

Table S1 Abdominal pain codes

Medcode	Description
177	Abdominal pain
421	Iliac fossa pain
716	[D]Abdominal cramps
1763	[D]Abdominal pain
1976	Abdominal pain type
2056	[D]Abdominal colic
2234	[D]Recurrent acute abdominal pain
2383	Abdominal discomfort
3338	[D]Abdominal pain NOS
3978	Upper abdominal pain
4617	Central abdominal pain
4771	[D]Umbilical pain
5691	Non-colicky abdominal pain
5782	O/E - abdomen tender
5960	Site of abdominal pain
7726	[D]Right upper quadrant pain
7812	Colicky abdominal pain
8362	[D]Left upper quadrant pain
8436	[D]Upper abdominal pain
9061	[D]Left lower quadrant pain
9695	Right upper quadrant pain
11070	General abdominal pain-symptom
15908	Appendicular colic
16402	[D]Abdominal tenderness
17636	O/E - umbilical pain on palp.
19283	[D]Nonspecific abdominal pain
19360	[D]Right lower quadrant pain

Medcode	Description
22608	Lower abdominal pain
23756	[D]Evening colic
24627	O/E - abd. pain - umbilical
24661	Generalised abdominal pain
28285	[D]Gas pain (abdominal)
29352	Abdominal wall pain
31062	[D]Other specified abdominal pain
50590	O/E - abdominal rigidity
62927	O/E - rebound - umbilical
62933	O/E - guarding - umbilical
70357	[D]Tympanites (abdominal)
73235	O/E - abdominal rigidity NOS

Table S2 Pre-specified cancer and non-cancer diagnoses sought in the year after newly recorded abdominal pain

Condition		Investigation		
		Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
Non-cancer	<i>Abscess, liver*</i>	Yes		Liver U/S, CT abdomen/pelvis
	<i>Appendicitis*</i>	Yes		Not usual in primary care
	<i>Cholangitis*</i>	Yes, and may be diagnostic for autoimmune causes		Not usual in primary care
	Cholecystitis	Yes		U/S, rarely CT abdomen
	Coeliac disease	Yes (plus serological tests)	Yes, with jejunal biopsy	
	Colitis (micro)		Colonoscopy with biopsy	
	Ovarian cyst	Yes; pregnancy tests and Ca125 to exclude cancer		U/S, often trans-vaginal

Condition	Investigation		
	Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
Diverticulitis/ diverticulosis	Yes	Colonoscopy	CT abdomen/pelvis
Endometriosis			U/S, often trans-vaginal, CT, MRI pelvis.
Fibroids, uterine			U/S, hysteroscopy, MRI pelvis
Gallstone	Yes		U/S, rarely CT abdomen
Upper GI conditions: Gastro-oesophageal reflux disease, hiatus hernia, gastritis, oesophagitis, gastric/duodenal ulcer		Gastroscopy	
Gastroenteritis	Stool microscopy and culture		

Condition	Investigation		
	Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
Hepatitis	Yes (plus serological tests)		U/S (including FibroScan® to measure fibrosis and steatosis)
Inflammatory bowel disease	Yes, faecal calprotectin	Colonoscopy	
Irritable bowel syndrome	Yes	No, though colonoscopy often performed to exclude other disease	
<i>Ischaemic bowel*</i>			Not usual in primary care
Systemic Lupus Erythematosus	Yes, and often diagnostic		
Malabsorption	Yes	No, though colonoscopy	Not usual in primary care

Condition	Investigation		
	Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
		often performed to exclude other disease	
<i>Obstruction*</i>	Yes		Not usual in primary care
<i>Pancreatitis*</i>	Yes		Not usual in primary care
<i>Peritonitis*</i>	Yes		Not usual in primary care
Pelvic inflammatory disease	Yes		Transvaginal U/S, CT pelvis, pelvic MRI
Porphyria	Yes		
Prostatitis	Yes		
<i>Pyelonephritis*</i>	Yes		U/S
Stones, bladder	Yes		U/S, plain X-ray, or CT

Condition		Investigation		
		Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
	Stones, kidney	Yes		U/S, plain X-ray, or CT
	Urinary tract infection	Yes		
	Vasculitis	Yes		Not usual in primary care
	<i>Volvulus*</i>	Yes		Abdominal X-ray, CT abdomen contrast, barium enema
Cancer	Bladder	Yes		Cystoscopy, CT abdomen
	Colon or rectum	Yes (plus FIT test)	Colonoscopy	CT abdomen
	Kidney	Yes		CT abdomen, U/S abdomen
	Liver	Yes		CT abdomen

