	ICD-10	A09, A090, A099, K350, K351, K352, K353, K358, K359, K500, K501, K508, K509, K510, K511, K512, K513, K514, K515, K518, K519, K552, K5520, K5521, K560, K561, K562, K563, K564, K565, K566, K567, K570, K571, K572, K573, K574, K575, K578, K579, K580, K589, K590, K591, K592, K593, K594, K598, K599, K600, K601, K602, K603, K604, K605, K620, K621, K622, K623, K624, K625, K626, K627, K628, K629, K630, K631, K632, K633, K634, K635, K638, K6388, K639, K640, K6410, K6411, K6420, K6421, K6430, K6431, K644, K645, K648, K649, K650, K658, K659, K670, K671, K672, K673, K678, K910, K911, K912, K913, K9140, K9141, K9142, K9143, K9144, K9145, K9149, K915, K918, K919, R14, R15, R194, R195, R1950, R1958
			OHIP diagnostic	009, 455, 540, 555, 556, 560, 562, 564, 565, 567, 569
6	Anemia	38	ICD-10	D500, D501, D508, D509, D510, D511, D512, D513, D518, D519, D520, D521, D528, D529, D530, D531, D532, D538, D539, D560, D561, D562, D563, D564
			OHIP diagnostic	280, 281, 284, 285
7	Colonoscopy	46	CCI	2NM70BABJ, 2NM70BNBJ
			OHIP billing	Z491, Z492, Z493, Z494, Z495, Z496, Z497, Z498, Z499, Z555
			OHIP diagnostic	545, 546, 547, 548
8	Other lower GI endoscopy	38	CCI	2NM70BABG, 2NM70BABH, 2NM70BA, 2NM70BNBG, 2NM70BNBH, 2NM70BN, 2NM70DA, 2NM70LA, 2NQ70BA, 2NQ70BN, 2NQ70CA, 2NQ70DA, 2NQ70LA
			OHIP billing	Z535, Z536, Z543, Z580
9	Polypectomy	33	CCI	1NM87DA, 1NM87BA, 1NQ87BA, 1NQ87BAFA, 1NQ87DA
			OHIP billing	E685, Z570, Z571
10	FOBT	22	CCI	4CU3166
			OHIP billing	G004, L179, L181
11	Colorectal resection	27	CCI	1NM87DE, 1NM87DF, 1NM87DN, 1NM87DX, 1NM87DY, 1NM87LA, 1NM87PN, 1NM87RD, 1NM87RE, 1NM87RN, 1NM87TF, 1NM87TG, 1NM89DF, 1NM89RN, 1NM89DX, 1NM89TF, 1NM89GB, 1NM89WJ, 1NM91DF, 1NM91RN, 1NM91DE, 1NM91RD, 1NM91DN, 1NM91RE, 1NM91DX, 1NM91TF, 1NM91DY, 1NM91TG, 1NQ87CA, 1NQ87DE, 1NQ87DF, 1NQ87DX, 1NQ87LA, 1NQ87PB, 1NQ87PF, 1NQ87PN, 1NQ87RD, 1NQ87TF, 1NQ89SF, 1NQ89KZ, 1NQ89GV, 1NQ89SFXXG, 1NQ89KZXXG, 1NQ89RS, 1NQ89LH, 1NQ89AB, 1NQ89RSXXG, 1NQ89LHXXG, 1NM59BAAG, 1NM59BAAW, 1NM59BAGX, 1NM59BAHB, 1NQ59DAAD, 1NQ59BAAD, 1NQ59LAAD, 1NQ59DAGX, 1NQ59BAGX, 1NQ59LAGX, 1NQ59DAAG, 1NQ59BAAG, 1NQ59LAAG, 1NQ59BAX7, 1NQ59HAX7, 1NQ59BAAW
			OHIP billing	E718, S149, S157, S165, S166, S167, S168, S169, S171, S175, S177, S180, S184, S213, S214, S217, S312, S314
12	Upper GI endoscopy	47	CCI	2NA70BA, 2NA70BN, 2NF70BA, 2NF70BN, 2NK70BABJ, 2NK70BA, 2NK70BABL, 2NK70BCBK, 2NK70BDBK, 2NK70BNBJ, 2NK70BNBL, 2NK70DA, 2NK70LA, 2NC70BA
			OHIP billing	Z399, Z400, Z527
13	General Surgery	49	OHIP billing	A033, A034, A035, A036, C003, C034, C035, C935
14	Gastroenterology	47	OHIP billing	A413, A414, A415, A418, C415
15	Abdominal ultrasound	24	CCI	3OT30DA, 3OT30DB, 3OT30DC, 3OT30DD, 3OT30DG, 3OT30HA, 3OT30LA
			OHIP billing	J128, J135, J428, J435
16	Abdominal X-ray	55	CCI	3NQ10VN, 3NZ10VN, 3NM10VN, 3NK10VV, 3NK10VN, 3NK10WG, 3NK10WX, 3NA10VN, 3NA10WG, 3NL10VN, 3OT10VA, 3OT10VH, 3OT10VZ, 3OT10WG, 3OT10WX, 3OT12VA
			OHIP billing	X100, X101, X103, X104, X112, X113, X197
17	Abdominal pelvic CT	50	CCI	3NM20VA, 3NM20WC, 3NM20WA, 3NM20WE, 3OT20VA, 3OT20WC, 3OT20WA, 3OT20WE
			OHIP billing	X231, X232, X233, X234, X409, X410
18	Other CT	19	CCI	3ER20VA, 3ER20WC, 3ER20WA, 3ER20WE, 3GY20VA, 3GY20WC, 3GY20WA, 3GY20WE, 3SC20VA, 3SC20WC, 3SC20WA, 3SC20WE
			OHIP billing	X400, X402, X406, X407, X415

