

RIZIV/INAMI convention Complex Surgery Pancreas and peri-ampullary region

Global report
Period July 2019 - June 2025
Belgian Cancer Registry Team
Version 1.0 - 08/04/2026

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1. Introduction and patient selection

1.1. Project background

This report includes data that have been delivered by recognised medical centres to the Belgian Cancer Registry for the six years of the RIZIV/INAMI convention regarding the reimbursement of complex surgery for benign, premalignant and malignant conditions of the pancreas and/or periampullary region. All patients considered for complex surgery at a multidisciplinary consult (MC) at an expert centre were included. For the patients for whom it was decided not to perform complex surgery only the descriptives were analysed. There are 3 major types of surgical indications: malignant tumours, benign tumours and non-tumoural conditions. The report is subdivided in 2 chapters: tumoural and non-tumoural pathology.

For details on the calculation of the indicators, see document 'Complex Surgery - Pancreas Reading guide v2.0 (14/02/2020)'. After the sixth convention year the indicator 'completeness of registration' will include all the data of the six convention years, including delayed/adjusted data deliveries.

1.2. Data selection criteria

All data from registrations by recognised expert centres sent to the Belgian Cancer Registry were included if:

- In case of surgery: date of surgery 1/07/2019 - 30/06/2025.
- In case of no surgery: date of MC 1/07/2019 - 30/06/2025.

Remarks:

- Foreign patients were not included in the data selection criteria.
- In case that the same patient was registered by two different hospitals, the registration was assigned to the centre where the surgery was performed.
- In case that the same patient was registered by two different hospitals without any surgery, the registration was assigned to the centre where the first MC took place.
- Registrations sent by collaborating hospitals were counted among those of the main expert centre within their collaboration.

2. General overview of registered patients

Table 1. Number of patients discussed on a multidisciplinary expert consult (MC expert), overview.

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Patient group	N	%	N	%	N	%	N	%	N	%	N	%
<i>Patients discussed on a MC expert</i>	1,937	-	2,213	-	2,370	-	2,389	-	2,600	-	2,636	-
<i>Patients with surgery</i>	787	40.6 a	928	41.9 a	920	38.8 a	919	38.5 a	1,013	39.0 a	978	37.1 a
<i>Pathology type</i>												
Malignant tumour	598	76.0 b	721	77.7 b	739	80.3 b	716	77.9 b	801	79.1 b	785	80.3 b
Benign tumour	126	16.0 b	135	14.5 b	112	12.2 b	118	12.8 b	112	11.1 b	108	11.0 b
Non-tumoural	63	8.0 b	72	7.8 b	69	7.5 b	85	9.2 b	100	9.9 b	85	8.7 b
<i>Type of surgery</i>												
242830-242841: Pancreaticoduodenectomy	563	71.5 b	601	64.8 b	597	64.9 b	597	65.0 b	621	61.3 b	623	63.7 b
Pancreaticoduodenectomy	512	90.9 c	548	91.2 c	548	91.8 c	533	89.3 c	551	88.7 c	552	88.6 c
Total Pancreatectomy	51	9.1 c	53	8.8 c	49	8.2 c	64	10.7 c	70	11.3 c	70	11.2 c

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Patient group	N	%	N	%	N	%	N	%	N	%	N	%
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	63	8.0 b	104	11.2 b	88	9.6 b	122	13.3 b	91	9.0 b	63	6.4 b
242874-242885: Hemipancreatectomy left	150	19.1 b	208	22.4 b	217	23.6 b	191	20.8 b	285	28.1 b	279	28.5 b
242896-242900: Enucleation of a pancreatic tumour	11	1.4 b	15	1.6 b	18	2.0 b	9	1.0 b	16	1.6 b	13	1.3 b
Expert centers												
S1	85	59.0 a	83	53.9 a	98	57.6 a	90	47.9 a	103	52.6 a	81	52.9 a
S2	36	36.0 a	36	31.3 a	33	25.2 a	41	25.0 a	41	25.8 a	46	25.4 a
S3	21	42.0 a	28	37.8 a	27	23.3 a	20	17.1 a	29	25.7 a	43	29.7 a
S4	135	55.6 a	154	50.3 a	161	48.2 a	154	52.4 a	192	52.2 a	153	42.9 a
S5	37	43.5 a	46	65.7 a	34	44.2 a	34	40.5 a	44	32.6 a	40	46.5 a
S6	65	35.9 a	69	38.1 a	95	39.4 a	100	41.2 a	101	40.9 a	94	42.9 a
S7	70	46.1 a	80	45.5 a	64	39.5 a	79	40.3 a	54	30.5 a	70	35.2 a

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Patient group	N	%	N	%	N	%	N	%	N	%	N	%
S8	45	36.0 a	56	36.8 a	47	29.4 a	58	32.8 a	58	29.9 a	71	34.3 a
S9	87	46.3 a	106	59.6 a	107	58.5 a	111	64.2 a	115	59.6 a	98	43.0 a
S10	35	25.2 a	27	21.8 a	33	33.7 a	36	35.3 a	34	27.6 a	38	33.9 a
S11	30	28.6 a	45	34.6 a	37	38.5 a	40	58.0 a	31	93.9 a	33	45.8 a
S12	44	46.3 a	52	42.3 a	51	38.9 a	45	40.5 a	66	43.4 a	53	36.3 a
S13	30	25.6 a	58	34.3 a	41	26.6 a	31	18.9 a	38	25.0 a	38	25.3 a
S14	39	33.3 a	51	27.1 a	64	26.0 a	54	23.4 a	75	28.5 a	88	31.3 a
S15	28	29.2 a	37	50.7 a	28	39.4 a	26	34.2 a	32	33.7 a	32	32.0 a
Patients without surgery	1,150	59.4 a	1,285	58.1 a	1,450	61.2 a	1,470	61.5 a	1,587	61.0 a	1,658	62.9 a
Pathology type												
Malignant tumour	736	64.0 b	746	58.1 b	808	55.7 b	828	56.3 b	872	54.9 b	968	58.4 b
Benign tumour	256	22.3 b	360	28.0 b	390	26.9 b	414	28.2 b	483	30.4 b	448	27.0 b
Non-tumoural	158	13.7 b	179	13.9 b	252	17.4 b	228	15.5 b	232	14.6 b	242	14.6 b
Expert centers												
S1	59	41.0 a	71	46.1 a	72	42.4 a	98	52.1 a	93	47.4 a	72	47.1 a
S2	64	64.0 a	79	68.7 a	98	74.8 a	123	75.0 a	118	74.2 a	135	74.6 a

Belgium												
Patient group	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	N	%	N	%	N	%	N	%	N	%	N	%
S3	29	58.0 a	46	62.2 a	89	76.7 a	97	82.9 a	84	74.3 a	102	70.3 a
S4	108	44.4 a	152	49.7 a	173	51.8 a	140	47.6 a	176	47.8 a	204	57.1 a
S5	48	56.5 a	24	34.3 a	43	55.8 a	50	59.5 a	91	67.4 a	46	53.5 a
S6	116	64.1 a	112	61.9 a	146	60.6 a	143	58.8 a	146	59.1 a	125	57.1 a
S7	82	53.9 a	96	54.5 a	98	60.5 a	117	59.7 a	123	69.5 a	129	64.8 a
S8	80	64.0 a	96	63.2 a	113	70.6 a	119	67.2 a	136	70.1 a	136	65.7 a
S9	101	53.7 a	72	40.4 a	76	41.5 a	62	35.8 a	78	40.4 a	130	57.0 a
S10	104	74.8 a	97	78.2 a	65	66.3 a	66	64.7 a	89	72.4 a	74	66.1 a
S11	75	71.4 a	85	65.4 a	59	61.5 a	29	42.0 a	2	6.1 a	39	54.2 a
S12	51	53.7 a	71	57.7 a	80	61.1 a	66	59.5 a	86	56.6 a	93	63.7 a
S13	87	74.4 a	111	65.7 a	113	73.4 a	133	81.1 a	114	75.0 a	112	74.7 a
S14	78	66.7 a	137	72.9 a	182	74.0 a	177	76.6 a	188	71.5 a	193	68.7 a
S15	68	70.8 a	36	49.3 a	43	60.6 a	50	65.8 a	63	66.3 a	68	68.0 a

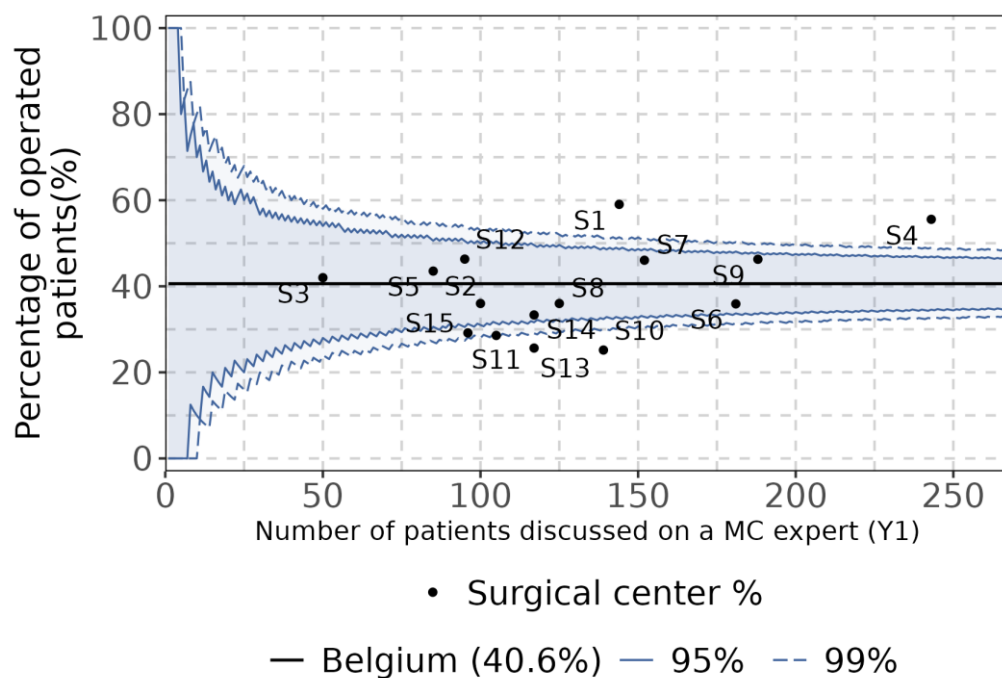
a: percentage relative to the number of patients with MC expert

b: percentage relative to the number of patients with/without surgery

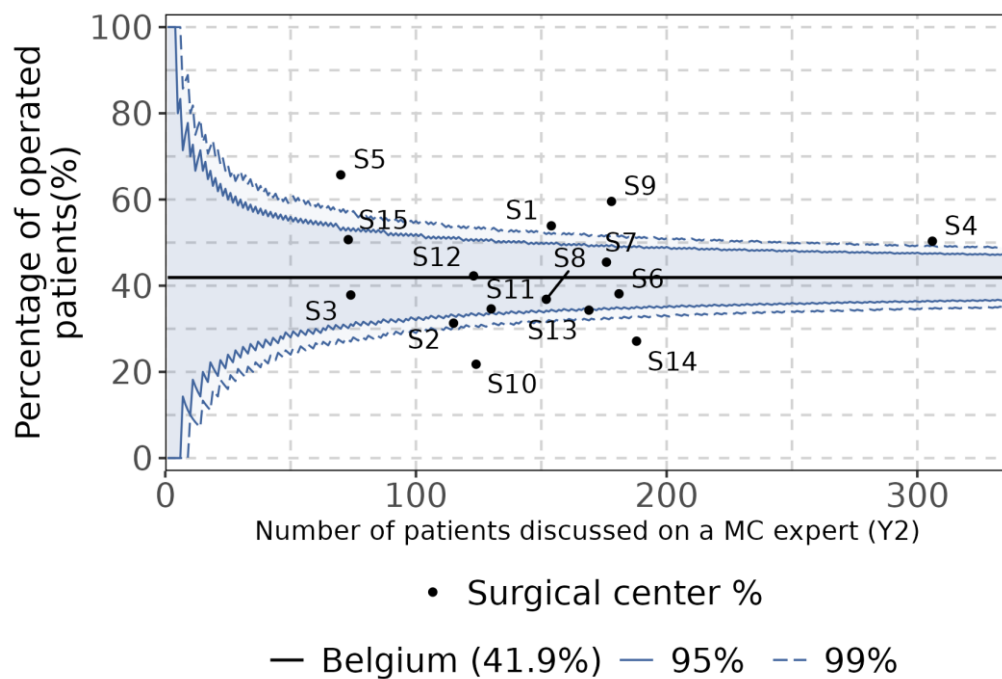
c: percentage relative to the number of patients with 242830-242841 Pancreaticoduodenectomy as type of surgery

Figure 1. Funnel and spaghetti plot of the proportion of patients discussed on a MC expert who were treated with surgery by an individual expert centre, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