Condition	Investigation		
	Laboratory tests of: Blood urine or stool Swabs for infection	Endoscopy	Imaging
Oesophagus	Yes	Upper GI endoscopy	CT thorax and abdomen
Ovary	Yes (plus CA125)		CT pelvis
Pancreas	Yes		CT pancreas, U/S abdomen
Stomach	Yes	Upper GI endoscopy	CT abdomen/pelvis
Uterine	Yes		Transvaginal U/S, CT pelvis

Notes. Tests performed in secondary care under specialist care have been omitted. Tests sometimes available to primary care are included, including those performed in secondary care but with the primary care clinician retaining clinical responsibility. **Boldfaced** tests are diagnostic of the condition, though in some cases additional tests will follow to add detail to the diagnosis.

**Italics* indicates an acute condition. Abbreviations: CA125, cancer antigen 125; CT, computerised tomography; FIT, faecal immunochemical test; GI, gastrointestinal; MRI, magnetic resonance imaging; U/S, ultrasound.

Table S3 Cumulative 1-year incidence (95%CI) for each diagnosis, by age group and sex. Ca, cancer; IBD, inflammatory bowel disease; IBS, irritable bowel syndrome; PID, pelvic inflammatory disease; Upper GI problems (gastro-oesophageal reflux disease, hiatus hernia, gastritis/oesophagitis, gastric/duodenal ulcer); UTI, urinary tract infection

Men, 40-59 years						
Diagnosis	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
Upper GI problems	1,401	4.86	4.62	5.12	28,800	1,144
Diverticulitis/osis	671	2.26	2.09	2.43	29,744	200
IBS	626	2.11	1.95	2.28	29,634	310
Gallstone	424	1.42	1.29	1.56	29,837	107
UTI	324	1.10	0.98	1.22	29,575	369
Gastroenteritis	277	0.93	0.83	1.05	29,673	271
Prostatitis	235	0.79	0.69	0.90	29,663	281
Stones, kidney	213	0.71	0.62	0.82	29,854	90
Pancreatitis	151	0.51	0.43	0.59	29,861	83
Cholecystitis	140	0.47	0.39	0.55	29,883	61
IBD	121	0.41	0.34	0.48	29,838	106
Appendicitis	119	0.40	0.33	0.48	29,906	38
Colorectal Ca	96	0.32	0.26	0.39	29,944	96
Obstruction	52	0.17	0.13	0.23	29,923	21
Pancreatic Ca	24	0.08	0.05	0.12	29,944	24
Malabsorption	23	0.08	0.05	0.12	29,924	20
Coeliac disease	21	0.07	0.04	0.11	29,926	18
Hepatitis	20	0.07	0.04	0.10	29,910	34
Pyelonephritis	18	0.06	0.04	0.10	29,930	14
Kidney Ca	15	0.05	0.03	0.08	29,944	15
Oesophageal Ca	15	0.05	0.03	0.08	29,944	15
Peritonitis	12	0.04	0.02	0.07	29,940	4
Vasculitis	9	0.03	0.01	0.06	29,940	4
Stomach Ca	9	0.03	0.01	0.06	29,944	9
Cholangitis	8	0.03	0.01	0.05	29,937	7
Stones, bladder	7	0.02	0.01	0.05	29,941	3

Liver Ca	7	0.02	0.01	0.05	29,944	7
Bladder Ca	5	0.02	0.01	0.04	29,944	5
Abscess, liver	4	0.01	0.00	0.03	29,941	3
Volvulus	1	0.00	0.00	0.02	29,942	2
Fibroids, uterine	1	0.00	0.00	0.02	29,944	1
Colitis (micro)	0	0.00	0.00	0.01	29,944	0
Cyst on ovary	0	0.00	0.00	0.01	29,944	0
Endometriosis	0	0.00	0.00	0.01	29,944	0
Ischaemic bowel	0	0.00	0.00	0.01	29,944	0
Lupus	0	0.00	0.00	0.01	29,941	3
PID	0	0.00	0.00	0.01	29,944	0
Porphyria	0	0.00	0.00	0.01	29,943	1
Ovarian Ca	0	0.00	0.00	0.01	29,944	0
Uterine Ca	0	0.00	0.00	0.01	29,944	0

