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Original Article

Restorative Surgery after Colectomy for Ulcerative Colitis in England and Sweden: Observations from a Comparison of Nationwide Cohorts

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Abstract

Background

A longstanding disparity exists between the approaches to restorative surgery after colectomy for patients with ulcerative colitis (UC) in England and Sweden. This study aims to compare colectomy and restorative surgery rates in comparable national cohorts.

Method

The English Hospital Episode Statistics (HES) and Swedish National Patient Register (NPR) were interrogated between 2002 and April 2012. Patients with two diagnostic episodes for UC, age ≥15 were included. Patients were excluded if they had an episode of inflammatory bowel disease or colectomy before 2002. The cumulative incidences of colectomy and restorative surgery were calculated using Kaplan-Meier method.

Results

In total 98,691 patients were included in the study, 76,129 in England and 22,562 in Sweden. The 5-year cumulative incidence of all restorative surgery after colectomy in England was 33% versus 46% in Sweden (p-value <0.001). Of the patients undergoing restorative surgery, 92.3% of English patients had a pouch versus 38.8% in Sweden and 7.7% versus 59.1% respectively had an ileorectal anastomosis (IRA). The 5-year cumulative incidence of colectomy in this study cohort was 13% in England and 6% in Sweden (p-value <0.001).

Conclusion

Following UC colectomy, only one third of English patients and half of Swedish patients undergo restorative surgery. In England nearly all these patients underwent pouches, in Sweden a less significant majority underwent IRAs. It is surprising to demonstrate this discrepancy in a comparable cohort of patients from similar healthcare systems. The causes and consequences of this international variation in management are not fully understood and require further investigation.

What does this paper add to the literature?

Using nationwide administrative healthcare data this study suggests that fewer patients undergo restorative surgery after colectomy for ulcerative colitis in England than in Sweden. Ileoanal pouches are more common in England and ileorectal anastomoses in Sweden. These results have the potential to influence the management of UC in both countries.

Introduction

Ulcerative colitis (UC) is a relapsing remitting inflammatory bowel disease (IBD) affecting the rectum and colon in a retrograde pattern of inflammation, starting at the rectum. The majority of patients are managed with medical therapy, however a significant minority will eventually require colectomy (1). The reported 5-year and 10-year cumulative risks of colectomy range between 3-13% and 10-25%, respectively, but no nationwide study has been performed (2).

In order to live without a permanent ileostomy following a colectomy, patients may choose to undergo restorative surgery in the form of an ileal pouch, ileorectal anastomosis (IRA) or continent ileostomy. In the UK the ileal pouch is the most popular restorative option, but in Sweden patients are more likely to receive an IRA after colectomy (3). In Sweden it has previously been shown that less than half of the patients underwent further restorative surgery after a colectomy for IBD (4). Whether the situation is similar in England is unknown, and whether the cumulative risk of colectomy could explain potential differences needs further exploration.

This study aims to utilise national routinely collected administrative data to investigate the differences in the surgical management of patients with UC in England and Sweden, particularly in regard to the comparative likelihood of patients undergoing restorative surgery after colectomy in the two countries.

Method

The English nationwide registers

The English National Health Service (NHS) Hospital Episode Statistics (HES) data have been described previously (5). They include diagnostic, procedural, demographic and

geographical data for all NHS secondary care episodes in England. There is a very small minority of patients receiving private healthcare in NHS hospitals. The HES data are linked to Office of National Statistics (ONS) data to record death outside of hospital. HES have been recorded for patients admitted to hospital care since 1989 and outpatient secondary care since 2003. The accuracy has increased significantly after the introduction of Payment by Results (PbR) in 2003 and the Audit Commission review of 2009 to 2010 concluded procedural coding (using the Office of Population Census and Surveys version 4 (OPCS4)) accuracy of 90% and diagnostic coding (using the International Statistical Classification of Diseases and Related Health Problems version 10 (ICD-10)) accuracy of 89%, although this will be higher if only three-digit diagnostic coding is used, as is the case in this study (6).