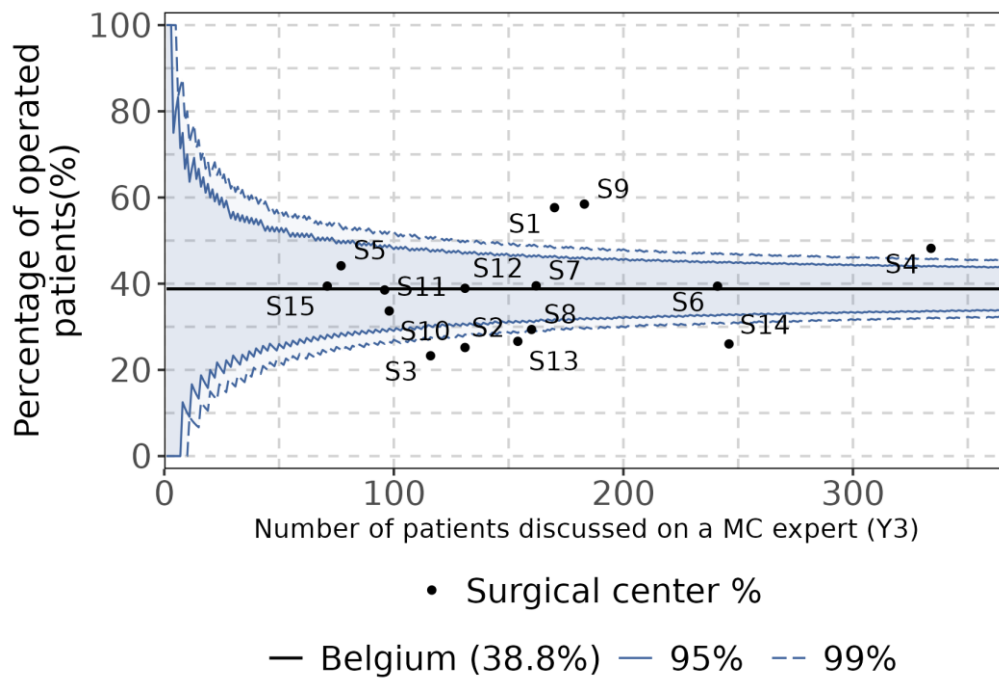
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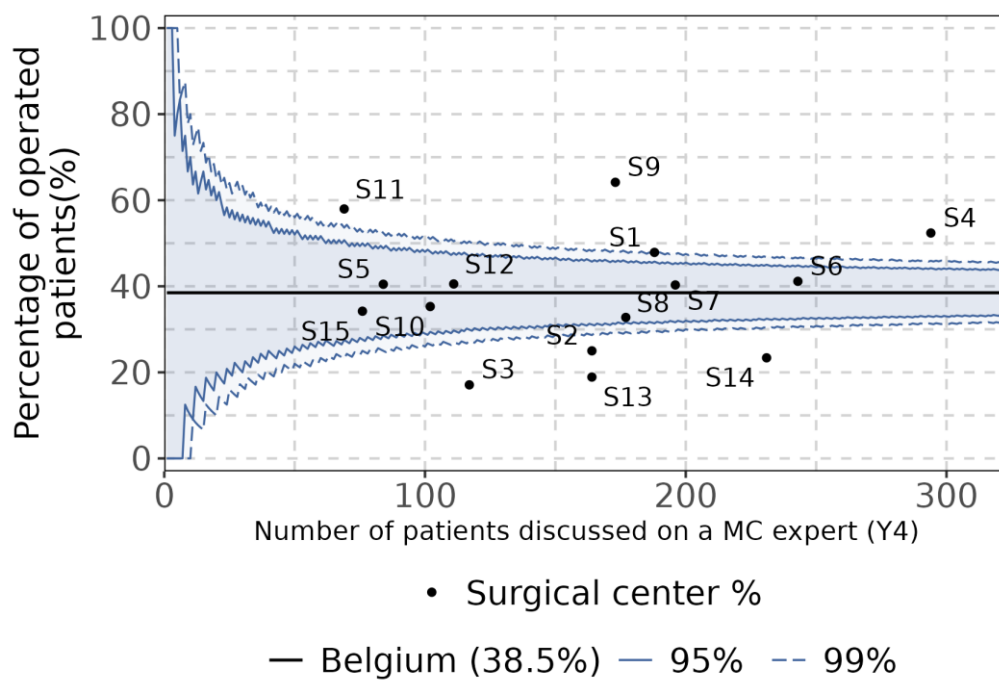
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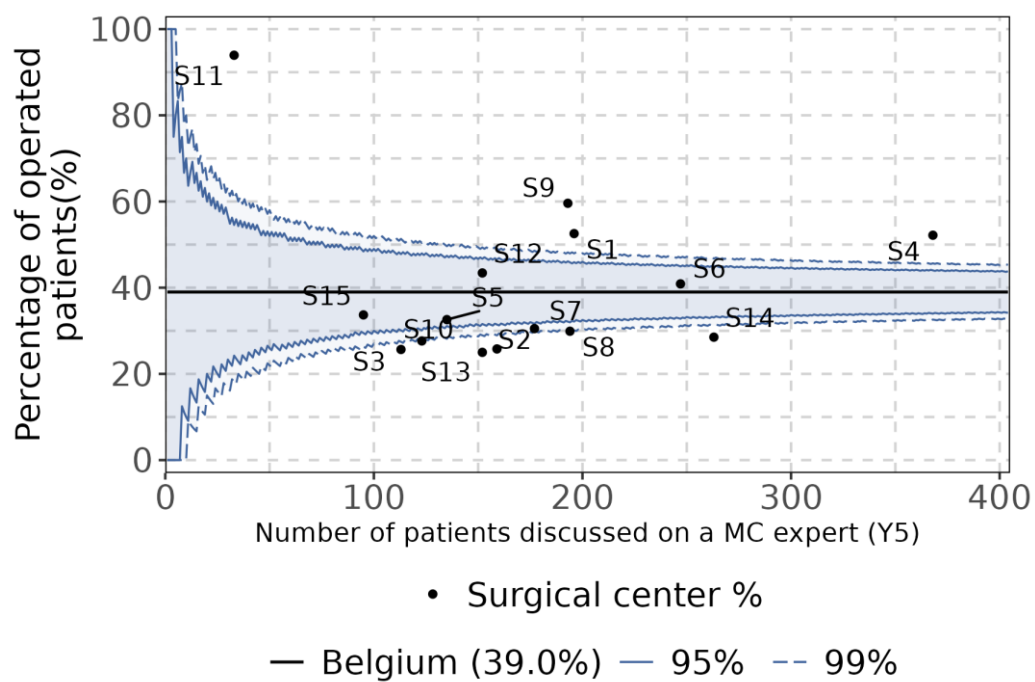
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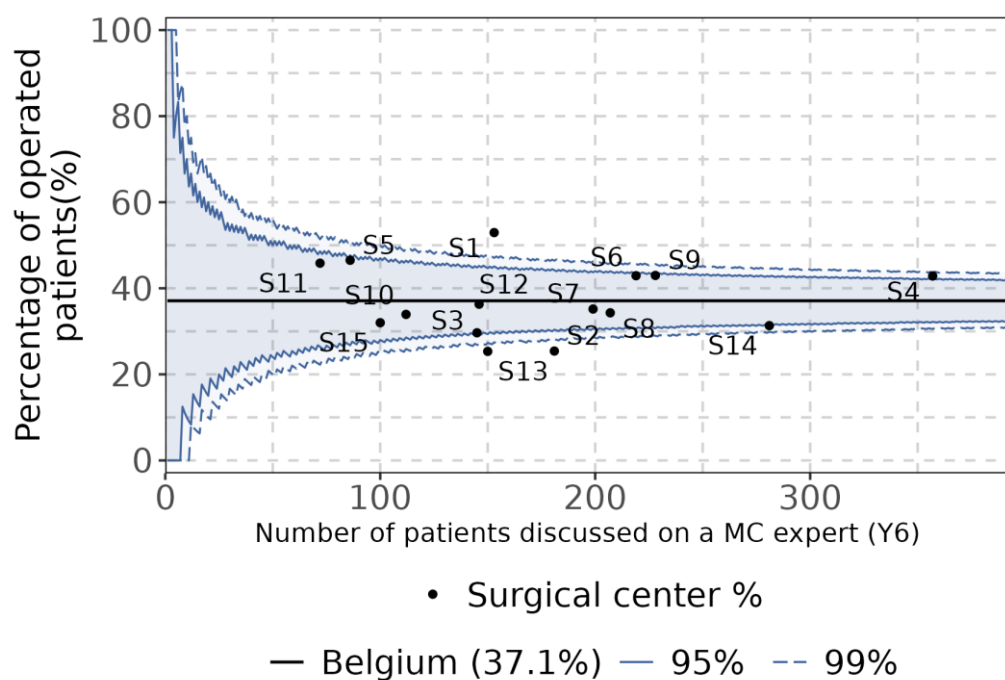
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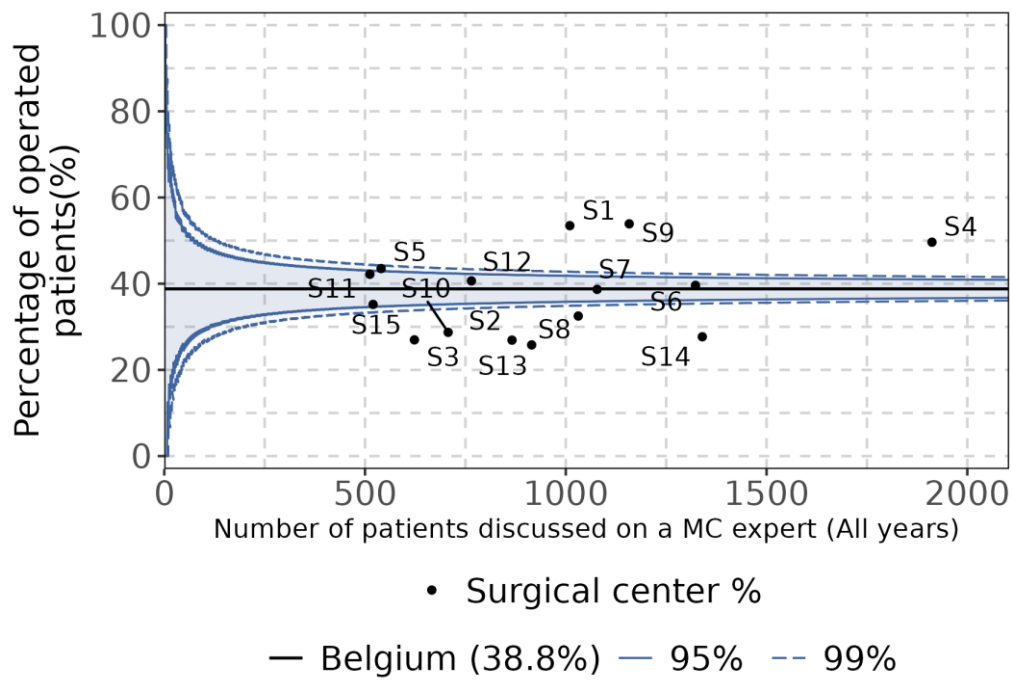
e)



f)



g)



h)

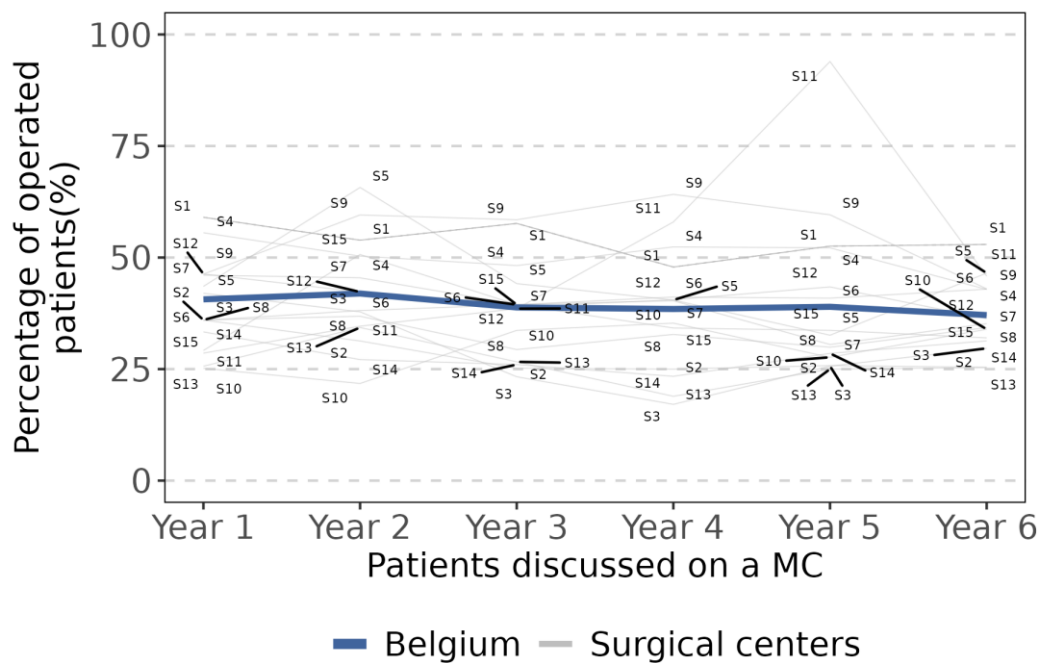
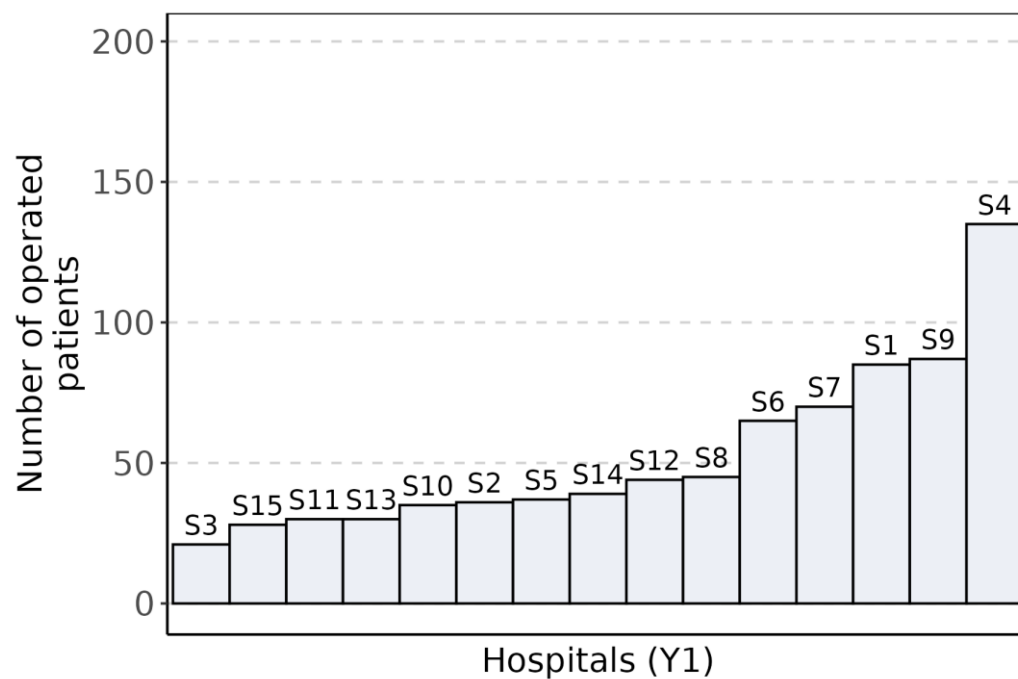
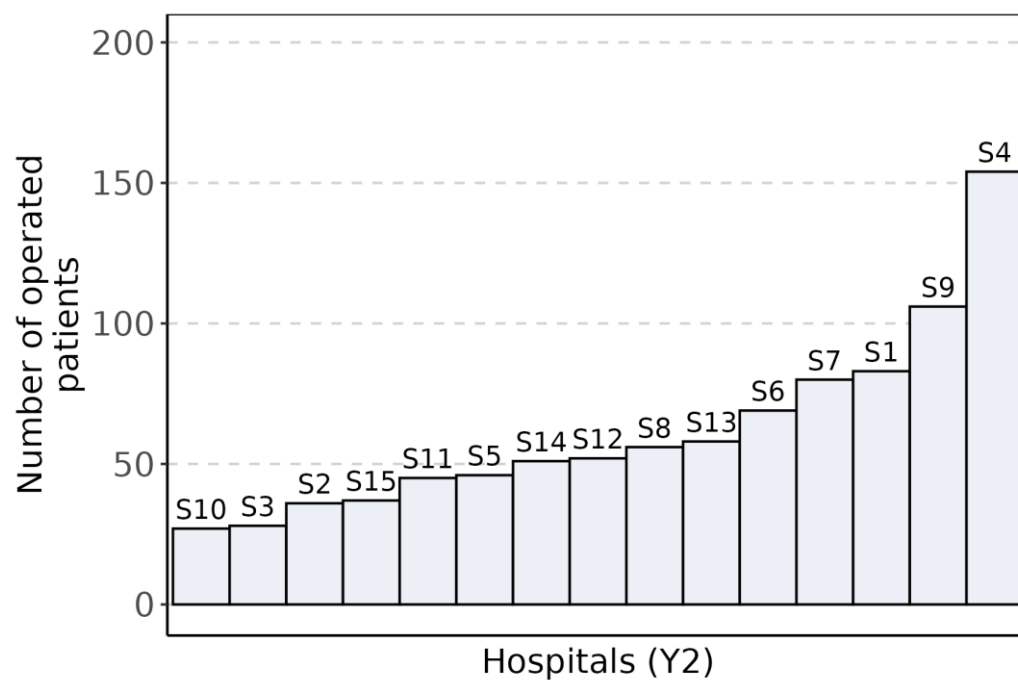


Figure 2. Absolute number of patients discussed on a MC expert that were treated with surgery by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) year 6 and (g) all years combined.