Category	Category name	Lookback weeks	Code type	Included codes
19	Abdominal pelvic MRI	27	CCI	3OT40VA, 3OT40WC, 3OT40WA, 3OT40WE
			OHIP billing	X451, X455, X461, X465
20	Expanded		CCI	2NM71BABJ, 2NM71BA, 2NQ71BA, 2NF71BA, 1NP35BAX4, 2NK71BABL, 1NM35BAX4, 2NK71BA, 2NA71BA, 2NM71BABH, 1NF52CAQN, 2NK71BABJ, 1NK77RR, 1NM77RS, 1OT52HATS, 1NP13BAGX, 1OT52HA, 1OT52LA, 1NF53CATS, 2OT71LA, 1OT87LA, 1NF87BA, 2OT70LA, 1MG87LA, 1NK87RF, 2OA71LA, 1OT52LATS, 2OT70DA, 1NM77EP, 2NT70BA, 1NK77EN, 1NK87RE, 1NM50BANR, 1NK80LA, 2OT71DA, 2NM71BABG, 2OT71HA, 1NM80LA, 1NK87LA, 1NP13BAKK, 2NT71BA, 1NK87BA, 1NT87LA, 3KE20WC, 2MG71LA, 2NT70JA, 1MG87DA, 1NF53BTTS, 1NM52CATS, 2NM71BR, 1OT52DA, 1OA87LA, 1NF55CATS, 1NQ27JA, 1NQ13BAGX, 1NF52CATL, 1NM52LA, 2NQ71CA, 1NK52LA, 1NP13BAC2, 1NT87URFA, 2NM71DA, 1OT52DATS, 1NQ52LA, 1NK87TF, 2OA71DA, 2NM71LA, 3KT20WC, 2NF71BR, 1NF13BAKK, 1NM76RE, 2NM71BRBJ, 1NK87DN, 2NA71BR, 1NF13BAGX, 1NM50BABD, 1NK52UW
			ICD-10	D649, K922, Z121, D123, D125, D126, 81403, D630, C772, D128, D122, Z800, Y832, D120, Y836, Z8601, D124, R933, R634, Z512, Y838, Y833, 81406, Z8718, I842, Z031, D127, Z850, 80103, I849, Z8711, 80003, 80106, K30, Z860, 84803, Z837, 82611, C775, 82633, R935, I845, I841, I848, C97, Z8580, 80006, T8183, 82613, K613, 80001, Z858, K611, C779, Z092, Z980, 82103, Z933, N823, 84806, C762, 81400, D129, Z932, C771, 82463, 82100, R591, Z511, D487, 84903, C778, I844, Z808
			OHIP billing	L329, E740, E741, E747, E717, A135, E705, J162, E720, L720, L864, E702, J163, J138, C032, J462, A935, J201, L630, Q133, Q142, A120, X126, J438, E719, J463, E797, G322, C412, E746, Q005, C038, C418, A348, Z594, Z591, Z560, Z584, A416, Z765, Z552, Z785, E795, X107
			OHIP diagnostic	566, 151, 150, 534, 557, 158