The Swedish nationwide registers

The Swedish nationwide population-based registers of patient care, cancer, causes of death, and emigration were used (7–9). The Swedish health care service is available to all residents, to whom unique personal identification numbers are assigned, making it possible to identify all residents and follow them through register linkages (10). Swedish inpatient diagnoses have been registered in the National Patient Register (NPR) since January 1, 1964, with a nationwide coverage since 1987. Since January 1, 2001, non-primary outpatient care has been registered in the Patient Register. The Swedish NPR also uses ICD-10 diagnostic codes since 1997, but uses Nordic Medico-Statistical Committee (NOMESCO) procedural codes.

Study population

The nationwide English and Swedish data were used to identify incident cases of UC between April 1997 and April 2012. Patients were included in the study if they had two separate events (inpatient episodes including endoscopy visits and visits for administration of biologic drugs in England, and inpatient or non-primary outpatient episodes in Sweden) with a primary or secondary diagnostic code for UC (ICD-10: K51) between January 2002 and April 2012. Patients were excluded if they were diagnosed with UC before the age of 15. Patients were also excluded from the study if they had a diagnostic episode for UC or Crohn's Disease (CD, ICD-10: K50), colectomy or restorative surgery before 2002. A 'washout

period' of at least five years was utilised to select a population who had neither been diagnosed with IBD nor underwent a colectomy before 2002.

Patients were followed longitudinally from their first episode with a diagnostic code for UC until the 30th of April 2012, date of death or date of emigration (in Sweden only), which ever came first.

UC surgery

The OPCS and NOMESCO procedural codes are included in appendix 1 for England and Sweden respectively, and were used to identify patients in whom colectomy and restorative procedures (IRA, pouch or continent ileostomy) were performed. Primary IRA and pouch surgery were defined as procedures performed in conjunction with the colectomy, whereas secondary IRA and pouch surgery were restorative surgeries performed at a later stage. Only the first restorative surgery was accounted for. On preliminary analysis of the English data it was clear that the code for continent ileostomy (G74.1) was used inaccurately as a code for ileostomy, with over 400 recorded procedures. This code was excluded from the English analysis.

Co-variates

Patients were classified into five categories according to age at UC diagnosis (15-29, 30-44, 45-59, ≥60 years). The same cut-offs were used for age at colectomy. Five categories were used to classify year of UC diagnosis (2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2012 (April)), and the same categories were used for year of colectomy. Presence of a diagnosis of primary sclerosing cholangitis (the international classification of diseases, tenth revision (ICD10): K83.0) were extracted from the registers at the time of UC diagnosis as well as at the time of colectomy. The Cancer Register was used in Sweden to identify diagnosis of colorectal cancer (ICD7: 153 and 1540) before UC diagnosis and at the time of colectomy. In England ICD10 codes for colorectal cancer were used: C18-C20.

Analysis

Descriptive statistics were performed on demographic and diagnostic variables shared between both national registries as described above. The cumulative incidence of colectomy

and restorative surgery were estimated using the Kaplan-Meier method, and the log-rank test was used to calculate p-values. English HES data were analysed in SPSS (IBM Corp. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) and Swedish data with Stata 14 (StataCorp, TX, USA). Statistical tests were 2-sided, and statistical significance was set at $p \leq 0.05$. The researchers only had access to de-identified data. The study had been approved by the Ethical vetting board in London (HRA NRES 2013: REC Reference 13/LO/1235), and in Stockholm, Sweden, (DNR of ethical approvals including amendments: 2007/785-31/5; 2015/1030-32). The study is reported as per the STROBE guidelines (11).

Sensitivity analysis

The total national populations were also used as denominators, using the 2007 population for each country as this was the mid-point of follow up (12,13).

Results

In total 98,691 patients were included in the study, 76,129 in England and 22,562 in Sweden (figure 1). Table 1 shows the demographic data for patients included in the study. The sex distribution was similar in the two cohorts, the median age at the first UC episode was younger in the Swedish cohort (42 years vs 52 years). The maximum length of follow-up was 10 years, 3 months. The mean average length of follow-up was 5.15 years in the English cohort, 5.27 in the Swedish cohort.