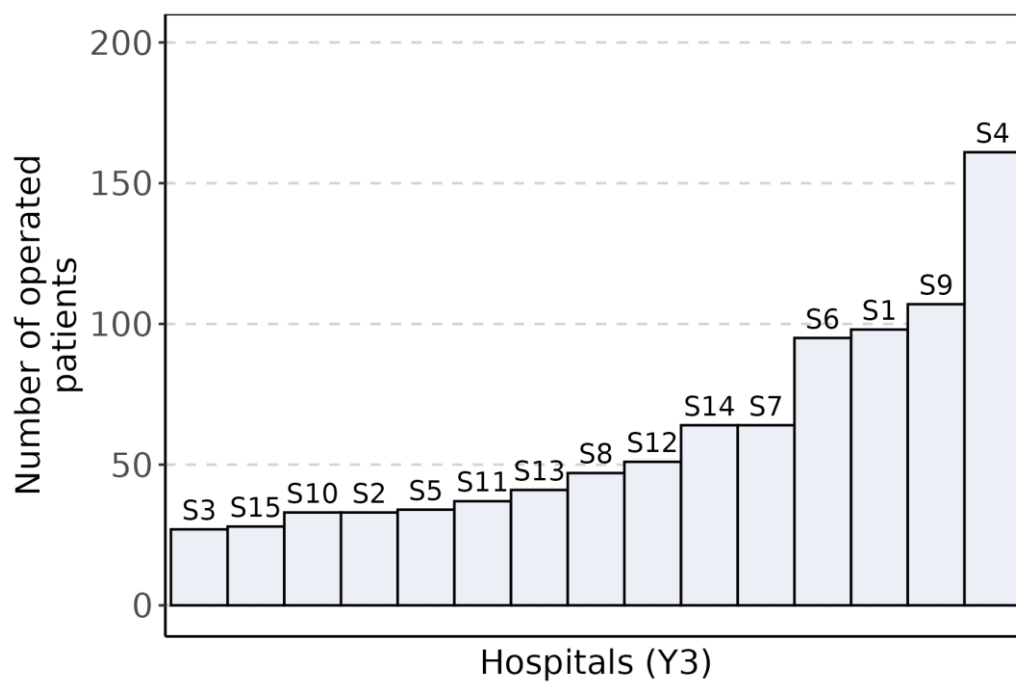
a)



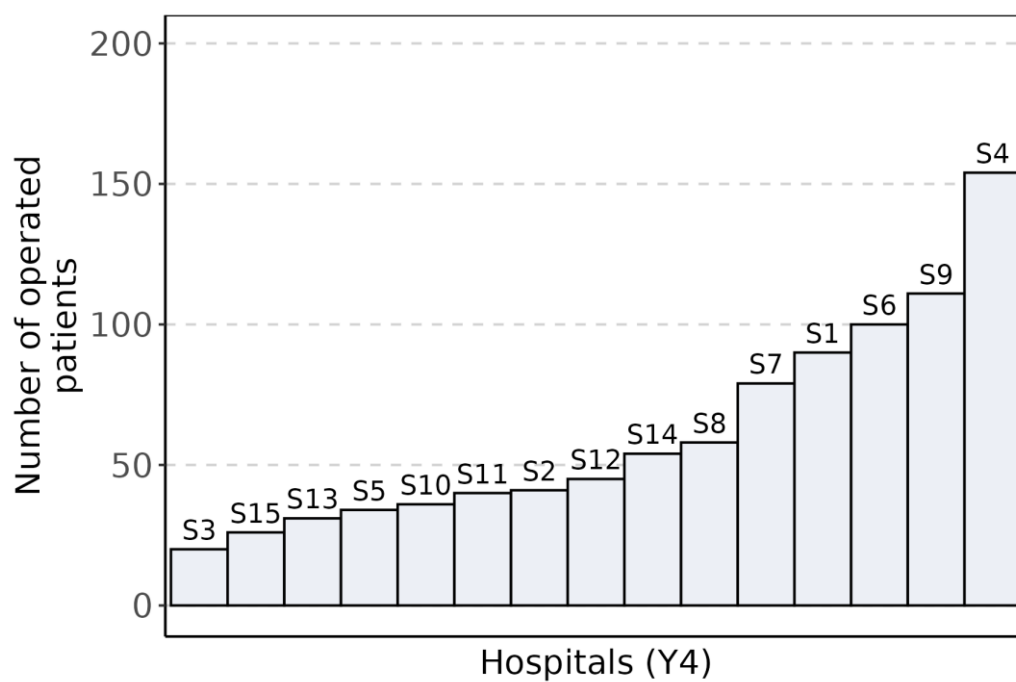
b)



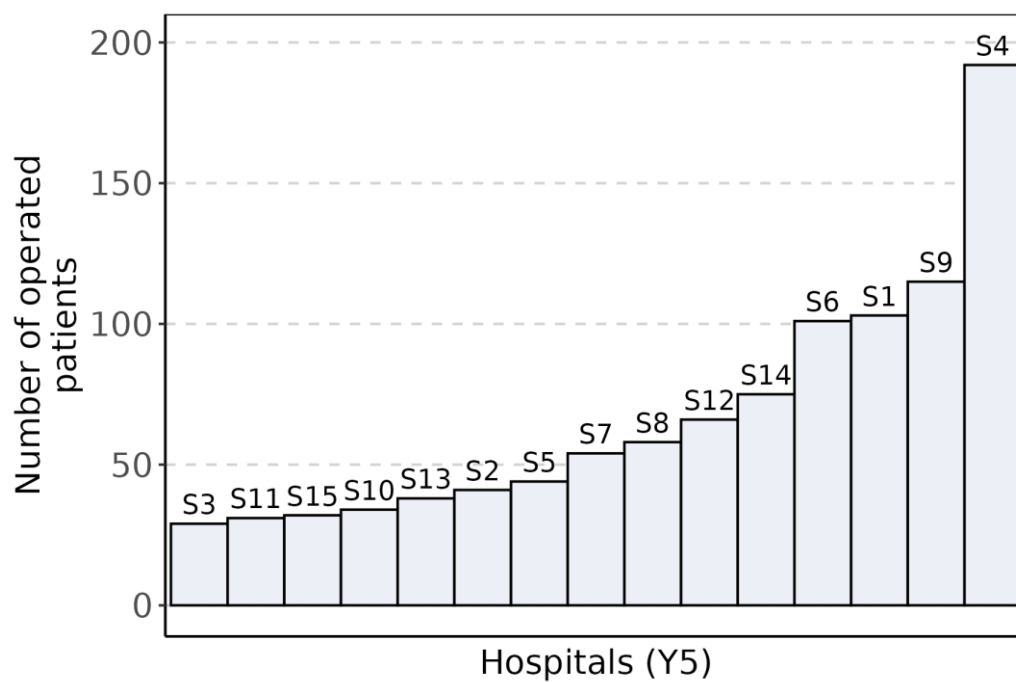
c)



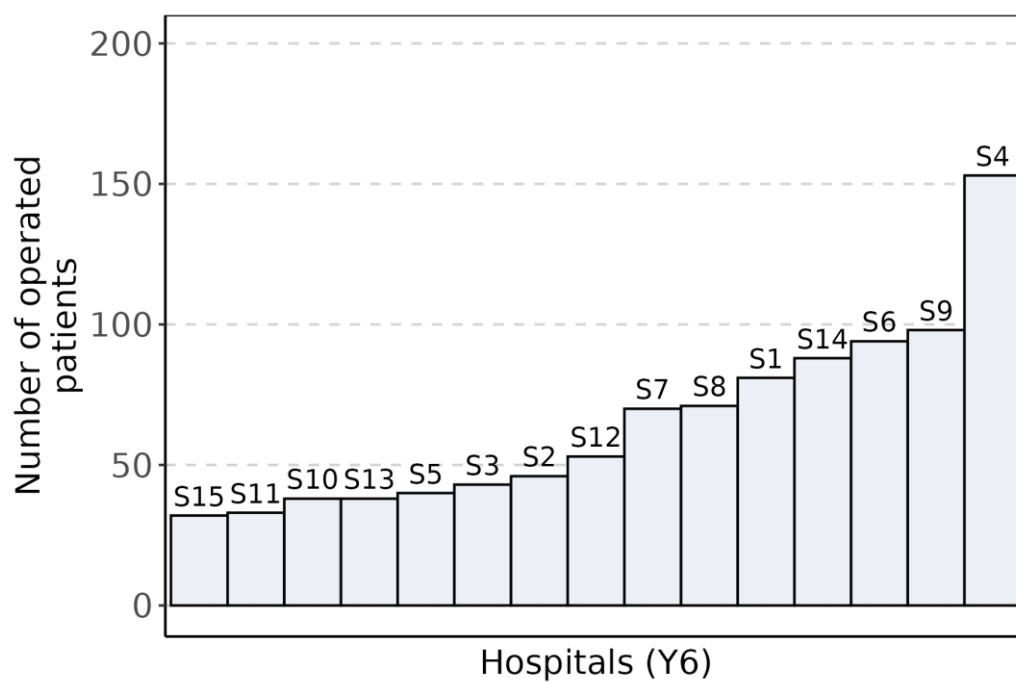
d)



e)



f)



g)

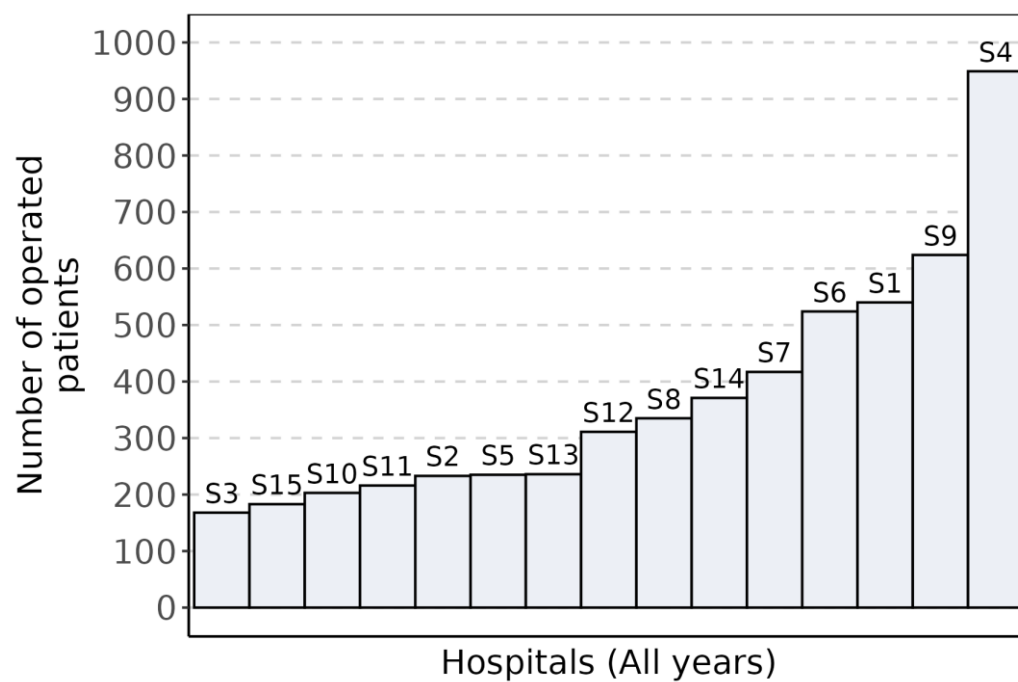
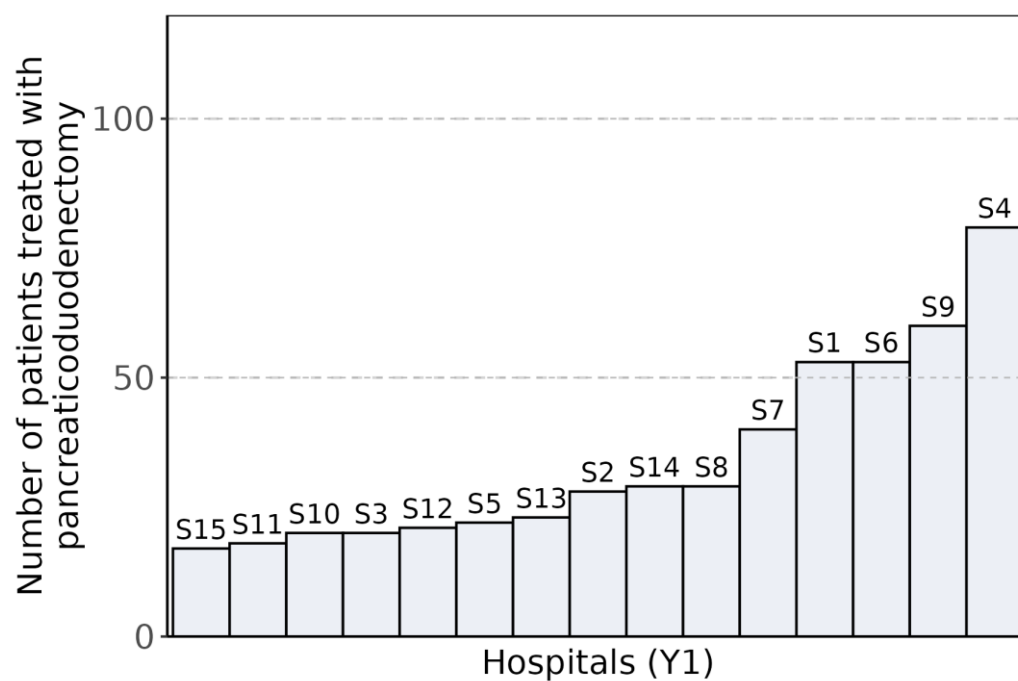
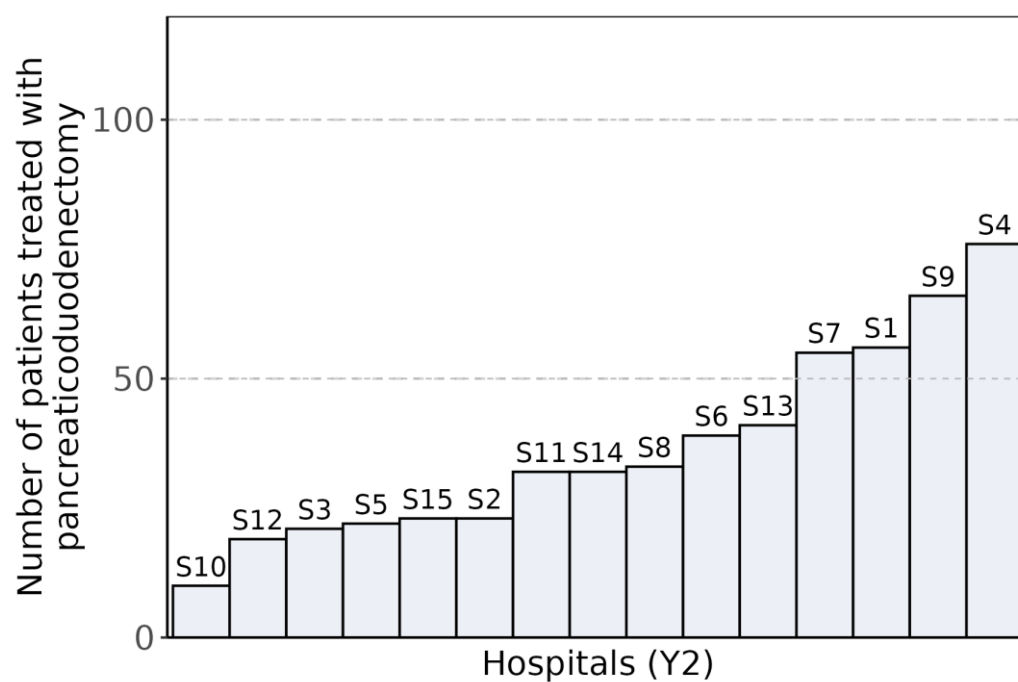


Figure 3. Absolute number of patients discussed on a MC expert that were treated with pancreaticoduodenectomy by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) year 6 and (g) all years combined.