GI - Gastrointestinal, ICD-10 - International Classification of Diseases version 10, OHIP - Ontario Health Insurance Plan, CCI - Canadian Classification of Health Interventions, FOBT - Faecal occult blood test, CT - Computed tomography, MRI - Magnetic resonance imaging

Codes for determining date of first investigation after the date of first presentation was determined.

Category	Category name	Code type	Included codes
7	Colonoscopy	CCI	2NM70BABJ, 2NM70BNBJ
		OHIP billing	Z491, Z492, Z493, Z494, Z495, Z496, Z497, Z498, Z499, Z555
		OHIP diagnostic	545, 546, 547, 548
8	Other lower GI endoscopy	CCI	2NM70BABG, 2NM70BABH, 2NM70BA, 2NM70BNBG, 2NM70BNBH, 2NM70BN, 2NM70DA, 2NM70LA, 2NQ70BA, 2NQ70BN, 2NQ70CA, 2NQ70DA, 2NQ70LA
		OHIP billing	Z535, Z536, Z543, Z580
10	FOBT	CCI	4CU3166
		OHIP billing	G004, L179, L181
15	Abdominal ultrasound	CCI	3OT30DA, 3OT30DB, 3OT30DC, 3OT30DD, 3OT30DG, 3OT30HA, 3OT30LA
		OHIP billing	J128, J135, J428, J435
16	Abdominal X-ray	CCI	3NQ10VN, 3NZ10VN, 3NM10VN, 3NK10VV, 3NK10VN, 3NK10WG, 3NK10WX, 3NA10VN, 3NA10WG, 3NL10VN, 3OT10VA, 3OT10VH, 3OT10VZ, 3OT10WG, 3OT10WX, 3OT12VA
		OHIP billing	X100, X101, X103, X104, X112, X113, X197
17	Abdominal pelvic CT	CCI	3NM20VA, 3NM20WC, 3NM20WA, 3NM20WE, 3OT20VA, 3OT20WC, 3OT20WA, 3OT20WE
		OHIP billing	X231, X232, X233, X234, X409, X410
18	Other CT	CCI	3ER20VA, 3ER20WC, 3ER20WA, 3ER20WE, 3GY20VA, 3GY20WC, 3GY20WA, 3GY20WE, 3SC20VA, 3SC20WC, 3SC20WA, 3SC20WE
		OHIP billing	X400, X402, X406, X407, X415
19	Abdominal pelvic MRI	CCI	3OT40VA, 3OT40WC, 3OT40WA, 3OT40WE
		OHIP billing	X451, X455, X461, X465
	Additional codes	OHIP billing	L393, G313, X091, G310, X090, G489, L067, G483, G010, L253, G372, J162, L445, X028, X036, L630, L650, L654, X037
		CCI	3GY10VA, 2HZ24JAXJ, 2ZZ13RA

GI - Gastrointestinal, ICD-10 - International Classification of Diseases version 10, OHIP - Ontario Health Insurance Plan, CCI - Canadian Classification of Health Interventions, FOBT - Faecal occult blood test, CT - Computed tomography, MRI - Magnetic resonance imaging

Codes for determining treatment start date (surgery, chemotherapy, or radiotherapy) after the diagnosis of colorectal cancer. Surgical codes represented colorectal resections and diversion. Radiotherapy dates utilized the ALR database, which records additional information around cancer-directed care at regional cancer centers in Ontario. Chemotherapy was identified using a standardized internal definition at ICES. The earliest date of any surgery, chemotherapy, or radiotherapy was used as the treatment start date.