Colectomies

During follow-up 10,557 colectomies were performed. Colectomies were performed in 12% (n=9,118) of the English patients and 6% (n=1,439) of the Swedish patients (figure 1 and Table 2). There was no difference in age at colectomy, or presence of colorectal cancer prior to colectomy, but more Swedish patients had diagnostic codes for primary sclerosing cholangitis listed in admissions up to the time of colectomy (3% vs 1%). The cumulative incidence of colectomy at 5 years was 13% in England and 6% in Sweden (table 3 and figure 2) (p-value <0.001).

Sensitivity analysis

A sensitivity analysis was performed using the total population as the denominator (table 4). The UC study cohorts per 2007 population - 76,129/51,381,100 in England and

22,562/9,182,927 in Sweden accounts to raw prevalence of $1.5/10^5$ and $2.5/10^5$ respectively. The gross colectomy rates per capita of the total country population are $0.18/10^5$ in England (9,118/51,381,100) and $0.16/10^5$ in Sweden (1,439/9,182,927) (p-value <0.001).

Restorative surgery

The crude rate of restorative surgery after colectomy in England was 29.6% versus 41.4% in Sweden. Table 5 and figure 3 show that the cumulative incidence in England and Sweden at one year was 0.24 and 0.29, at three years 0.32 and 0.43, and at five years 0.33 and 0.46, respectively (p-value <0.001).

After colectomy in England and Sweden, 27.6% vs 16.1% of patients underwent pouch operations and 2.3% vs 24.5% underwent IRA respectively. As a proportion of restorative procedures, pouches accounted for 92.3% in England and 38.8% in Sweden, and IRAs 7.7% and 59.1%, respectively.

Discussion

The main finding from this study is that the rate of restorative surgery for UC patients undergoing colectomy is lower in England than in Sweden. Only one third of patients in England underwent a restorative procedure within five years of undergoing a colectomy compared with nearly half in Sweden. The data have also confirmed that the choice of restorative procedure differs in the two countries. During the study period 92% of the English patients undergoing restorative surgery had an ileal pouch, whereas in Sweden 59% of restorative procedures were an IRA and only 39% a pouch. The study suggests that the colectomy rate is higher in England than in Sweden, but this finding should be treated with caution and is discussed later in this section.

This paper reports the first international comparison of two nationwide cohorts of patients with UC undergoing surgery. As global benchmarking and shared international experience in healthcare are becoming more commonplace, this study contributes to the literature by highlighting discrepancy in the management of the same condition in two developed healthcare systems.

Surprisingly only one third of the UC patients in England underwent restorative surgery following a colectomy. The corresponding number was higher in Sweden, but still under 50%. The reasons for this comparatively low proportion of young patients undergoing restorative surgery are uncertain. The reasons for the surprisingly low rate of restorative surgery are unknown and likely multifactorial. For a patient to undergo restorative surgery for UC there are patient and surgeon/hospital related factors. The patient must be a suitable candidate in regard to their sphincter function and disease-related factors, they must be aware of the option for restorative surgery and have a preference for avoiding a permanent ileostomy. The surgical team must ensure that the patient is well informed and given a balanced view regarding a permanent ileostomy versus restorative surgery. Previous research in Sweden and New York has suggested that patients undergoing their colectomy in low volume restorative surgery centres have a lower risk of subsequent restorative surgery (4,14). In New York the patient-related factors influenced subsequent pouch surgery more than surgeon-related factors. It is not known if the same volume outcome relationship is true in England and this should be the subject of future research.

One difference between the two countries is the surgical procedure employed. In England, almost all patients received a pouch and in Sweden IRA was the most commonly used technique. The long-term implications for quality of life when comparing reconstruction with a pouch to IRA are yet to be established. One perceived advantage with pouch surgery is the lower failure rate when compared to that following an IRA (15–17). It should, however be noted that failure of an ileal pouch necessitates permanent ileostomy (although conversion to continent ileostomy is technically possible but rarely performed (18)), whereas failure of an IRA leaves the option of conversion to a pouch. In a previous Swedish NPR study including 265 patients in whom the IRA failed, 76 (28.7%) were converted to a pouch. The function following conversion of IRA to pouch seems reasonable in patients with Familial Adenomatous Polyposis patients, and probably in patients with UC (19,20). Another disadvantage with IRA is the potential risk of cancer, and yearly surveillance of the rectal remnant is needed (21,22).