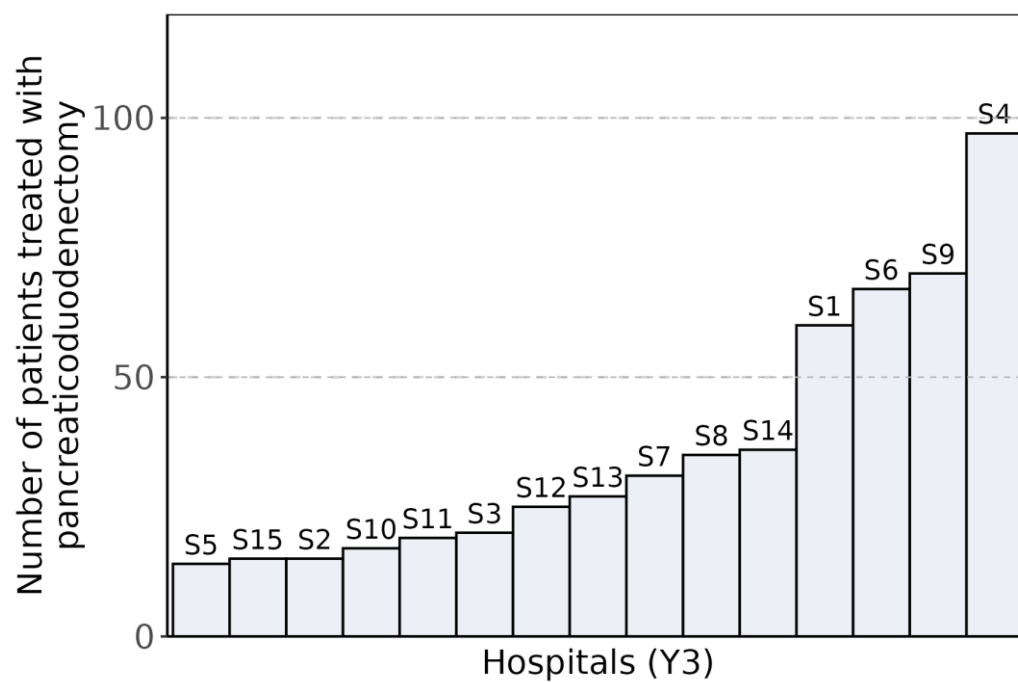
a)



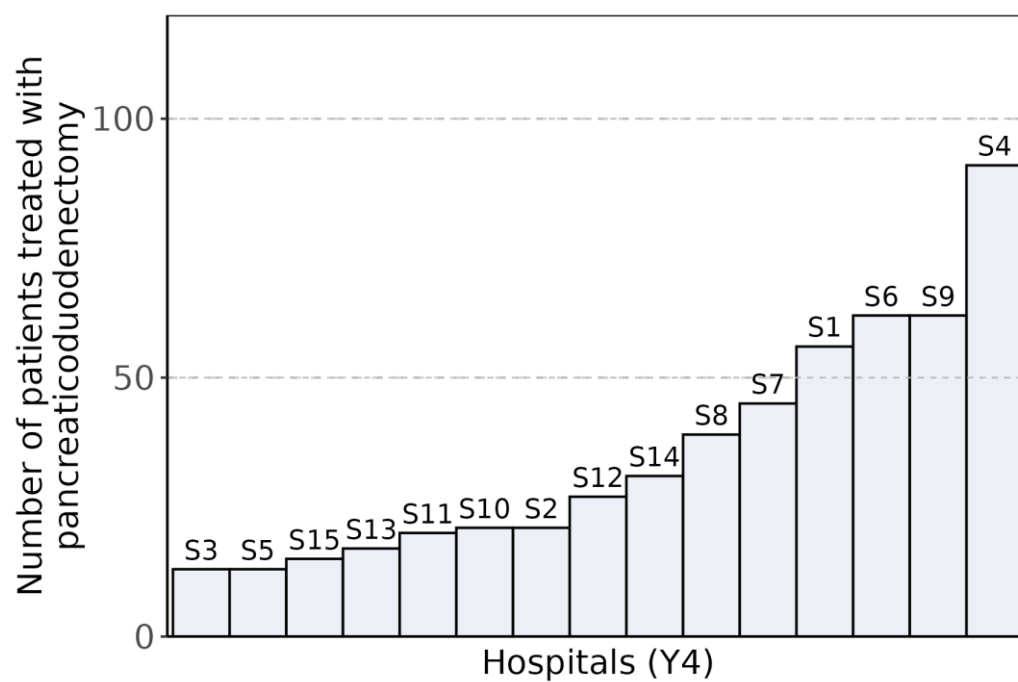
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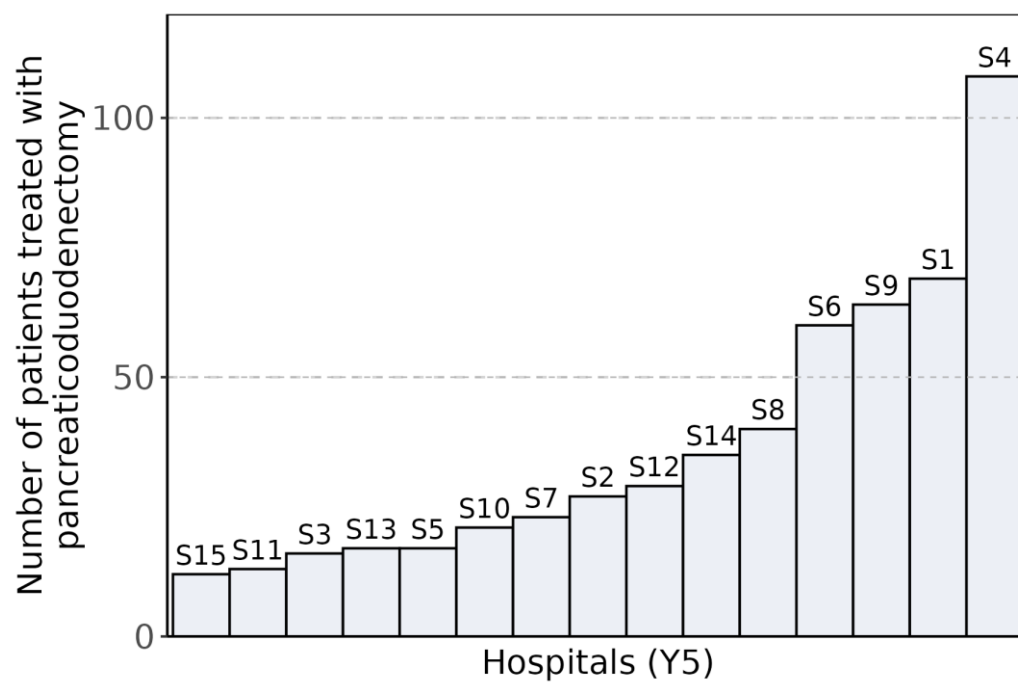
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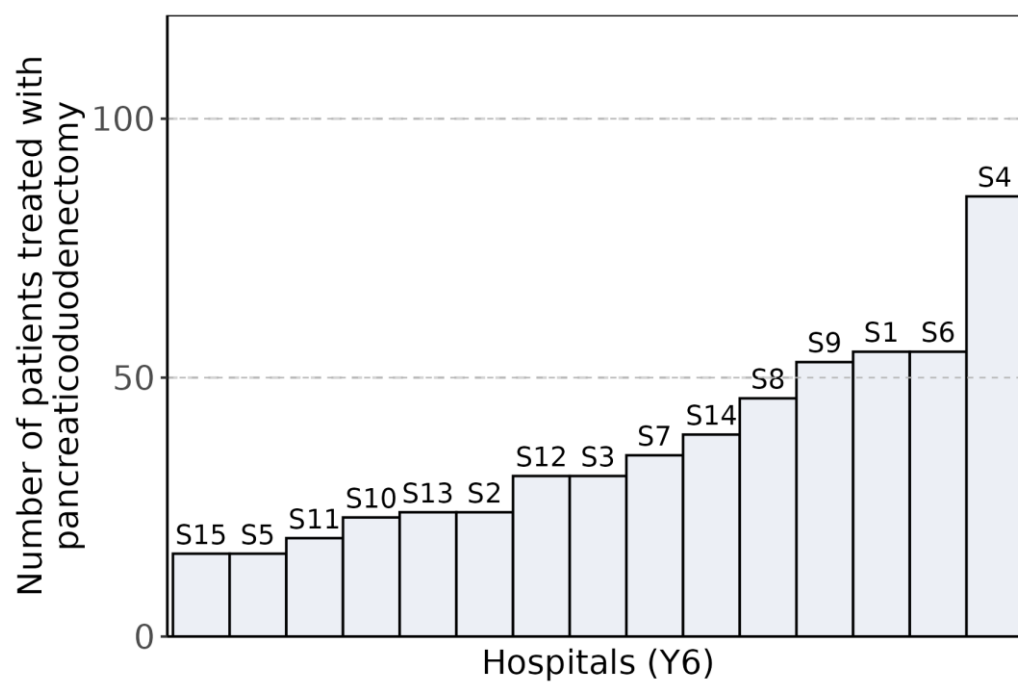
d)



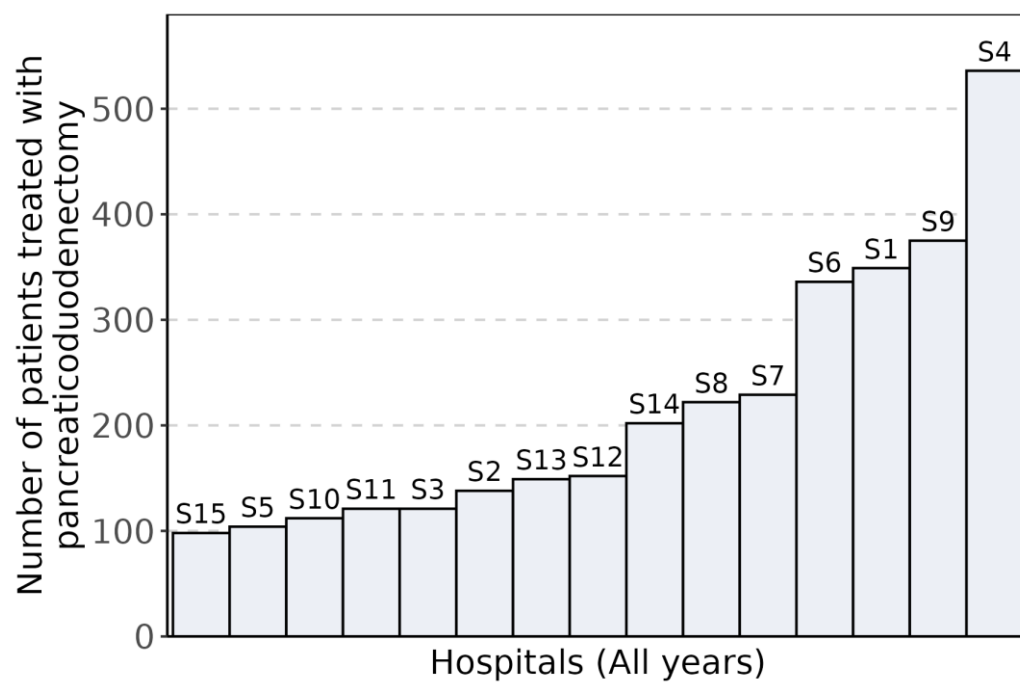
e)



f)



g)



3. Tumoural pathology

3.1. Descriptives

3.1.1. Case mix description for operated patients with malignant versus benign tumours

Table 2. Case mix description of all patients with **malignant tumours** discussed on a MC expert who underwent surgical treatment.

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Patient with surgery	598		721		739		716		801		785	
Number of patients entered in prospective clinical trial	12	2.0	26	3.6	46	6.2	34	4.7	47	5.9	37	4.7
Expert centers												
S1	68	11.4	69	9.6	78	10.6	69	9.6	82	10.2	65	8.3
S2	29	4.8	22	3.1	25	3.4	28	3.9	29	3.6	37	4.7
S3	16	2.7	24	3.3	26	3.5	16	2.2	26	3.2	34	4.3
S4	94	15.7	111	15.4	121	16.4	124	17.3	160	20	134	17.1
S5	31	5.2	34	4.7	30	4.1	27	3.8	38	4.7	34	4.3
S6	52	8.7	58	8	82	11.1	84	11.7	93	11.6	82	10.4
S7	56	9.4	56	7.8	55	7.4	57	8	39	4.9	47	6
S8	34	5.7	42	5.8	39	5.3	46	6.4	51	6.4	60	7.6
S9	59	9.9	85	11.8	77	10.4	76	10.6	78	9.7	76	9.7
S10	27	4.5	20	2.8	22	3	31	4.3	15	1.9	26	3.3
S11	23	3.8	42	5.8	33	4.5	33	4.6	29	3.6	29	3.7
S12	31	5.2	35	4.9	35	4.7	31	4.3	46	5.7	44	5.6
S13	26	4.3	51	7.1	36	4.9	27	3.8	35	4.4	29	3.7
S14	30	5	37	5.1	56	7.6	45	6.3	53	6.6	60	7.6
S15	22	3.7	35	4.9	24	3.2	22	3.1	27	3.4	28	3.6
Sex												
Male	324	54.2	385	53.4	406	54.9	387	54.1	454	56.7	408	52.0
Female	274	45.8	336	46.6	333	45.1	329	45.9	347	43.3	377	48.0

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Age at surgery												
<=69	348	58.2	403	55.9	404	54.7	394	55.0	430	53.7	428	54.5
70-79	190	31.8	259	35.9	260	35.2	247	34.5	288	36.0	270	34.4
>=80	60	10.0	59	8.2	75	10.1	75	10.5	83	10.4	87	11.1
Lesion to treat (in (peri-)pancreas)												
Primary tumour	581	97.2	687	95.3	722	97.7	694	96.9	779	97.3	762	97.1
Relapse of primary tumour	12	2.0	18	2.5	9	1.2	9	1.3	5	0.6	10	1.3
Metastasis	5	0.8	16	2.2	8	1.1	13	1.8	17	2.1	11	1.4
Missing	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3
Malignant morphology												
Adenocarcinoma	476	79.6	554	76.8	552	74.7	545	76.1	579	72.3	565	72.0
Neuroendocrine tumour	67	11.2	114	15.8	123	16.6	102	14.2	130	16.2	136	17.3
Other or unspecified	55	9.2	53	7.4	64	8.7	69	9.6	92	11.5	84	10.7
Primary tumour localisation												
C17.0 Duodenum	36	6.0	21	2.9	39	5.3	49	6.8	36	4.5	43	5.5
C24.0 Extrahepatic bile duct	43	7.2	50	6.9	44	6.0	40	5.6	33	4.1	42	5.4
C24.1 (Peri-) ampullary region	54	9.0	73	10.1	73	9.9	73	10.2	72	9.0	79	10.1
C25.0 Head of pancreas	288	48.2	307	42.6	329	44.5	306	42.7	344	42.9	334	42.5
C25.1 Body of pancreas	33	5.5	85	11.8	72	9.7	73	10.2	110	13.7	68	8.7
C25.2 Tail of pancreas	74	12.4	108	15.0	109	14.7	111	15.5	141	17.6	156	19.9
C25.3 Pancreatic duct	5	0.8	4	0.6	1	0.1	4	0.6	4	0.5	1	0.1
C25.4 Islands of Langerhans	0	0.0	4	0.6	22	3.0	7	1.0	1	0.1	1	0.1