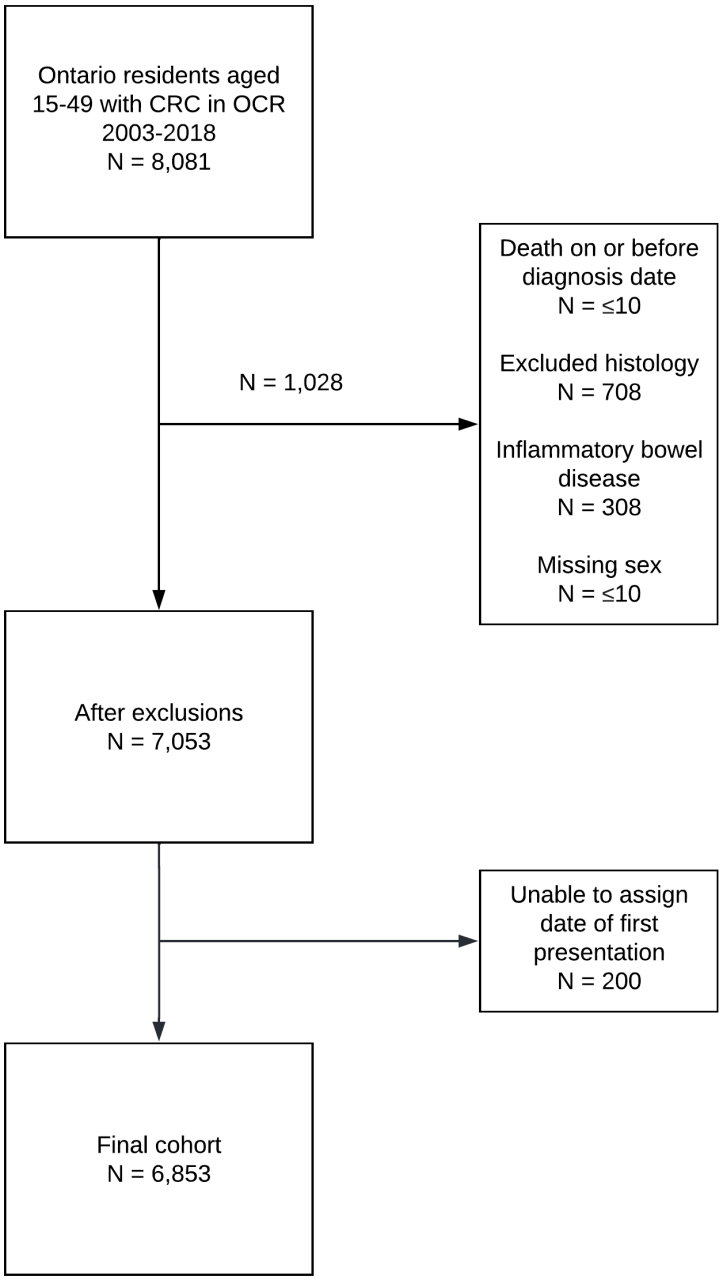
Type of initial treatment	Procedure and codes
Colorectal resection	OHIP billing codes - E718, S149, S157, S165, S166, S167, S168, S169, S171, S175, S177, S180, S184, S213, S214, S217, S312, S314
	CCI codes - 1NM87DE, 1NM87DF, 1NM87DN, 1NM87DX, 1NM87DY, 1NM87LA, 1NM87PN, 1NM87RD, 1NM87RE, 1NM87RN, 1NM87TF, 1NM87TG, 1NM89^, 1NM91^, 1NQ87CA, 1NQ87DE, 1NQ87DF, 1NQ87DX, 1NQ87LA, 1NQ87PB, 1NQ87PF, 1NQ87PN, 1NQ87RD, 1NQ87TF, 1NQ89^, 1NM59^, 1NQ59^
Radiotherapy	1. OHIP codes X311, X312, or X313 identified with body region code one of rectum, pelvic, anus, coccyx, or colon
	2. Date hierarchy given by i) first treatment date in ALR, ii) earliest OHIP code X311, X312, or X313, iii) first visit date in ALR
Chemotherapy (internal ICES definition)	1. Extract records for physician billings for chemotherapy (OHIP billing codes G281, G339, G345, G359, G381, G382, G388)
	2. Extract cancer clinic visits with main diagnosis as chemotherapy and diagnosis codes for colorectal cancer (ICD-10 C18.0-18.9, C19, C20)
	3. If patient has the above records in addition to a valid chemotherapy regimen name, they were considered to have chemotherapy

ICD-10 - International Classification of Diseases version 10, OHIP - Ontario Health Insurance Plan, CCI - Canadian Classification of Health Interventions, ALR - Cancer Activity Level Reporting

Supplementary Material 5. Differences between date of first presentation defined by the original algorithm with category-specific lookback cut-offs versus sensitivity analysis algorithms. Comparisons are among those in whom the origianl algorithm identified a date of first presentation.