IRAs have the perceived advantage of being less technically demanding and, in combination with careful patient selection and medical management of the rectal remnant, may represent an interim measure for some patients requiring colectomy. An algorithm for the

management of the rectum after colectomy has been published previously, and includes topical 5-ASA enemas to reduce inflammation and increase rectal compliance (23).

Beyond the advantages and disadvantages described above, it is not known why the discrepancy in the choice of restorative options exists between England and Sweden. The pouch was developed and popularised in the UK, but this does not explain the preference in North America and many other European countries. It is possible that ulcerative colitis is phenotypically different in Sweden, with relative rectal sparing and so IRAs are better tolerated by patients. It may be explained by the greater geographical distances to specialist colorectal hospitals in Sweden, making access to surgeons performing pouch surgery more difficult than in the UK. These points are speculative, and should be answered in further research studies. There has been a reappraisal of the IRA in Sweden prompted by the desire to avoid the impact on female fecundity associated with pelvic surgery. There are now more effective medical treatment options and more sensitive endoscopic surveillance than when the pouch was developed and in very select patients an IRA is an appropriate first restorative procedure (23).

This is the first nationwide study comparing the cumulative risk of colectomy in UC patients in two countries. The 5-year cumulative risk of colectomy was lower in Sweden than in England. When interpreting the English data, it should be noted that it is difficult to define the true size of the UC population due to a lack of reliable outpatient diagnostic coding (therefore outpatient HES data were not used for this study). The HES data for admitted patient care used for this study do include endoscopy visits and administration of high cost medications by infusion. Because of the likelihood of a patient with UC requiring at least one endoscopy over a 10-year period, and most patients undergo an endoscopy at the time of UC diagnosis, we believed that most UC patients would be captured. Given, however that the five-year cumulative risk of colectomy in England was twice as high as in Sweden but the number of UC colectomies per 100,000 total population were similar in the two countries, it is likely that not all English UC patients were identified. The NPR has more reliable outpatient data and has been validated for capturing IBD patients with a positive predictive value for true IBD of 93% with two diagnoses of IBD and 79% for two diagnoses of UC (24).

The validity of HES for identifying patients with IBD has not been confirmed in a similar fashion.

This study is a unique comparison of the surgical management of comparable nationwide cohorts of UC patients from two healthcare systems in which universal patient identification allows longitudinal tracking. Nationwide, population-based data collected in routine medical care reflects real-world practice as opposed to the strict conditions of controlled trials, and the very large sample size results in excellent precision. The 10-year follow up period is adequate, as over 90% of patients undergoing restorative surgery have done so by three years after colectomy. A washout period of at least five years was used to ensure that we captured only incident cases. The Swedish cohort is based on the NPR with a complete registration of in-hospital as well as outpatient visits, and a validated method of capturing IBD cases. The English cohort is based on HES data with validated accuracy regarding diagnostic and procedural coding (25). However, it is possible that not all English UC patients were identified in the HES data, and that the true cumulative risk of colectomy is indeed lower than reported in this study. It should be noted that this weakness is unlikely to affect the capture of true UC colectomies as HES covers all of the inpatient population. Therefore, the gross number of colectomies and the rate of restorative surgery can be considered reliable.

In regard to other weaknesses of the methodology some are inherent to all international comparison studies of administrative healthcare data; namely procedural coding discrepancies, clinician versus professional coder input of data, limited comparable clinical outcome measures (26). As in most registry studies there was no detailed clinical information available. It is possible that the differences in colectomy and restorative rates between England and Sweden could be explained by differences in disease phenotype and administrated drugs – information that could not be attained reliably in both data sets.

This study raises questions in how gastroenterology and colorectal management practices differ in the two countries in regard to counselling and preparing patients for permanent stoma, pouch or IRA. Also it questions what the long term quality of life implications are for patients reconstructed with a pouch versus and IRA.

Conclusion

Following a UC colectomy, only one third of English patients and nearly half of Swedish patients undergo restorative surgery. In England, nearly all these patients underwent pouches and a less significant majority in Sweden underwent IRAs. It is surprising to demonstrate such a discrepancy in a comparable cohort of patients from two similar healthcare systems. The reasons for and consequences of this international variation in management are not fully understood and require further investigation to establish the best possible care for patients requiring surgery for UC.