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
C25.7-9 Other specified parts of pancreas	43	7.2	44	6.1	36	4.9	27	3.8	31	3.9	38	4.8
Missing or benign	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.3
Other	22	3.7	25	3.5	14	1.9	26	3.6	29	3.6	21	2.7
Clinical stage												
0	12	2.1	6	0.9	23	3.2	14	2.0	29	3.7	27	3.5
I	278	48.5	334	47.9	358	49.9	339	48.6	410	52.4	415	54.0
II	145	25.3	228	32.7	198	27.6	215	30.8	199	25.4	211	27.4
III	63	11.0	61	8.8	84	11.7	85	12.2	87	11.1	68	8.8
IV	11	1.9	23	3.3	21	2.9	19	2.7	22	2.8	17	2.2
X	64	11.2	45	6.5	34	4.7	25	3.6	36	4.6	31	4.0
TNM not applicable or relapse*	25	-	24	-	21	-	19	-	18	-	16	-
Pathological stage												
0	12	2.5	18	3.1	35	6.0	24	4.4	37	5.9	50	7.9
I	115	24.4	163	27.9	159	27.1	129	23.8	178	28.4	178	28.0
II	155	32.8	200	34.2	207	35.3	192	35.5	194	31.0	229	36.0
III	157	33.3	163	27.9	165	28.2	179	33.1	193	30.8	149	23.4
IV	17	3.6	28	4.8	16	2.7	11	2.0	14	2.2	14	2.2
X	16	3.4	12	2.1	4	0.7	6	1.1	10	1.6	16	2.5
TNM not applicable or relapse*	20	-	19	-	18	-	18	-	14	-	15	-
Neoadjuvant treatment**	106	-	118	-	135	-	157	-	161	-	134	-
yPathological stage												
0	3	3.0	4	3.5	5	3.8	5	3.2	9	5.7	5	3.8
I	42	41.6	28	24.8	43	32.6	51	32.7	58	36.9	47	35.3
II	28	27.7	45	39.8	46	34.8	53	34.0	50	31.8	53	39.8
III	25	24.8	28	24.8	30	22.7	36	23.1	29	18.5	17	12.8
IV	2	2.0	8	7.1	8	6.1	9	5.8	10	6.4	10	7.5

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
X	1	1.0	0	0.0	0	0.0	2	1.3	1	0.6	1	0.8
TNM not applicable or relapse*	5	-	5	-	3	-	1	-	4	-	1	-
No neoadjuvant treatment	492	-	603	-	604	-	559	-	640	-	651	-
Type of first diagnostic method												
CT	359	60.0	438	60.7	442	59.8	462	64.5	534	66.7	499	63.6
ERCP	19	3.2	25	3.5	26	3.5	24	3.4	25	3.1	24	3.1
EUS	99	16.6	98	13.6	97	13.1	63	8.8	76	9.5	79	10.1
MRI	98	16.4	122	16.9	145	19.6	139	19.4	135	16.9	149	19.0
PET	1	0.2	6	0.8	5	0.7	6	0.8	1	0.1	6	0.8
PET_CT	18	3.0	27	3.7	22	3.0	20	2.8	28	3.5	23	2.9
Surgery	4	0.7	5	0.7	2	0.3	1	0.1	2	0.2	5	0.6
Missing	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Method to obtain first tissue sample for APO												
CT	5	0.8	7	1.0	3	0.4	9	1.3	4	0.5	0	0.0
ERCP	66	11.0	81	11.2	65	8.8	50	7.0	49	6.1	70	8.9
EUS	336	56.2	359	49.8	390	52.8	402	56.1	429	53.6	441	56.2
MRI	6	1.0	4	0.6	5	0.7	2	0.3	0	0.0	1	0.1
Surgery	184	30.8	270	37.4	276	37.3	252	35.2	319	39.8	273	34.8
Missing	1	0.2	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Prior surgery or other treatment***												
Prior abdominal surgery	59	9.9	137	19.0	119	16.1	110	15.4	98	12.2	123	15.7
Other treatment modality (that could affect the pancreas)	66	11.0	101	14.0	109	14.7	121	16.9	142	17.7	126	16.1
Neoadjuvant treatment												
Chemotherapy	89	14.9	107	14.8	120	16.2	140	19.6	129	16.1	120	15.3
Radiotherapy	0	0.0	1	0.1	1	0.1	1	0.1	0	0.0	1	0.1

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Chemoradiotherapy	17	2.8	10	1.4	14	1.9	16	2.2	32	4.0	13	1.7
No chemo or radiation treatment	492	82.3	603	83.6	604	81.7	559	78.1	640	79.9	651	82.9
Charlson Comorbidity Index												
0	263	44.0	272	37.7	304	41.1	278	38.8	344	42.9	335	42.7
1	129	21.6	162	22.5	189	25.6	192	26.8	191	23.8	205	26.1
2	88	14.7	121	16.8	139	18.8	113	15.8	115	14.4	121	15.4
3	46	7.7	72	10.0	53	7.2	63	8.8	67	8.4	51	6.5
4	26	4.3	43	6.0	26	3.5	36	5.0	43	5.4	26	3.3
5	14	2.3	19	2.6	11	1.5	16	2.2	16	2.0	16	2.0
6	14	2.3	14	1.9	9	1.2	5	0.7	11	1.4	19	2.4
7	9	1.5	9	1.2	2	0.3	9	1.3	5	0.6	5	0.6
8	5	0.8	4	0.6	3	0.4	3	0.4	6	0.7	6	0.8
9	3	0.5	2	0.3	2	0.3	0	0.0	2	0.2	0	0.0
10	1	0.2	2	0.3	1	0.1	1	0.1	0	0.0	0	0.0
11	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1
12	0	0.0	1	0.1	0	0.0	0	0.0	1	0.1	0	0.0
WHO score at surgery												
0 - Asymptomatic, normal activity	188	31.4	176	24.4	195	26.4	144	20.1	261	32.6	273	34.8
1 - Symptomatic, but ambulant	347	58.0	462	64.1	447	60.5	491	68.6	457	57.1	398	50.7
2 - Symptomatic, bedbound < 50% day	53	8.9	70	9.7	82	11.1	70	9.8	71	8.9	96	12.2
3 - Symptomatic, bedbound > 50% day	9	1.5	12	1.7	15	2.0	11	1.5	12	1.5	17	2.2
4 - Completely dependent, 100% bedbound	1	0.2	1	0.1	0	0.0	0	0.0	0	0.0	1	0.1
ASA score												
1 - Healthy person	65	10.9	41	5.7	47	6.4	36	5.0	18	2.2	29	3.7

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
2 - Mild systemic disease, normal activity	329	55.0	395	54.8	377	51.0	349	48.7	402	50.2	372	47.4
3 - Serious systemic disease, limited activity	202	33.8	275	38.1	302	40.9	323	45.1	370	46.2	377	48.0
4 - Life-threatening illness, handicapped	2	0.3	10	1.4	13	1.8	8	1.1	11	1.4	7	0.9
Type of surgery												
Minimally invasive surgery (MIS) - Laparoscopic	134	22.4	195	27.0	221	29.9	183	25.6	187	23.3	142	18.1
Minimally invasive surgery (MIS) - Hybrid	1	0.2	0	0.0	1	0.1	1	0.1	0	0.0	0	0.0
Minimally invasive surgery (MIS) - Robotic	11	1.8	58	8.0	66	8.9	91	12.7	157	19.6	183	23.3
Open	431	72.1	432	59.9	408	55.2	409	57.1	420	52.4	413	52.6
Conversion from MIS to open surgery	21	3.5	36	5.0	43	5.8	32	4.5	37	4.6	47	6.0
Resectability status****												
<i>Before neoadjuvant treatment</i>												
Upfront resectable	-	-	10	15.4	33	24.1	31	18.6	40	23.0	33	23.4
Borderline resectable	-	-	41	63.1	75	54.7	112	67.1	95	54.6	91	64.5
Unresectable	-	-	14	21.5	27	19.7	14	8.4	26	14.9	10	7.1
No neoadjuvant treatment	-	-	342	-	604	-	559	-	640	-	651	-
<i>Before surgery</i>												
Upfront resectable	-	-	347	48.1	640	86.6	613	85.6	681	85.0	703	89.6
Borderline resectable	-	-	53	7.4	93	12.6	99	13.8	108	13.5	78	9.9
Unresectable	-	-	1	0.1	5	0.7	4	0.6	12	1.5	4	0.5
Missing	-	-	6	0.8	1	0.1	0	0.0	0	0.0	0	0.0

Belgium												
Characteristic	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Simultaneous venous resection</i>												
No	484	80.9	635	88.1	640	86.6	609	85.1	699	87.3	680	86.6
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	114	19.1	86	11.9	99	13.4	107	14.9	102	12.7	105	13.4
With primary wedge-reconstruction	36	-	24	-	27	-	39	-	37	-	39	-
With primary end-to-end reconstruction	42	-	47	-	55	-	36	-	30	-	36	-
With vascular autograft interposition	1	-	3	-	3	-	4	-	1	-	3	-
With vascular allograft interposition	9	-	3	-	8	-	12	-	28	-	17	-
With synthetic/prosthetic interposition	3	-	1	-	2	-	1	-	3	-	2	-
With peritoneal patch wedge-reconstruction	19	-	8	-	4	-	9	-	3	-	7	-
Without reconstruction	4	-	0	-	0	-	6	-	0	-	1	-
<i>Simultaneous arterial resection***</i>												
No	580	97.0	711	98.6	722	97.7	701	97.9	791	98.8	776	98.9
Hepatic artery resection	5	0.8	7	1.0	6	0.8	7	1.0	3	0.4	4	0.5
With primary wedge-reconstruction	0	-	0	-	0	-	0	-	0	-	0	-
With primary end-to-end reconstruction	4	-	4	-	4	-	4	-	1	-	2	-
With vascular autograft interposition	0	-	0	-	0	-	0	-	0	-	1	-
With vascular allograft interposition	1	-	0	-	0	-	0	-	0	-	0	-

Belgium												
Characteristic	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	N	%	N	%	N	%	N	%	N	%	N	%
With synthetic/prosthetic interposition	0	-	0	-	0	-	0	-	0	-	0	-
Without reconstruction	0	-	3	-	2	-	3	-	2	-	1	-
Coeliac trunk resection	9	1.5	3	0.4	8	1.1	7	1.0	5	0.6	5	0.6
With primary wedge-reconstruction	0	-	0	-	0	-	0	-	0	-	1	-
With primary end-to-end reconstruction	0	-	0	-	1	-	0	-	1	-	0	-
With vascular autograft interposition	0	-	0	-	0	-	0	-	0	-	0	-
With vascular allograft interposition	0	-	0	-	0	-	0	-	0	-	0	-
With synthetic/prosthetic interposition	0	-	0	-	0	-	0	-	0	-	0	-
Without reconstruction	9	-	3	-	7	-	7	-	4	-	4	-
Superior mesenteric artery (SMA) resection	4	0.7	0	0.0	2	0.3	1	0.1	2	0.2	0	0.0
With primary wedge-reconstruction	1	-	0	-	0	-	0	-	0	-	0	-
With primary end-to-end reconstruction	1	-	0	-	0	-	0	-	2	-	0	-
With vascular autograft interposition	0	-	0	-	2	-	0	-	0	-	0	-
With vascular allograft interposition	0	-	0	-	0	-	0	-	0	-	0	-
With synthetic/prosthetic interposition	0	-	0	-	0	-	0	-	0	-	0	-
Without reconstruction	2	-	0	-	0	-	1	-	0	-	0	-

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
<i>Simultaneous other organ resection***</i>												
No	383	64.0	458	63.5	426	57.6	436	60.9	455	56.8	498	63.4
Colon	29	4.8	13	1.8	11	1.5	22	3.1	28	3.5	17	2.2
Stomach	54	9.0	112	15.5	152	20.6	124	17.3	121	15.1	92	11.7
Adrenal gland	14	2.3	14	1.9	17	2.3	17	2.4	25	3.1	11	1.4
Spleen	96	16.1	139	19.3	157	21.2	149	20.8	216	27.0	188	23.9
Other	88	14.7	34	4.7	27	3.7	27	3.8	60	7.5	37	4.7
<i>RIZIV code for complex surgery</i>												
242830-242841: Pancreaticoduodenectomy	459	76.8	499	69.2	513	69.4	498	69.6	517	64.5	530	67.5
Pancreaticoduodenectomy	422	91.9	462	92.6	474	92.4	453	91.0	461	89.2	478	90.2
Total Pancreatectomy	37	8.1	37	7.4	39	7.6	45	9.0	56	10.8	52	9.8
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	43	7.2	70	9.7	55	7.4	82	11.5	58	7.2	46	5.9
242874-242885: Hemipancreatectomy left	88	14.7	142	19.7	160	21.7	130	18.2	214	26.7	197	25.1
242896-242900: Enucleation of a pancreatic tumour	8	1.3	10	1.4	11	1.5	6	0.8	12	1.5	12	1.5
<i>Antithrombotic medication</i>												
No	419	70.1	503	69.8	531	71.9	505	70.5	553	69.0	554	70.6
Yes	179	29.9	218	30.2	208	28.1	211	29.5	248	31.0	231	29.4
<i>Was the patient referred?</i>												
No	270	45.2	307	42.6	322	43.6	290	40.5	367	45.8	385	49.0
Yes	328	54.8	414	57.4	417	56.4	426	59.5	434	54.2	400	51.0

**: Tumours for which staging is not possible.*

***.: Neoadjuvant treatment: patients who received either chemotherapy or radiotherapy, or a combination of these treatments prior to surgery.*

****.: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.*

*****.: Results for this variable are only available from the second half of Y2 onwards.*

Table 3. Case mix description of all patients with **benign tumours** discussed on a MC expert who underwent surgical treatment.