Difference between date definitions	Original algorithm		Expanded algorithm	
	12 month cut-off	18 month cut-off	12 month cut-off	18 month cut-off
Days				
Median (IQR)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 179)
Mean, SD	4, 65	55, 126	25, 88	98, 154
Missing	<5	<5	<5	<5

Supplementary Material 6. Cohort creation figure for adults aged 15-49 diagnosed with colorectal cancer in Ontario from 2003 to 2018.



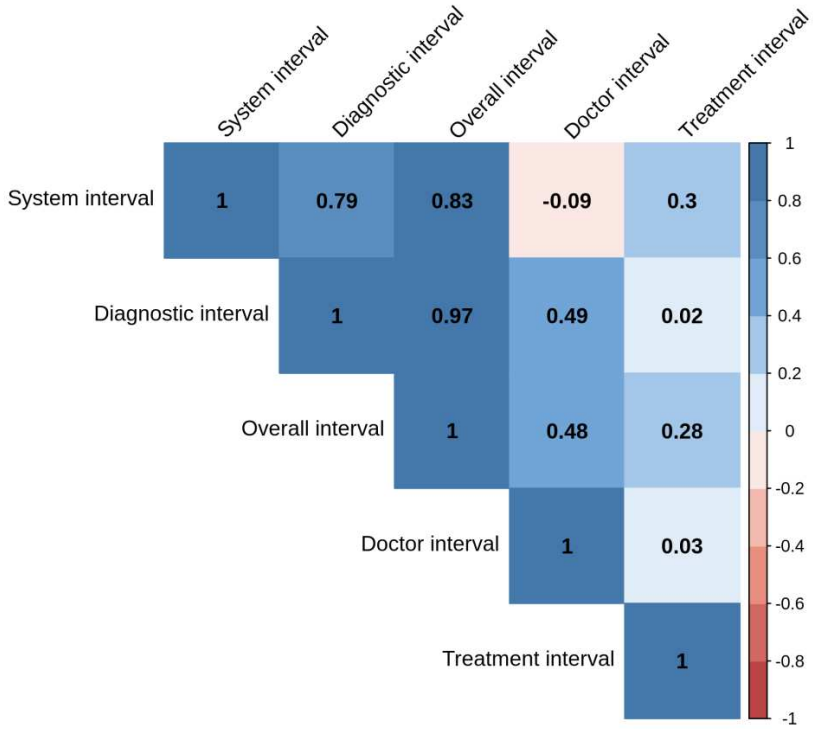
Supplementary Material 7. Characteristics and delay intervals for a cohort of colorectal cancer patients <50 years stratified by sex.