Contributors

GW and CN contributed equally to this paper. GW conceived and designed the study, extracted, analysed and interpreted the data, drafted and revised the manuscript and approved the final version for publication. CN conceived and designed the study, extracted, analysed and interpreted the data, revised the manuscript and approved the final version for publication. OF and PM conceived and designed the study, analysed and interpreted the data, revised the manuscript and approved the final version for publication. MB designed the study, extracted, analysed and interpreted the data and approved the final version for publication. OO acquisitioned the Swedish data, designed the study, interpreted the data, revised the manuscript and approved the final version for publication. AE, AA, EB, TP and AA designed the study, interpreted the data, revised the manuscript and approved the final version for publication.

Transparency Declaration

The guarantor, OF, affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

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Declaration of interests

The authors declare that we have no conflicts of interest.

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Table 1. Descriptive characteristics of all incident adult UC cases in England and Sweden between 2002 and 2012.

	English		Swedish	
	N	%	N	%
All	76129		22562	
Female	36678	48.2	10674	47.3
Male	39451	51.8	11888	52.7
AT UC DIAGOSIS				
Age at first UC episode				
Median (range)	52	15-105	42	15-96
15-29 years	13013	17.1	6192	27.4
30-44 years	16888	22.2	6013	26.7
45-59 years	17975	23.6	5124	22.7
60- years	28239	37.1	5233	23.2
Year of diagnosis				
2002-2003	15572	20.5	5610	24.9
2004-2005	15719	20.6	4284	19.0
2006-2007	16209	21.3	4216	18.7
2008-2009	15943	20.9	4447	19.7
2010-2012 (April)	12686	16.7	4005	17.8
Colorectal cancer	684	0.9	151	0.7
Primary sclerosing cholangitis	552	0.7	165	0.7

Table 2. Descriptive characteristics of all colectomy and restorative surgery patients

	English		Swedish	
	N	**%**	**N**	**%**
Colectomies	9118	12.0[1]	1439	6.4[1]
At the time of colectomy:				
Median age (range)	46	15-92	43	15-93
Colorectal cancer diagnosis	394	4.3	78	5.4
PSC diagnosis	82	0.9	43	3.0
No restorative surgery	**6418**	**70.4**	**843**	**58.6**
Restorative surgery	**2700**	**29.6**	**596**	**41.4**
Female	1133	42.0	211	35.4
Male	1567	58.0	385	64.6
Laparoscopic	305	11.3	10	1.7
First restorative surgery				
IRA	208	2.3	352	24.5
-primary	135		111	
IPAA	2492	27.3	231	16.1
-primary	943		59	
Continent ileostomy	NR	-	13	0.9
-primary	-	-	1	
At the time of restorative surgery:				
Median age (range)	36	15-86	36	16-80
Colorectal cancer	62	2.3	40	6.7
Primary sclerosing cholangitis	27	0.1	23	3.9

[1]Proportion of the entire UC cohort in each country.

Table 3. Cumulative incidence of colectomy in patients diagnosed with UC in 2002 to 2012.

	Number at risk		Colectomies		Cumulative incidence		Standard error	
	English	Swedish	English	Swedish	English	Swedish	English	Swedish
1 year	64488	20496	5295	711	0.07	0.03	0.001	0.001
2 years	56741	18391	1463	243	0.09	0.04	0.001	0.001
3 years	49077	16305	806	154	0.11	0.05	0.001	0.002
5 years	33915	11968	359	180	0.13	0.06	0.001	0.002
10 years	2799	1295	32	150	0.16	0.08	0.002	0.003

Table 4. The prevalence of UC and UC procedures by national population

	England		Sweden		English/Swedish ratio
Total Population Estimate 2007 (12,13)	51,381,100		9,182,917		5.6:1
	N	Per 10^5 population	N	Per 10^5 population	
UC study cohort	76,129	1.5	22,562	2.5	3.4:1
UC colectomies	9,118	0.18	1,439	0.16	6.3:1
Patients restored	2,700	0.053	596	0.065	4.5:1

Table 5. Cumulative incidence of restorative surgery in 9,118 English and 1,439 Swedish patients in whom colectomy was performed after UC diagnosis.