Belgium												
Characteristic	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	N	%	N	%	N	%	N	%	N	%	N	%
Patient with surgery	126		135		112		118		112		108	
Expert centers												
S1	10	7.9	5	3.7	9	8.0	11	9.3	10	8.9	7	6.5
S2	6	4.8	11	8.1	7	6.2	11	9.3	10	8.9	5	4.6
S3	3	2.4	4	3.0	2	1.7	1	0.9	5	4.6	0	0.0
S4	37	29.4	35	25.9	26	23.2	11	9.3	16	14.3	8	7.4
S5	2	1.6	8	5.9	3	2.7	6	5.1	4	3.6	3	2.8
S6	11	8.7	6	4.4	10	8.9	10	8.5	7	6.2	7	6.5
S7	9	7.1	19	14.1	6	5.4	15	12.7	8	7.1	14	13.0
S8	5	4.0	8	5.9	5	4.5	6	5.1	3	2.7	6	5.6
S9	18	14.3	11	8.1	13	11.6	19	16.1	13	11.6	16	14.8
S10	5	4.0	4	3.0	8	7.1	2	1.7	8	7.1	7	6.5
S11	4	3.2	2	1.5	4	3.6	4	3.4	2	1.8	3	2.8
S12	6	4.8	11	8.1	9	8.0	9	7.6	8	7.1	4	3.7
S13	3	2.4	4	3.0	5	4.5	3	2.5	2	1.8	6	5.6
S14	4	3.2	6	4.4	4	3.6	6	5.1	19	17.0	16	14.8
S15	3	2.4	1	0.7	3	2.7	3	2.5	1	0.9	1	0.9
Sex												
Female	59	46.8	65	48.1	64	57.1	68	57.6	54	48.2	58	53.7
Male	67	53.2	70	51.9	48	42.9	50	42.4	58	51.8	50	46.3
Age at surgery												
<=69	81	64.3	82	60.7	75	67.0	65	55.1	65	58.0	60	55.6
70-79	42	33.3	46	34.1	31	27.7	48	40.7	38	33.9	41	38.0
>=80	3	2.4	7	5.2	6	5.4	5	4.2	9	8.0	7	6.5
Benign Tumoural Morphology												
Adenoma	11	8.7	4	3.0	9	8.0	8	6.8	8	7.1	6	5.6

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Cystadenoma	26	20.6	31	23.0	31	27.7	26	22.0	21	18.8	28	25.9
IPMN	67	53.2	78	57.8	61	54.5	71	60.2	73	65.2	64	59.3
Other_benign	22	17.5	22	16.3	11	9.8	13	11.0	10	8.9	10	9.3
Prior surgery or other treatment **												
Prior abdominal surgery	9	7.1	15	11.1	18	16.1	17	14.4	23	20.5	21	19.4
Other treatment modality (that could affect the pancreas)	1	0.8	2	1.5	3	2.7	5	4.2	7	6.2	6	5.6
Charlson Comorbidity Index												
0	58	46.0	63	46.7	46	41.1	57	48.3	44	39.3	54	50.0
1	33	26.2	36	26.7	22	19.6	23	19.5	29	25.9	15	13.9
2	17	13.5	19	14.1	19	17.0	23	19.5	15	13.4	20	18.5
3	9	7.1	9	6.7	13	11.6	3	2.5	8	7.1	9	8.3
4	4	3.2	5	3.7	7	6.2	8	6.8	7	6.2	2	1.9
5	3	2.4	2	1.5	0	0.0	2	1.7	3	2.7	3	2.8
6	2	1.6	1	0.7	2	1.8	1	0.8	2	1.8	3	2.8
7	0	0.0	0	0.0	1	0.9	0	0.0	2	1.8	2	1.9
8	0	0.0	0	0.0	0	0.0	1	0.8	2	1.8	0	0.0
9	0	0.0	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0
11	0	0.0	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0
WHO score at surgery												
0 - Asymptomatic, normal activity	66	52.4	61	45.2	58	51.8	45	38.1	51	45.5	40	37.0
1 - Symptomatic, but ambulant	55	43.7	64	47.4	46	41.1	67	56.8	53	47.3	59	54.6
2 - Symptomatic, bedbound < 50% day	5	4.0	8	5.9	8	7.1	5	4.2	8	7.1	8	7.4
3 - Symptomatic, bedbound > 50% day	0	0.0	2	1.5	0	0.0	1	0.8	0	0.0	1	0.9

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
4 - Completely dependent, 100% bedbound	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ASA score												
1 - Healthy person	15	11.9	21	15.6	12	10.7	6	5.1	8	7.1	9	8.3
2 - Mild systemic disease, normal activity	75	59.5	78	57.8	62	55.4	68	57.6	55	49.1	74	68.5
3 - Serious systemic disease, limited activity	35	27.8	35	25.9	38	33.9	42	35.6	49	43.8	25	23.1
4 - Life-threatening illness, handicapped	1	0.8	1	0.7	0	0.0	2	1.7	0	0.0	0	0.0
Type of surgery												
Conversion from MIS to open surgery	5	4.0	7	5.2	3	2.7	3	2.5	4	3.6	2	1.9
Minimally invasive surgery (MIS) - Hybrid	0	0.0	2	1.5	0	0.0	0	0.0	0	0.0	0	0.0
Minimally invasive surgery (MIS) - Laparoscopic	58	46.0	62	45.9	54	48.2	37	31.4	31	27.7	25	23.1
Minimally invasive surgery (MIS) - Robotic	7	5.6	12	8.9	20	17.9	25	21.2	41	36.6	41	38.0
Open	56	44.4	52	38.5	35	31.2	53	44.9	36	32.1	40	37.0
Simultaneous vascular resection												
No vascular reconstruction	125	99.2	132	97.8	111	99.1	116	98.3	111	99.1	105	97.2
Simultaneous arterial resection**	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	1	0.8	3	2.2	1	0.9	2	1.7	1	0.9	2	1.9
Simultaneous other organ resection												
No	82	65.1	88	65.2	76	67.9	74	62.7	63	56.2	58	53.7

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Colon	0	0.0	3	2.2	0	0.0	2	1.7	0	0.0	0	0.0
Stomach	3	2.4	7	5.2	7	6.2	11	9.3	6	5.4	9	8.3
Adrenal gland	1	0.8	0	0.0	1	0.9	0	0.0	0	0.0	1	0.9
Spleen	30	23.8	40	29.6	29	25.9	33	28.0	44	39.3	40	37.0
Other	16	12.7	4	3.0	2	1.8	3	2.5	2	1.8	4	3.7
RIZIV code for complex surgery												
242830-242841: Pancreaticoduodenectomy	67	53.2	62	45.9	46	41.1	53	44.9	49	43.8	44	40.7
Pancreaticoduodenectomy	56	83.6	51	82.3	39	84.8	40	75.5	42	85.7	34	79.1
Total Pancreatectomy	11	16.4	11	17.7	7	15.2	13	24.5	7	14.3	9	20.9
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	15	11.9	21	15.6	21	18.8	23	19.5	13	11.6	9	8.3
242874-242885: Hemipancreatectomy left	41	32.5	47	34.8	39	34.8	40	33.9	49	43.8	55	50.9
242896-242900: Enucleation of a pancreatic tumour	3	2.4	5	3.7	6	5.4	2	1.7	1	0.9	0	0.0
Antithrombotic medication												
No	95	75.4	98	72.6	79	70.5	83	70.3	80	71.4	78	72.2
Yes	31	24.6	37	27.4	33	29.5	35	29.7	32	28.6	30	27.8
Was the patient referred?												
No	66	52.4	71	52.6	62	55.4	63	53.4	70	62.5	55	50.9
Yes	60	47.6	64	47.4	50	44.6	55	46.6	42	37.5	53	49.1

**. Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

3.1.2. Completeness of registration

The indicator 'completeness of malignant cases' assesses for how many patients with malignant tumours surgery was performed in the sixth convention year and how many of these patients were actually registered in the complex surgery database. These data are based on information that was extracted from the pathology reports from all Belgian laboratories for Pathological Anatomy.

Minimum target value: $\geq 95\%$ for the sixth convention year.

Table 4. Completeness of **malignant** cases: Total number of patients with performed surgeries registered by expert centre in the sixth convention year.

Belgium, recognised centres			
	n registered	N performed	n/N (%)
Patients with surgery in Year 6	785	785	100
Expert centers			
S1	65	65	100
S2	37	37	100
S3	34	34	100
S4	134	134	100
S5	34	34	100
S6	82	82	100
S7	47	47	100
S8	60	60	100
S9	76	76	100
S10	26	26	100
S11	29	29	100
S12	44	44	100
S13	29	29	100
S14	60	60	100
S15	28	28	100

The indicator 'completeness of registration forms' indicates for how many patients a fully completed dataset was received (including all requested complex surgery variables and textual reports).

Minimum target value: $\geq 95\%$ for the sixth convention year.

Table 5. Completeness of registration forms for patients with tumoural pathology (**malignant and benign tumours**): number of registrations in complex surgery database that were complete in the sixth convention year.

Belgium			
Patient group	N registered	n complete	n/N (%)
Patients discussed on a MC in Year 6	2,309	2,301	99.7
Surgery status			
Patients with surgery in Year 6	893	885	99.1
Patients without surgery in Year 6	1,416	1,416	100.0
Expert centers			
S1	143	142	99.3
S2	128	128	100.0
S3	135	135	100.0
S4	317	317	100.0
S5	83	83	100.0
S6	210	210	100.0
S7	176	176	100.0
S8	176	176	100.0
S9	195	193	99.0
S10	84	80	95.2
S11	71	71	100.0
S12	115	115	100.0
S13	129	129	100.0
S14	250	249	99.6
S15	97	97	100.0

3.2. Process indicators

3.2.1. Time between diagnosis and start of treatment

Normally this time frame is calculated between the date of anatomopathological confirmation (incidence date) and start of treatment. But since not all tumours can be confirmed histologically before surgical treatment, we will divide this indicator into 2 parts:

- For all patients: time between suspected diagnosis and start of treatment. The date of suspected diagnosis is the date of the first diagnostic method (CT, MRI, PET, PET/CT, ERCP, EUS, surgery, ...). This is the date of the first discovery of a tumour or mass and not the confirmation of a malignancy or a more specific diagnosis.
- Only for patients with histological confirmation before surgical treatment: time between confirmed diagnosis and start of treatment.

Start of treatment is defined as the start of the first oncological treatment, which can be any neoadjuvant treatment or surgery.

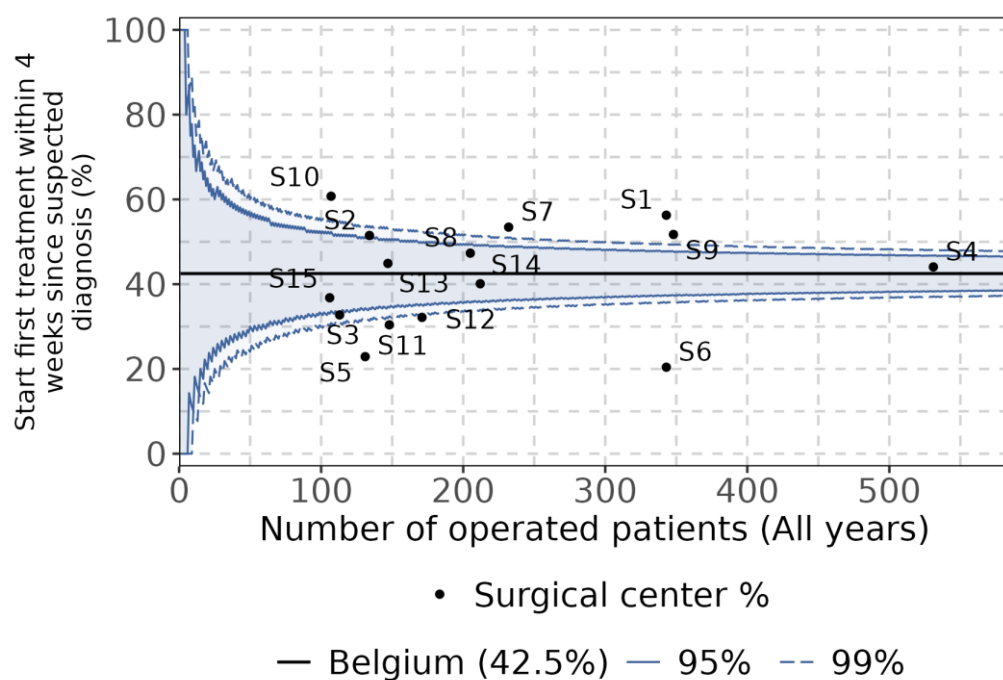
3.2.1.1. Time between suspected diagnosis and start of first treatment for patients with (suspected) adenocarcinoma

Table 6. Proportion of operated patients with **suspected adenocarcinoma** in the six convention years for whom first treatment started within 4 weeks since suspected diagnosis.

Belgium				
Patient group	N	n	n/N (%)	95% CI
Operated patients with suspected adenocarcinoma	3,271	1,389	42.5	[40.8, 44.2]
Convention year				
Year 1	476	236	49.6	[45.0, 54.2]
Year 2	554	245	44.2	[40.0, 48.5]
Year 3	552	240	43.5	[39.3, 47.7]
Year 4	545	236	43.3	[39.1, 47.6]
Year 5	579	219	37.8	[33.9, 41.9]
Year 6	565	213	37.7	[33.7, 41.8]
Referral status				
Operated patients referred to an expert centre	1,907	775	40.6	[38.4, 42.9]
Operated patients without referral	1,364	614	45.0	[42.4, 47.7]

Figure 4. Funnel and spaghetti plot of the proportion of all operated patients with suspected **adenocarcinoma** for whom first treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

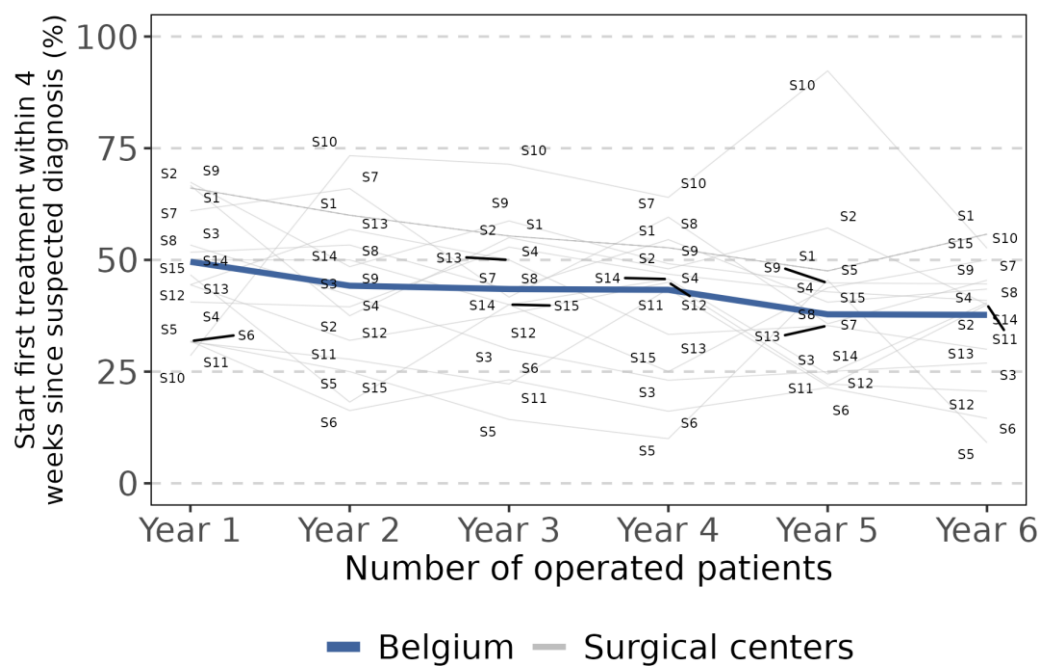
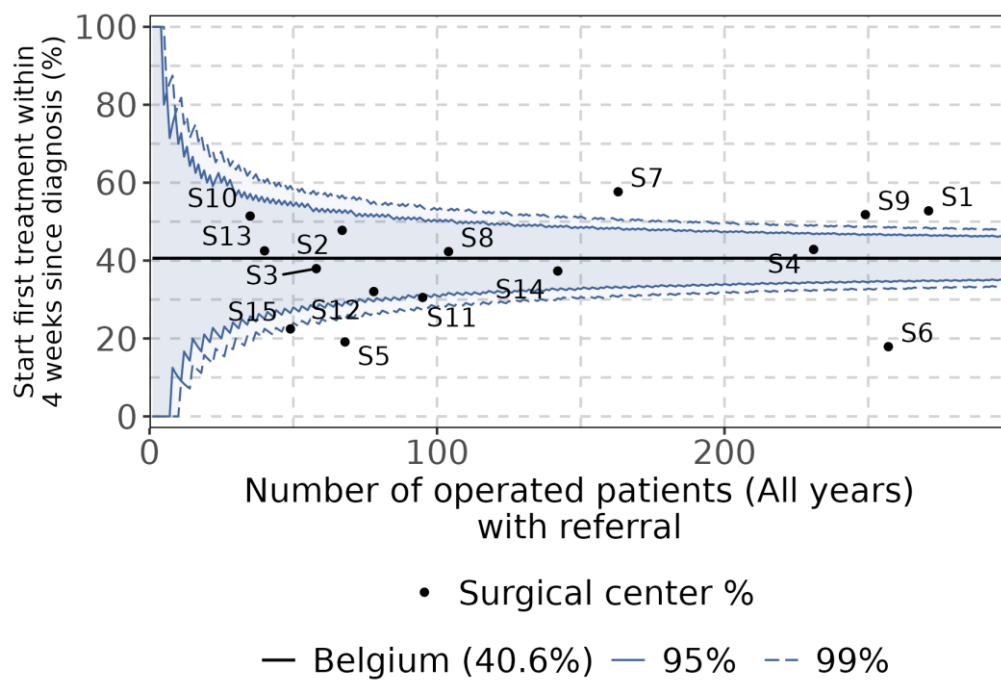