Characteristic	Overall N = 6,853	Male N = 3,587	Female N = 3,266	p-value
Age (years)	45.0 (40.0, 47.0)	45.0 (40.0, 47.0)	45.0 (40.0, 47.0)	0.3
ON-Marg Summary Score	3.00 (2.25, 3.50)	3.00 (2.25, 3.50)	3.00 (2.25, 3.50)	0.7
Missing	76	39	37	
Income quintile				0.8
1	1,174 (17%)	603 (17%)	571 (18%)	
2	1,154 (17%)	596 (17%)	558 (17%)	
3	1,234 (18%)	664 (19%)	570 (17%)	
4	1,298 (19%)	680 (19%)	618 (19%)	
5	1,231 (18%)	652 (18%)	579 (18%)	
Rural	748 (11%)	385 (11%)	363 (11%)	
Missing	14	7	7	
Stage				0.4
I	884 (14%)	456 (13%)	428 (14%)	
II	1,082 (17%)	585 (17%)	497 (16%)	
III	1,939 (30%)	1,015 (30%)	924 (30%)	
IV	1,321 (20%)	665 (19%)	656 (21%)	
Pre-2007	1,320 (20%)	707 (21%)	613 (20%)	
Missing	307	159	148	
Disease site				<0.001
Proximal colon	2,363 (34%)	1,210 (34%)	1,153 (35%)	
Rectum	2,103 (31%)	1,221 (34%)	882 (27%)	
Sigmoid and rectosigmoid	2,387 (35%)	1,156 (32%)	1,231 (38%)	
Use of lower GI endoscopy in patient LHIN (procedures per 100,000 residents in last year)	4,181 (3,411, 4,648)	4,169 (3,379, 4,646)	4,194 (3,440, 4,651)	0.13
Time from presentation to first abdominal/pelvic CT or MRI (days)				<0.001
Median (IQR)	46 (7, 142)	39 (4, 116)	57 (10, 167)	
Mean (SD)	92 (108)	82 (103)	102 (112)	
Range	0, 500	0, 471	0, 500	
Missing	4,221	2,238	1,983	
Time from presentation to first lower endoscopy (days)				<0.001
Median (IQR)	70 (28, 163)	61 (23, 140)	87 (34, 188)	
Mean (SD)	111 (108)	98 (103)	124 (112)	
Range	0, 493	0, 493	0, 488	
Missing	1,680	881	799	
Doctor interval (presentation to first investigation; days)				0.11
Median (IQR)	5 (0, 36)	4 (0, 35)	5 (0, 39)	
Mean (SD)	36 (68)	35 (67)	37 (68)	
Range	0, 462	0, 454	0, 462	
Missing	99	56	43	
System interval (first investigation to treatment; days)				<0.001
Median (IQR)	77 (36, 160)	66 (33, 139)	89 (41, 182)	
Mean (SD)	114 (107)	103 (102)	126 (111)	
Range	0, 763	0, 530	0, 763	
Missing	470	250	220	
Diagnostic interval (presentation to diagnosis; days)				<0.001
Median (IQR)	78 (28, 186)	65 (23, 160)	96 (34, 215)	
Mean (SD)	121 (117)	108 (112)	134 (120)	

Characteristic	Overall N = 6,853	Male N = 3,587	Female N = 3,266	p-value
Range	0, 519	0, 503	0, 519	
Treatment interval (diagnosis to treatment; days)				0.6
Median (IQR)	23 (7, 40)	24 (6, 41)	23 (7, 40)	
Mean (SD)	29 (31)	29 (32)	29 (30)	
Range	0, 357	0, 350	0, 357	
Missing	384	198	186	
Overall interval (presentation to treatment; days)				<0.001
Median (IQR)	109 (55, 218)	98 (51, 196)	125 (62, 240)	
Mean (SD)	148 (121)	137 (118)	161 (124)	
Range	0, 763	0, 598	0, 763	
Missing	384	198	186	

Presented are Median (IQR) or N (%) unless otherwise specified

GI – gastrointestinal, LHIN – Local Health Integration Network, CT – computed tomography, MRI – magnetic resonance imaging



Supplementary Material 8. Correlation plot showing correlation between each delay measure. Positive values indicate positive correlation, ranging from -1 to +1. All correlations shown were statistically significant ($p<0.02$), aside from the diagnostic interval and treatment interval relationship ($p = 0.085$). Contiguous intervals include the doctor interval/system interval and the diagnostic/treatment interval.