	Number at risk		Restorative surgery		Cumulative incidence		Standard error	
	English	Swedish	English	Swedish	English	Swedish	English	Swedish
1 year	5793	912	2045	400	0.24	0.29	0.005	0.01
2 years	4506	682	492	133	0.31	0.40	0.005	0.01
3 years	3702	549	101	37	0.32	0.43	0.005	0.01
5 years	2374	365	20	21	0.33	0.46	0.005	0.01
10 years	104	10	0	5	0.33	0.48	0.006	0.02

*Figure 1 Flow diagram demonstrating the study cohort in England and Sweden. *All percentages relate to the level immediately above. N.B. 13 Swedish patients received continent ileostomies as their first reconstruction.*

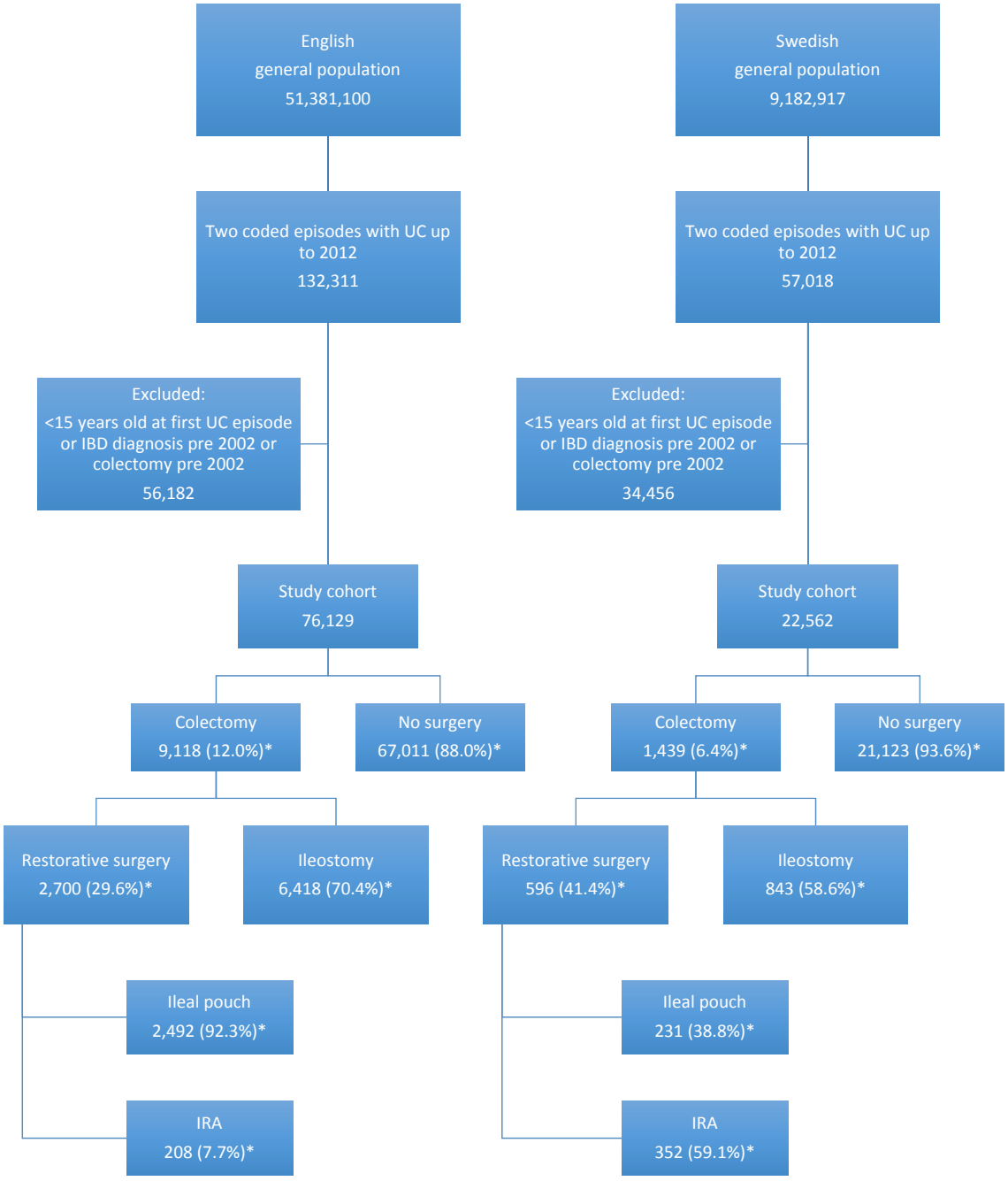


Figure 2 Cumulative risk of colectomy in all incident UC cases diagnosed in 2002 to 2012 stratified by country (England: Light grey, Sweden: Dark grey)