Figure 5. Funnel and spaghetti plot of the proportion of all operated patients **referred to an expert centre with suspected adenocarcinoma** for whom first treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

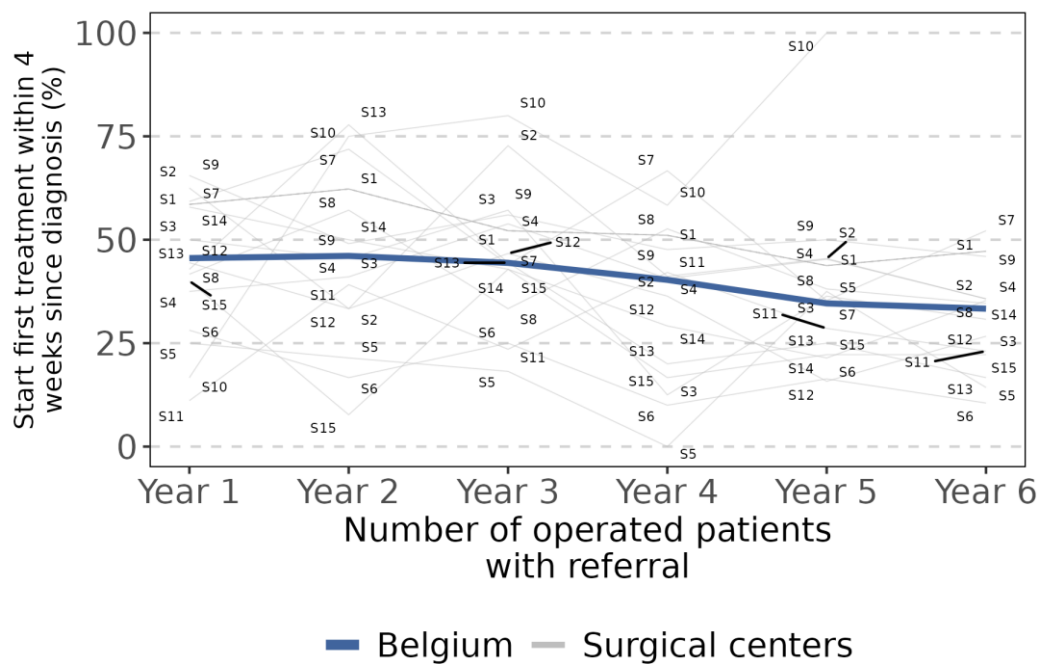
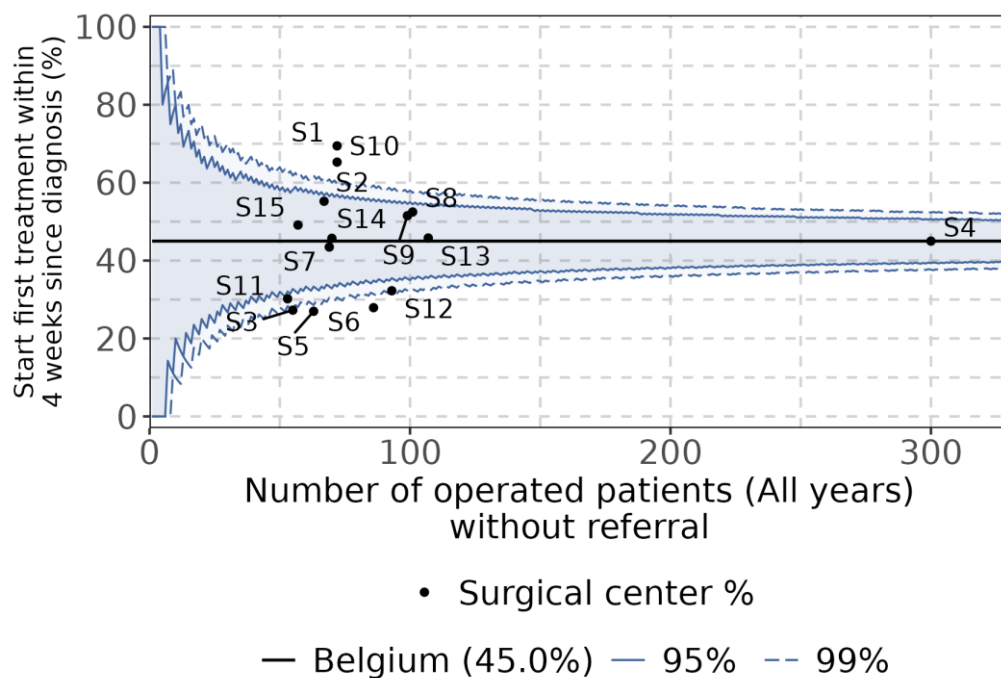


Figure 6. Funnel and spaghetti plot of the proportion of all operated patients **without referral** (=direct presentation at expert centre) with suspected **adenocarcinoma** for whom first treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

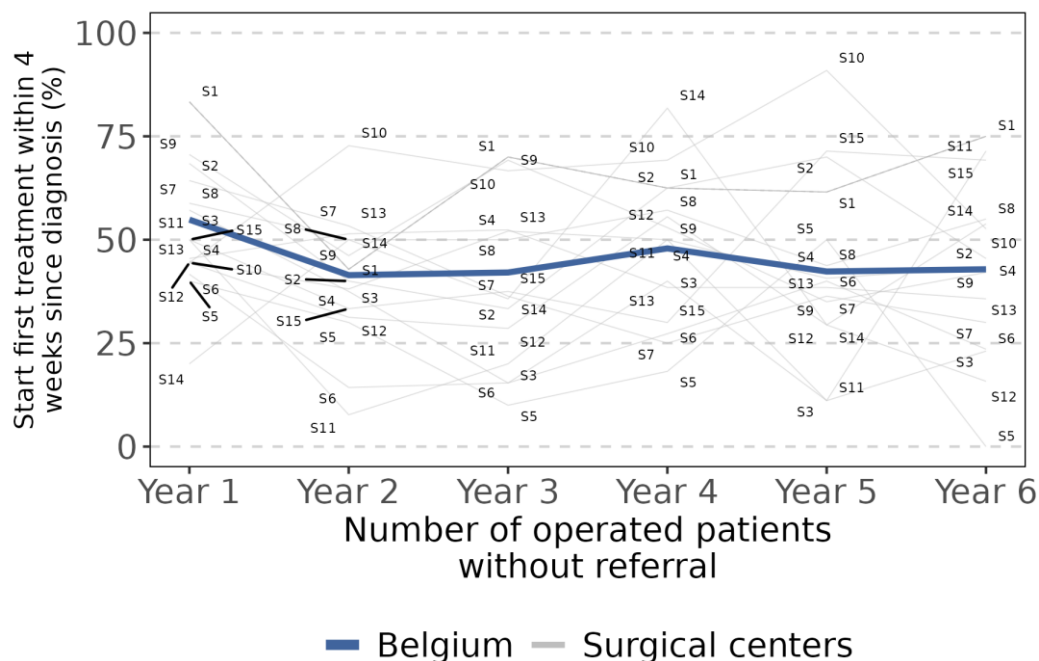


Table 7. Median time between **suspected** diagnosis of **adenocarcinoma** and start of first treatment in the six convention years.

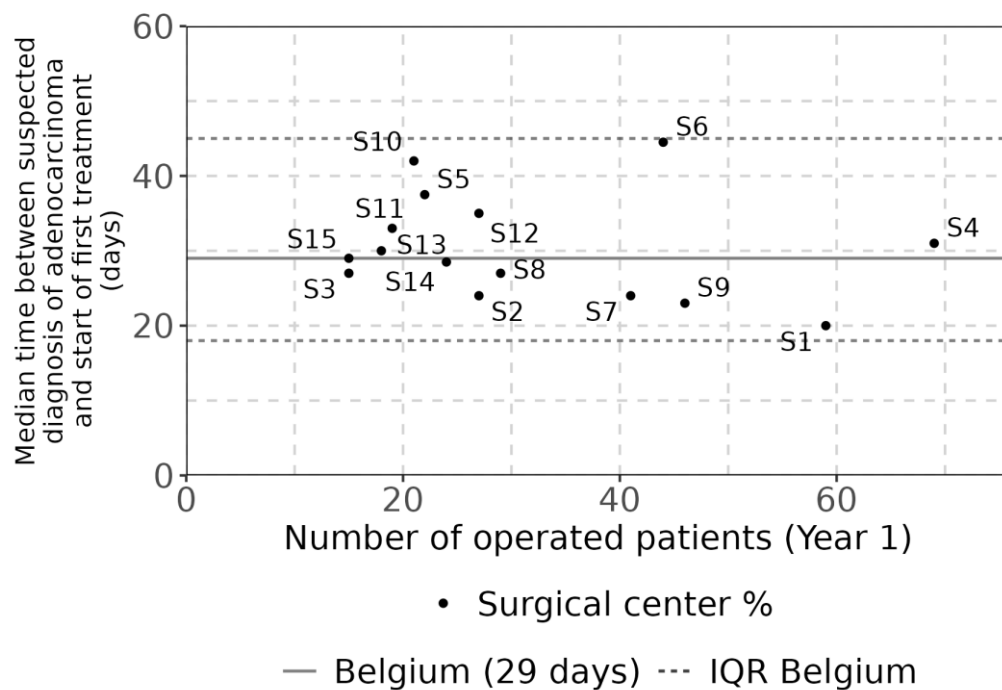
Belgium				
Patient group	N	Median (days)	IQR*	P90**
Operated patients with suspected adenocarcinoma	3,271	33	[21, 51]	82.0
Convention year				
Year 1	476	29	[18, 45]	77.0
Year 2	554	32	[20, 48]	84.0
Year 3	552	33	[20, 50]	80.0
Year 4	545	32	[20, 47]	77.0
Year 5	579	35	[23, 55]	82.6
Year 6	565	35	[22, 56]	90.0
Referral status				
Operated patients referred to an expert centre	1,907	34	[21, 51]	78.8
Operated patients without referral	1,364	31	[20, 50]	88.0

*: Interquartile Range=[the 25th, and 75th percentiles of the data]

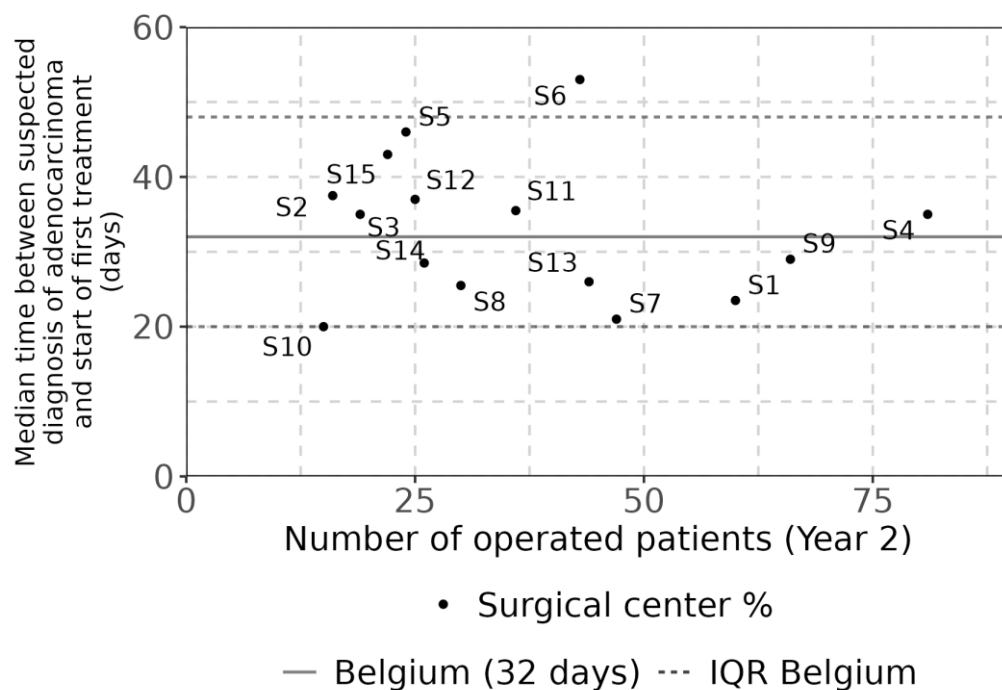
**: 90th percentile

Figure 7. Median time between **suspected** diagnosis of **adenocarcinoma** and start of first treatment, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 (f) year 6 and (g) all years combined.