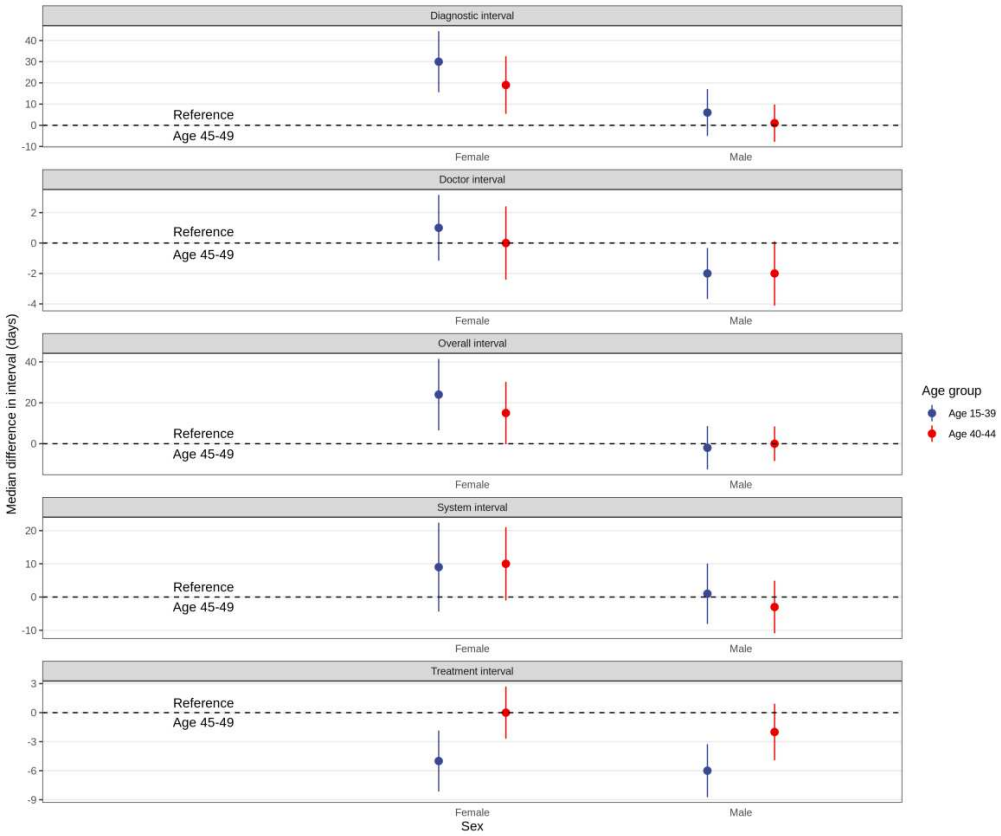
Supplementary Material 9. Univariate quantile regression for delay intervals of interest with patient and disease characteristics.

Characteristic	Overall interval			Overall interval						Overall interval					
				Doctor interval			System interval			Diagnostic interval			Treatment interval		
	Median diff.	p-value	N	Median diff.	p-value	N	Median diff.	p-value	N	Median diff.	p-value	N	Median diff.	p-value	N
Age (Increase in 5 years)	-1.8 (-4.6 to 1.1)	0.234	6,469	0.3 (-0.3 to 0.9)	0.33	6,754	-0.6 (-2.7 to 1.4)	0.547	6,383	-4.7 (-7.7 to -1.7)	0.002	6,853	2 (1.4 to 2.6)	<0.001	6,469
Sex			6,469			6,754			6,383			6,853			6,469
Male	Ref			Ref			Ref			Ref			Ref		
Female	27 (20.7 to 33.3)	<0.001		1 (-0.6 to 2.6)	0.207		23 (16.7 to 29.3)	<0.001		30 (23.3 to 36.7)	<0.001		-1 (-2.9 to 0.9)	0.302	
ON-Marg Summary Score (Increase in 1 point)	5.3 (1.4 to 9.3)	0.008	6,400	-0.8 (-1.7 to 0.1)	0.069	6,682	4.8 (1.2 to 8.4)	0.008	6,318	8.4 (3.7 to 13.1)	<0.001	6,777	-1.3 (-2.3 to -0.4)	0.006	6,400
Disease site			6,469			6,754			6,383			6,853			6,469
Proximal colon	Ref			Ref			Ref			Ref			Ref		
Sigmoid and rectosigmoid	15 (7.4 to 22.6)	<0.001		3 (1.4 to 4.6)	<0.001		10 (3.5 to 16.5)	0.003		9 (1.1 to 16.9)	0.026		9 (7.1 to 10.9)	<0.001	
Rectum	23 (14.3 to 31.7)	<0.001		6 (4.5 to 7.5)	<0.001		13 (6.1 to 19.9)	<0.001		7 (-1 to 15)	0.087		20 (18.2 to 21.8)	<0.001	
Stage			5,032			5,163			4,974			5,226			5,032
I	Ref			Ref			Ref			Ref			Ref		
II	-44 (-57.7 to -30.3)	<0.001		-8 (-10.8 to -5.2)	<0.001		-29 (-39 to -19)	<0.001		-30 (-44.9 to -15.1)	<0.001		-13 (-16.1 to -9.9)	<0.001	
III	-45 (-56.8 to -33.2)	<0.001		-6 (-8.9 to -3.1)	<0.001		-29 (-37.7 to -20.3)	<0.001		-36 (-47.2 to -24.8)	<0.001		-11 (-13.9 to -8.1)	<0.001	
IV	-69 (-80.4 to -57.6)	<0.001		-9 (-11.7 to -6.3)	<0.001		-47 (-55.4 to -38.6)	<0.001		-57 (-67.7 to -46.3)	<0.001		-17 (-19.9 to -14.1)	<0.001	
Use of lower GI endoscopy in patient LHIN (Increase in 1000 procedures per 100,000 residents per year)	-5.5 (-9.8 to -1.3)	0.011	6,469	-0.7 (-1.6 to 0.1)	0.103	6,754	-1.5 (-4.9 to 1.9)	0.397	6,383	-7.5 (-11.5 to -3.5)	<0.001	6,853	3.7 (2.9 to 4.5)	<0.001	6,469
Year of diagnosis (Increase in 1 year)	-0.7 (-1.4 to 0)	0.048	6,469	-0.2 (-0.3 to -0.1)	0.008	6,754	-0.1 (-0.7 to 0.5)	0.719	6,383	-1.3 (-2.1 to -0.6)	<0.001	6,853	0.8 (0.6 to 1)	<0.001	6,469