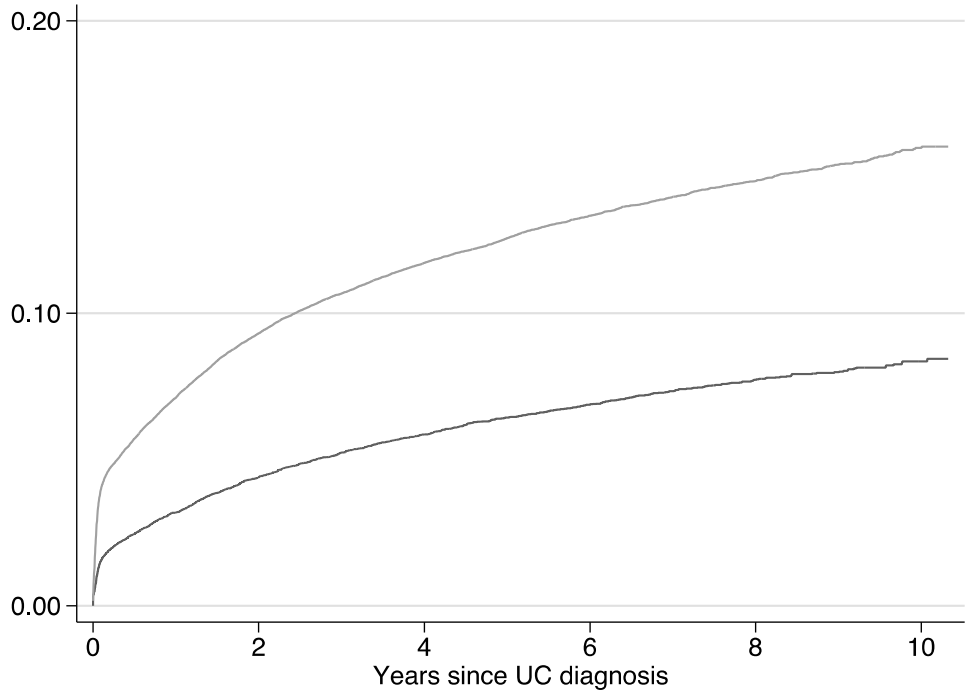
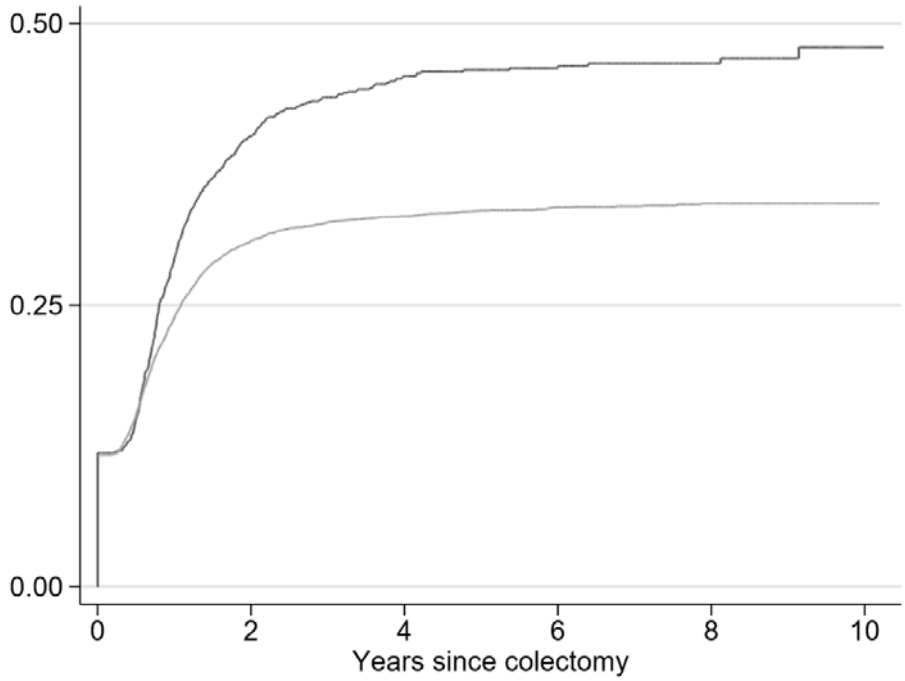