Women, 40-59 years

	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
UTI	1,412	5.07	4.81	5.33	27,875	2,045
Upper GI problems	1,155	4.00	3.77	4.23	28,901	1,019
IBS	867	2.95	2.76	3.15	29,401	519
Gallstone	790	2.66	2.48	2.85	29,708	212
Diverticulitis/osis	444	1.49	1.36	1.64	29,718	202
Fibroids, uterine	387	1.31	1.18	1.44	29,619	301
Cyst on ovary	350	1.18	1.06	1.31	29,744	176
Gastroenteritis	279	0.94	0.84	1.06	29,622	298
Cholecystitis	153	0.51	0.43	0.60	29,852	68
Endometriosis	115	0.39	0.32	0.46	29,845	75
IBD	96	0.32	0.26	0.39	29,843	77
Stones, kidney	78	0.26	0.21	0.33	29,883	37
Pancreatitis	77	0.26	0.20	0.32	29,875	45
Appendicitis	75	0.25	0.20	0.31	29,903	17
Pyelonephritis	61	0.20	0.16	0.26	29,878	42
Obstruction	46	0.15	0.11	0.21	29,904	16
PID	42	0.14	0.10	0.19	29,896	24
Malabsorption	41	0.14	0.10	0.19	29,891	29
Colorectal Ca	41	0.14	0.10	0.19	29,920	41
Coeliac disease	34	0.11	0.08	0.16	29,892	28
Ovarian Ca	29	0.10	0.06	0.14	29,920	29
Pancreatic Ca	15	0.05	0.03	0.08	29,920	15
Hepatitis	12	0.04	0.02	0.07	29,913	7
Cholangitis	11	0.04	0.02	0.07	29,913	7
Volvulus	11	0.04	0.02	0.07	29,918	2
Lupus	8	0.03	0.01	0.05	29,913	7
Uterine Ca	8	0.03	0.01	0.05	29,920	8
Vasculitis	7	0.02	0.01	0.05	29,916	4
Peritonitis	6	0.02	0.01	0.04	29,918	2
Colitis (micro)	4	0.01	0.00	0.03	29,919	1

Oesophgeal Ca	3	0.01	0.00	0.03	29,920	3
Abscess, liver	2	0.01	0.00	0.02	29,920	2
Bladder Ca	2	0.01	0.00	0.02	29,920	2
Kidney Ca	2	0.01	0.00	0.02	29,920	2
Porphyria	1	0.00	0.00	0.02	29,920	1
Stones, bladder	1	0.00	0.00	0.02	29,920	1
Stomach Ca	1	0.00	0.00	0.02	29,920	1
Ischaemic bowel	0	0.00	0.00	0.01	29,920	0
Prostatitis	0	0.00	0.00	0.01	29,920	0
Liver Ca	0	0.00	0.00	0.01	29,920	0

Men, 60-69 years

	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
Upper GI problems	808	5.83	5.44	6.23	13,867	639
Diverticulitis/osis	602	4.22	3.90	4.56	14,265	241
Gallstone	336	2.33	2.09	2.59	14,436	70
Prostatitis	316	2.24	2.00	2.50	14,115	391
UTI	233	1.64	1.44	1.86	14,193	313
IBS	194	1.35	1.17	1.55	14,371	135
Gastroenteritis	119	0.83	0.69	0.99	14,357	149
Colorectal Ca	120	0.83	0.69	0.99	14,506	120
Cholecystitis	114	0.79	0.65	0.95	14,467	39
Stones, kidney	100	0.69	0.56	0.84	14,467	39
Pancreatitis	89	0.62	0.49	0.76	14,460	46
Obstruction	45	0.31	0.23	0.42	14,488	18
Pancreatic Ca	45	0.31	0.23	0.41	14,506	45
IBD	44	0.30	0.22	0.41	14,459	47
Appendicitis	38	0.26	0.19	0.36	14,498	8
Oesophageal Ca	27	0.19	0.12	0.27	14,506	27
Liver Ca	14	0.10	0.05	0.16	14,506	14
Pyelonephritis	12	0.08	0.04	0.14	14,496	10
Stomach Ca	12	0.08	0.04	0.14	14,506	12
Bladder Ca	11	0.08	0.04	0.14	14,506	11
Kidney Ca	11	0.08	0.04	0.14	14,506	11
Hepatitis	9	0.06	0.03	0.12	14,496	10
Malabsorption	7	0.05	0.02	0.10	14,494	12
Coeliac disease	7	0.05	0.02	0.10	14,495	11
Cholangitis	7	0.05	0.02	0.10	14,504	2
Peritonitis	5	0.03	0.01	0.08	14,503	3
Stones, bladder	5	0.03	0.01	0.08	14,503	3
Volvulus	5	0.03	0.01	0.08	14,503	3
Vasculitis	4	0.03	0.01	0.07	14,499	7
Abscess, liver	4	0.03	0.01	0.07	14,506	4