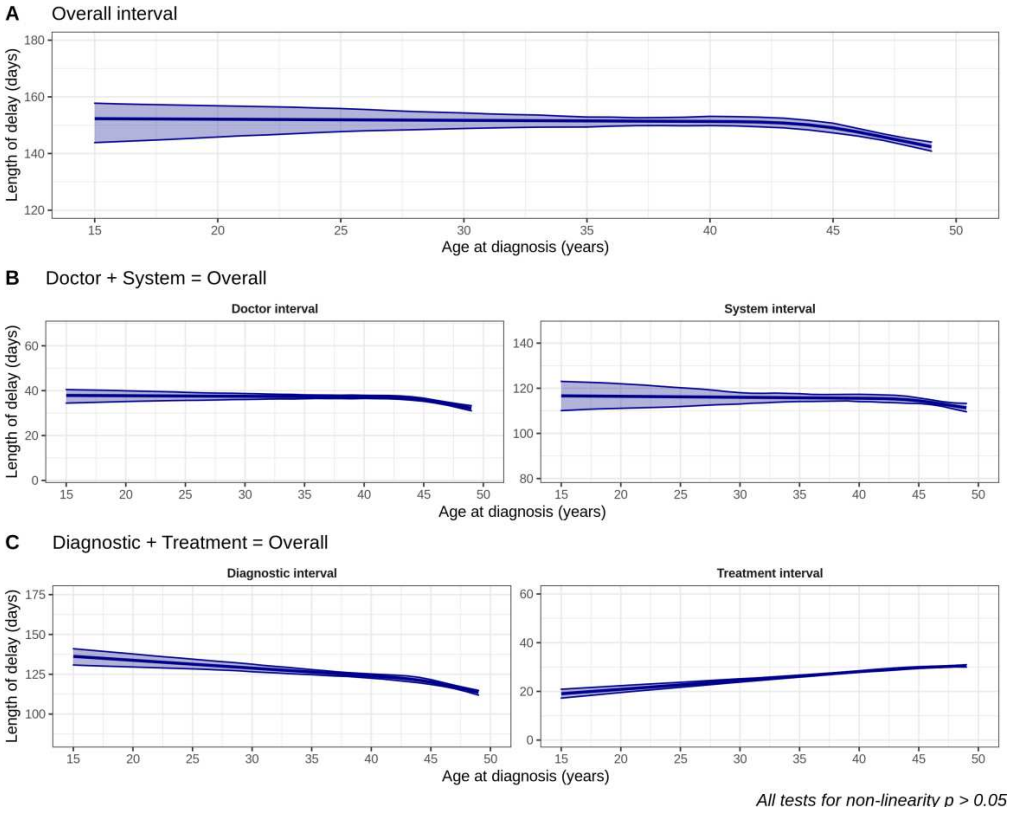
Effect estimates are presented as median days with 95% confidence intervals

Stage was available only for patients diagnosed in 2007 and later

GI – gastrointestinal, LHIN – Local Health Integration Network



Supplementary Material 10. Unvariate quantile regression between younger and older patients, stratified by sex.



Supplementary Material 11. Restricted cubic spline regression (3 knots) for delay measures of interest over age 15-49. No interval was found to have a significantly non-linear relationship with age using nested likelihood ratios tests.