Figure 3 Cumulative chance of reconstructive surgery in patients diagnosed with UC in 2002 to 2012 and undergoing colectomy stratified by country (England: Light grey, Sweden: Dark grey)



Appendix 1: OPCS and NOMESCO Procedural Codes

English Colectomy Codes	
OPCS Code	**Description**
H041	Panproctocolectomy and ileostomy
H042	Panproctocolectomy and anastomosis of ileum to anus and creation of pouch
H043	Panproctocolectomy and anastomosis of ileum to anus
H048	Other specified total excision of colon and rectum
H049	Unspecified total excision of colon and rectum
H051	Total colectomy and anastomosis of ileum to rectum
H052	Total colectomy and ileostomy and creation of rectal fistula
H053	Total colectomy and ileostomy
H058	Other specified total excision of colon
H059	Unspecified total excision of colon
H111	Colectomy and end to end anastomosis of colon to colon
H112	Colectomy and side to side anastomosis of ileum to colon
H113	Colectomy and anastomosis
H114	Colectomy and ileostomy
H115	Colectomy and exteriorisation of bowel
H298	Other specified subtotal excision of colon
H299	Unspecified subtotal excision of colon
H291	Subtotal excision of colon and rectum and creation of colonic pouch and
H292	Subtotal excision of colon and rectum and creation of colonic pouch
H293	Subtotal excision of colon and creation of colonic pouch and anastomosis of colon
H294	Subtotal excision of colon and creation of colonic pouch

English Restorative Surgery Codes	
OPCS Code	**Description**
	Pouch
H042	Panproctocolectomy and anastomosis of ileum to anus and creation of pouch
G725	Anastomosis of ileum to anus and creation of pouch
H043	Panproctocolectomy and anastomosis of ileum to anus
H291	Subtotal excision of colon and rectum and creation of colonic pouch and anastomosis of colon to anus
H292	Subtotal excision of colon and rectum and creation of colonic pouch
H293	Subtotal excision of colon and creation of colonic pouch and anastomosis of colon to rectum
H294	Subtotal excision of colon and creation of colonic pouch
	IRA
H051	Total colectomy and anastomosis of ileum to rectum
G724	Anastomosis of ileum to rectum

Swedish Procedural Codes	
NOMESCO Code	**Description**
JFH	**All Colectomies**
	Subtotal colectomy with end ileostomy
JFH10	Colectomy and ileostomy, with closure of the rectum
JFH11	Laparoscopic colectomy and ileostomy
JFH96	Other colectomy
	Proctocolectomy with IPAA (ileal pouch anal anastomosis)
JFH30	Colectomy, rectal mucosectomy and ileoanal anastomosis *without* ileostomy.
JFH33	Colectomy, rectal mucosectomy and ileoanal anastomosis *and* ileostomy.
JGB50	Mucosectomy and ileoanal anastomosis after previous colectomy.
JGB60	Excision of rectum or making of an ileoanal anastomosis after previous colectomy.
JGB61	Laparoscopic excision of rectum or making of an ileoanal anastomosis after previous colectomy.
	Colectomy with IRA (ileorectal anastomosis)
JFH00	Colectomy with ileorectal anastomosis
JFH01	Laparoscopic colectomy with ileorectal anastomosis
JFC40	Ileorectal anastomosis
JFC41	Laparoscopic ileorectal anastomosis
JFG26	Closure of enterostomy with anastomosis to colon
JFG29	Closure of enterostomy with anastomosis to the rectum
	Continent ileostomy at time of colectomy
JFH40	Proctocolectomy with continent ileostomy
JFG60	Conversion of a conventional ileostomy to a continent ileostomy