Ischaemic bowel	2	0.01	0.00	0.05	14,505	1
Colitis (micro)	1	0.01	0.00	0.04	14,506	1
Lupus	1	0.01	0.00	0.04	14,506	1
Cyst on ovary	0	0.00	0.00	0.03	14,506	0
Endometriosis	0	0.00	0.00	0.03	14,506	0
Fibroids, uterine	0	0.00	0.00	0.03	14,506	0
PID	0	0.00	0.00	0.03	14,506	0
Porphyria	0	0.00	0.00	0.03	14,506	0
Ovarian Ca	0	0.00	0.00	0.03	14,506	0
Uterine Ca	0	0.00	0.00	0.03	14,506	0

Women, 60-69 years

	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
UTI	856	6.27	5.86	6.68	13,663	1,292
Upper GI problems	768	5.42	5.06	5.81	14,159	796
Diverticulitis/osis	697	4.76	4.43	5.12	14,628	327
Gallstone	467	3.15	2.88	3.44	14,823	132
IBS	355	2.41	2.17	2.68	14,701	254
Gastroenteritis	142	0.96	0.81	1.13	14,795	160
Cholecystitis	101	0.68	0.55	0.82	14,902	53
Colorectal Ca	72	0.48	0.38	0.61	14,955	72
Cyst on ovary	68	0.46	0.35	0.58	14,924	31
Pancreatitis	59	0.40	0.30	0.51	14,927	28
Fibroids, uterine	41	0.27	0.20	0.37	14,938	17
Appendicitis	37	0.25	0.17	0.34	14,953	2
Pancreatic Ca	35	0.23	0.16	0.33	14,955	35
Stones, kidney	33	0.22	0.15	0.31	14,935	20
Ovarian Ca	32	0.21	0.15	0.30	14,955	32
IBD	29	0.19	0.13	0.28	14,921	34
Obstruction	26	0.17	0.11	0.25	14,938	17
Pyelonephritis	17	0.11	0.07	0.18	14,933	22
Malabsorption	17	0.11	0.07	0.18	14,944	11
Coeliac disease	16	0.11	0.06	0.17	14,944	11
Kidney Ca	10	0.07	0.03	0.12	14,955	10
Vasculitis	9	0.06	0.03	0.11	14,949	6
Hepatitis	8	0.05	0.02	0.11	14,951	4
Peritonitis	7	0.05	0.02	0.10	14,952	3
Cholangitis	6	0.04	0.01	0.09	14,953	2
Oesophageal Ca	6	0.04	0.01	0.09	14,955	6
Bladder Ca	5	0.03	0.01	0.08	14,955	5
Stomach Ca	5	0.03	0.01	0.08	14,955	5
Uterine Ca	5	0.03	0.01	0.08	14,955	5
Volvulus	4	0.03	0.01	0.07	14,955	4

Liver Ca	4	0.03	0.01	0.07	14,955	4
Lupus	2	0.01	0.00	0.05	14,947	8
Ischaemic bowel	2	0.01	0.00	0.05	14,955	2
Colitis (micro)	1	0.01	0.00	0.04	14,954	1
Abscess, liver	1	0.01	0.00	0.04	14,955	1
Stones, bladder	1	0.01	0.00	0.04	14,955	1
Endometriosis	0	0.00	0.00	0.02	14,952	3
PID	0	0.00	0.00	0.02	14,952	3
Porphyria	0	0.00	0.00	0.02	14,955	0
Prostatitis	0	0.00	0.00	0.02	14,955	0

Men, ≥70 years

	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
Upper GI problems	752	5.85	5.45	6.27	12,855	605
Diverticulitis/osis	551	4.20	3.86	4.55	13,129	331
UTI	425	3.30	3.00	3.62	12,877	583
Prostatitis	317	2.44	2.18	2.72	12,978	482
Gallstone	320	2.39	2.14	2.67	13,377	83
Colorectal Ca	190	1.41	1.22	1.63	13,460	190
Cholecystitis	189	1.41	1.22	1.62	13,403	57
Gastroenteritis	114	0.86	0.71	1.03	13,328	132
Pancreatitis	87	0.65	0.52	0.80	13,417	43
IBS	86	0.64	0.52	0.79	13,365	95
Obstruction	82	0.61	0.49	0.76	13,444	16
Stones, kidney	70	0.52	0.41	0.66	13,430	30
Pancreatic Ca	53	0.39	0.30	0.51	13,460	53
IBD	30	0.22	0.15	0.32	13,434	26
Bladder Ca	24	0.18	0.11	0.27	13,460	24
Stomach Ca	24	0.18	0.11	0.27	13,460	24
Appendicitis	21	0.16	0.10	0.24	13,455	5
Cholangitis	19	0.14	0.09	0.22	13,442	18
Volvulus	19	0.14	0.09	0.22	13,452	8
Kidney Ca	19	0.14	0.09	0.22	13,460	19
Oesophageal Ca	17	0.13	0.07	0.20	13,460	17
Stones, bladder	12	0.09	0.05	0.16	13,449	11
Peritonitis	12	0.09	0.05	0.16	13,456	4
Liver Ca	12	0.09	0.05	0.16	13,460	12
Pyelonephritis	11	0.08	0.04	0.15	13,453	7
Malabsorption	9	0.07	0.03	0.13	13,456	4
Coeliac disease	8	0.06	0.03	0.12	13,457	3
Hepatitis	5	0.04	0.01	0.09	13,457	3
Abscess, liver	2	0.01	0.00	0.05	13,458	2
Vasculitis	1	0.01	0.00	0.04	13,450	10

Colitis (micro)	1	0.01	0.00	0.04	13,460	1
Cyst on ovary	0	0.00	0.00	0.03	13,460	0
Endometriosis	0	0.00	0.00	0.03	13,460	0
Fibroids, uterine	0	0.00	0.00	0.03	13,460	0
Ischaemic bowel	0	0.00	0.00	0.03	13,460	0
Lupus	0	0.00	0.00	0.03	13,457	3
PID	0	0.00	0.00	0.03	13,460	0
Porphyria	0	0.00	0.00	0.03	13,460	0
Ovarian Ca	0	0.00	0.00	0.03	13,460	0
Uterine Ca	0	0.00	0.00	0.03	13,460	0

Women, ≥70 years

	Diagnosed (n)	1-yr cum inc	lower 95%CI	upper 95%CI	At risk (N)	Previous diagnosis (n)
UTI	1,608	7.99	7.62	8.38	20,114	2,894
Diverticulitis/osis	1,351	6.08	5.77	6.40	22,218	790
Upper GI problems	1,135	5.19	4.90	5.49	21,861	1,147
Gallstone	560	2.45	2.26	2.66	22,814	194
IBS	299	1.32	1.17	1.47	22,717	291
Gastroenteritis	247	1.09	0.96	1.23	22,687	321
Cholecystitis	180	0.78	0.67	0.91	22,934	74
Colorectal Ca	179	0.78	0.67	0.90	23,008	179
Obstruction	93	0.40	0.33	0.50	22,968	40
Ovarian Ca	89	0.39	0.31	0.48	23,008	89
Pancreatitis	85	0.37	0.30	0.46	22,961	47
Cyst on ovary	70	0.30	0.24	0.38	22,979	29
Pancreatic Ca	63	0.27	0.21	0.35	23,008	63
IBD	45	0.20	0.14	0.26	22,974	34
Stones, kidney	34	0.15	0.10	0.21	22,982	26
Fibroids, uterine	32	0.14	0.10	0.20	22,995	13
Cholangitis	29	0.13	0.08	0.18	22,996	12
Appendicitis	28	0.12	0.08	0.18	23,002	6
Pyelonephritis	25	0.11	0.07	0.16	22,988	20
Bladder Ca	25	0.11	0.07	0.16	23,008	25
Uterine Ca	22	0.10	0.06	0.14	23,008	22
Stomach Ca	20	0.09	0.05	0.13	23,008	20
Peritonitis	16	0.07	0.04	0.11	23,006	2
Oesophageal Ca	16	0.07	0.04	0.11	23,008	16
Malabsorption	14	0.06	0.03	0.10	22,991	17
Coeliac disease	14	0.06	0.03	0.10	22,992	16
Volvulus	14	0.06	0.03	0.10	22,999	9
Kidney Ca	9	0.04	0.02	0.07	23,008	9
Liver Ca	7	0.03	0.01	0.06	23,008	7
Vasculitis	5	0.02	0.01	0.05	22,995	13

Hepatitis	3	0.01	0.00	0.04	23,002	6
Lupus	3	0.01	0.00	0.04	23,003	5
Colitis (micro)	3	0.01	0.00	0.04	23,007	1
Ischaemic bowel	2	0.01	0.00	0.03	23,008	2
Abscess, liver	1	0.00	0.00	0.02	23,007	1
Endometriosis	0	0.00	0.00	0.02	23,008	0
PID	0	0.00	0.00	0.02	23,008	0
Porphyria	0	0.00	0.00	0.02	23,008	0
Prostatitis	0	0.00	0.00	0.02	23,008	0
Stones, bladder	0	0.00	0.00	0.02	23,007	1