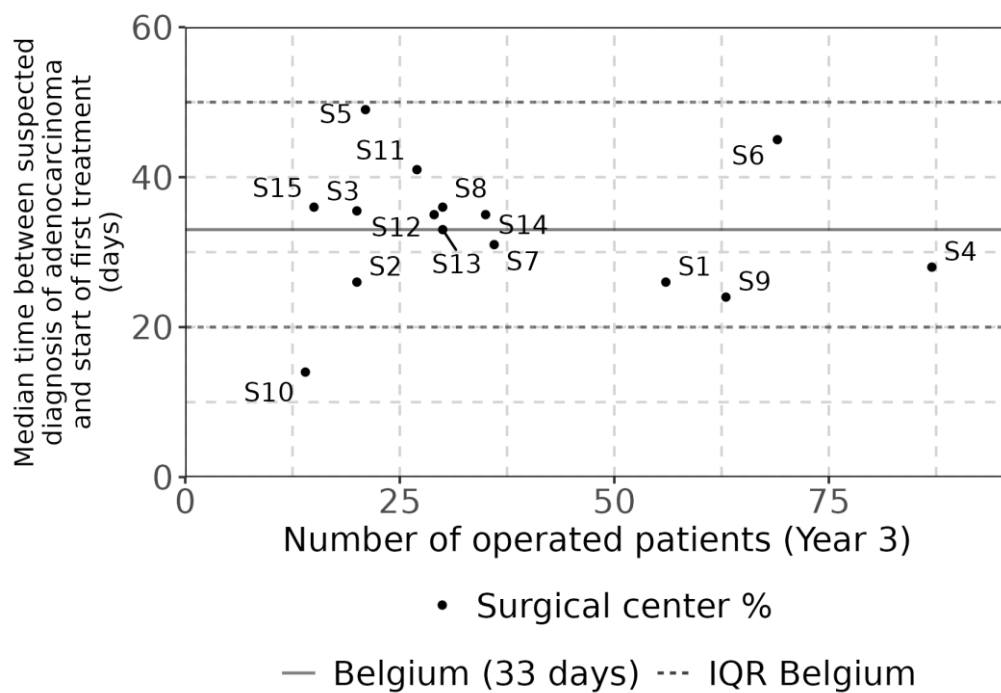
a)



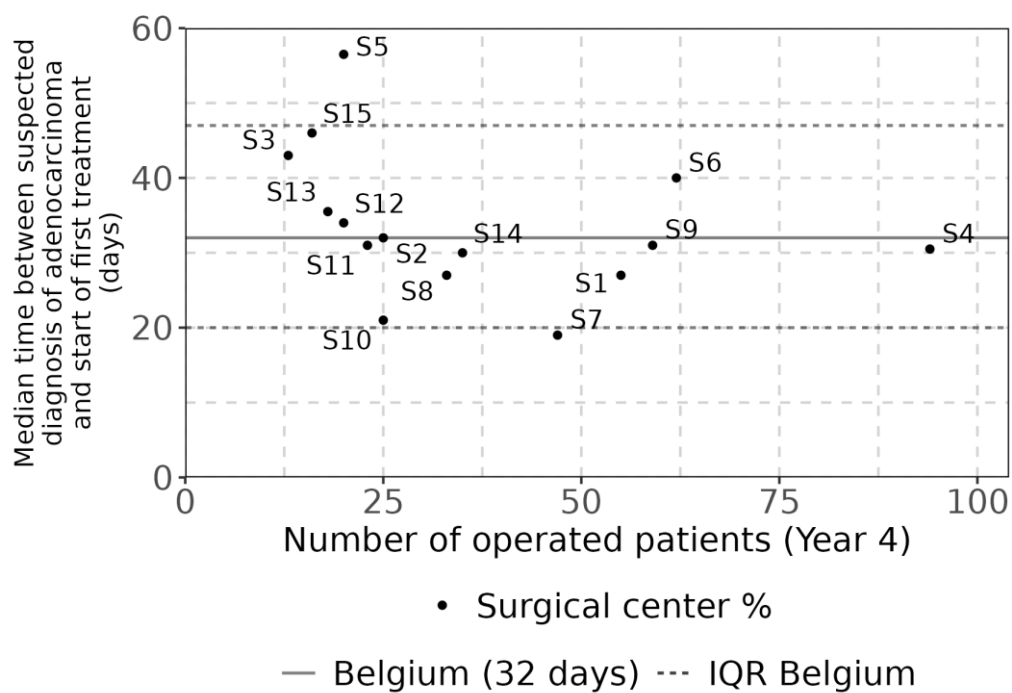
b)



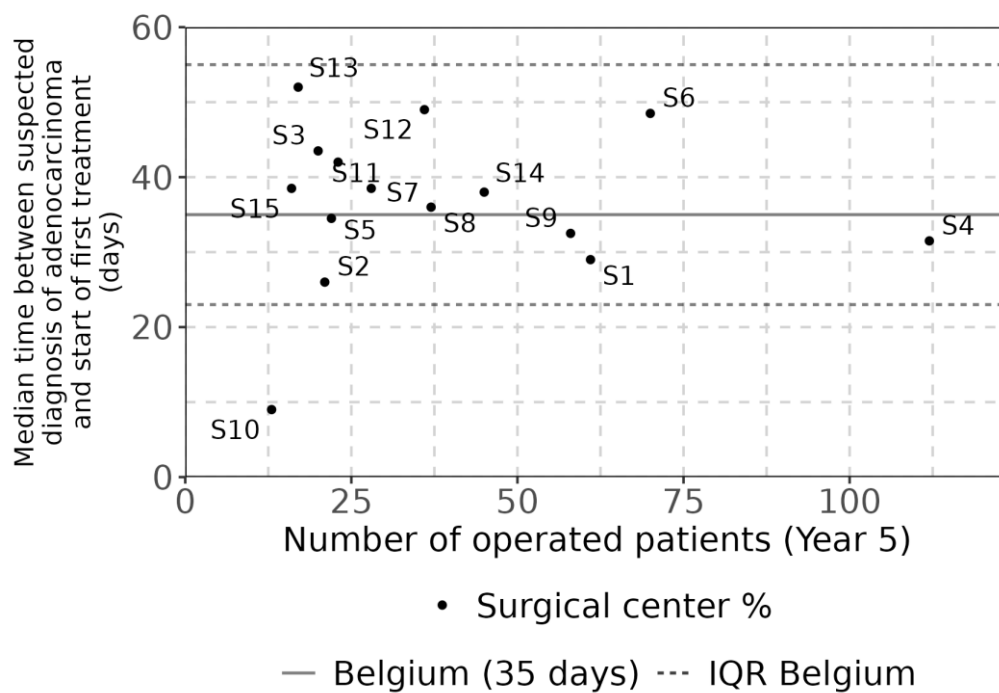
c)



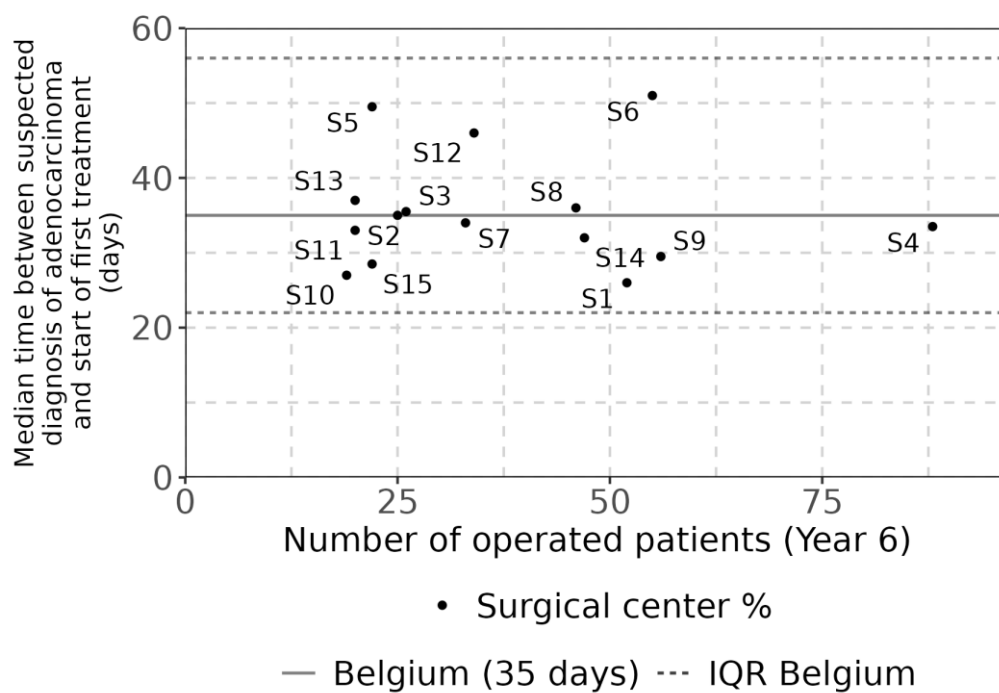
d)



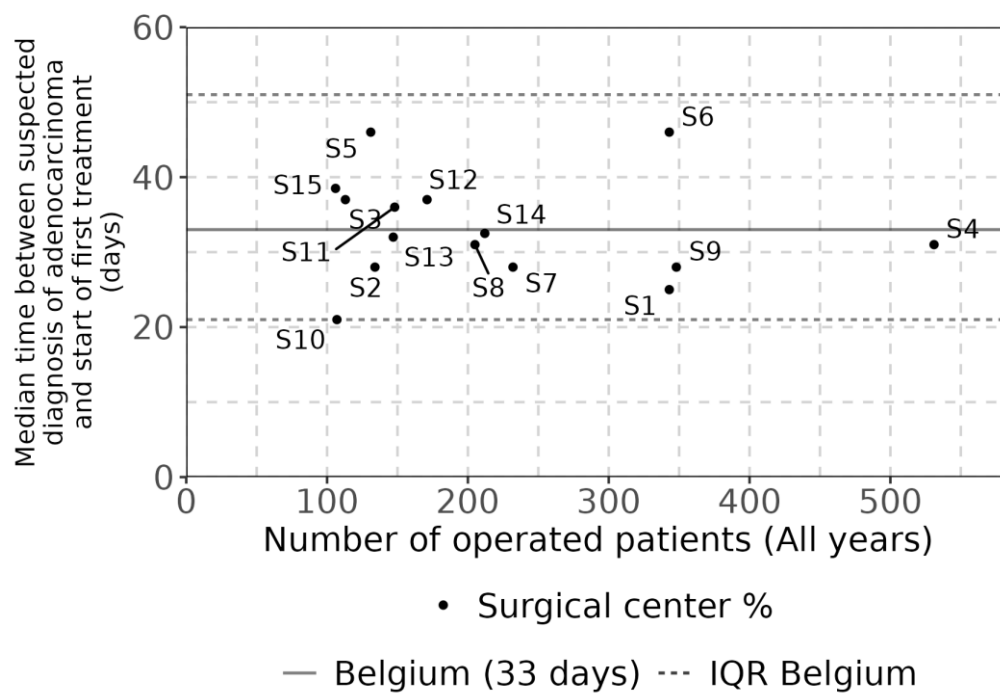
e)



f)



g)



3.2.1.2. Time between confirmed diagnosis and start of first treatment for patients with adenocarcinoma

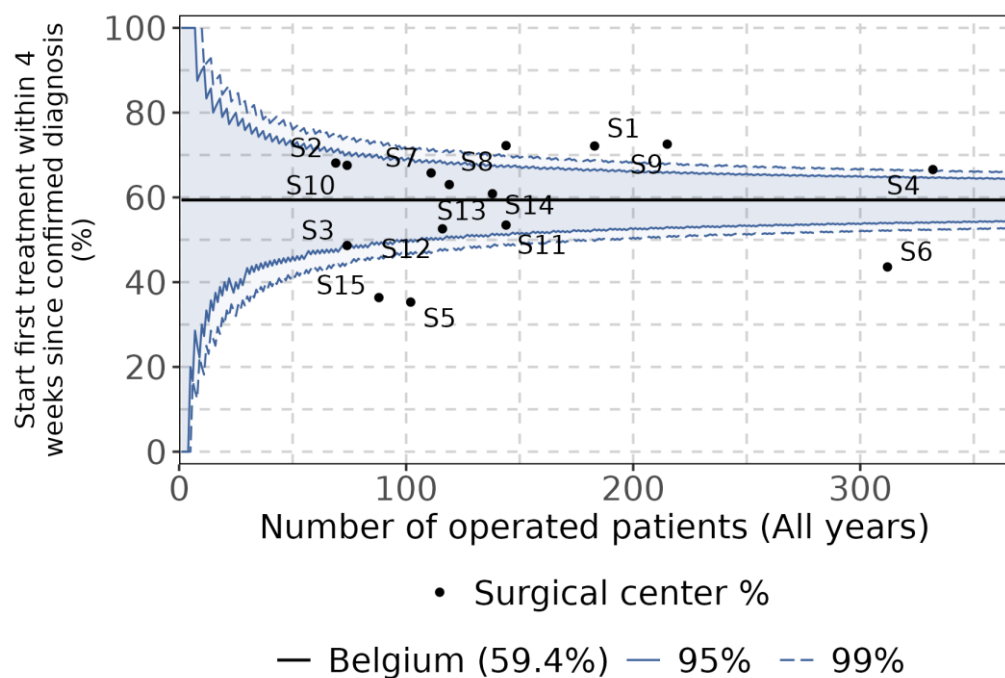
Table 8. Proportion of operated patients with **adenocarcinoma** in the six convention years for whom first treatment started within 4 weeks since **confirmed** diagnosis.

Belgium				
Patient group	N	n	n/N (%)	95% CI
Operated patients with confirmed adenocarcinoma	2,221	1,320	59.4	[57.4, 61.5]
Convention year				
Year 1	336	225	67.0	[61.7, 72.0]
Year 2	364	220	60.4	[55.2, 65.5]
Year 3	367	202	55.0	[49.8, 60.2]
Year 4	362	231	63.8	[58.6, 68.8]
Year 5	386	226	58.5	[53.5, 63.5]
Year 6	406	216	53.2	[48.2, 58.1]
Referral status				
Operated patients referred to an expert centre	1,317	747	56.7	[54.0, 59.4]
Operated patients without referral	904	573	63.4	[60.1, 66.5]

Remark: only operated patients with a histologically confirmed diagnosis are shown in this table.

Figure 8. Funnel and spaghetti plot of the proportion of all operated patients with **adenocarcinoma** for whom first treatment started within 4 weeks since **confirmed** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

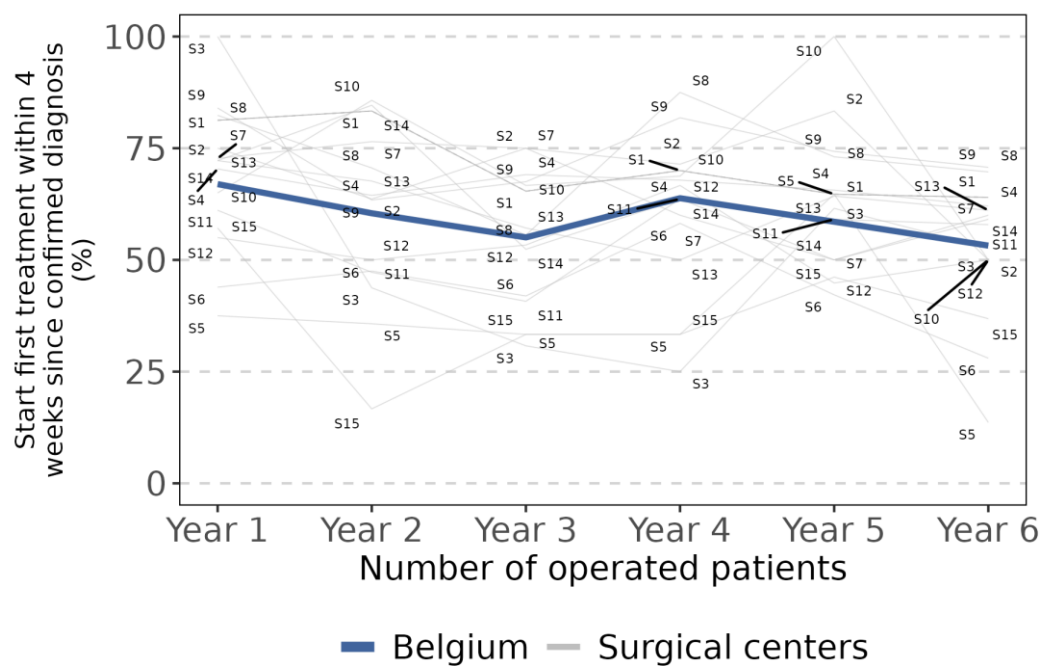
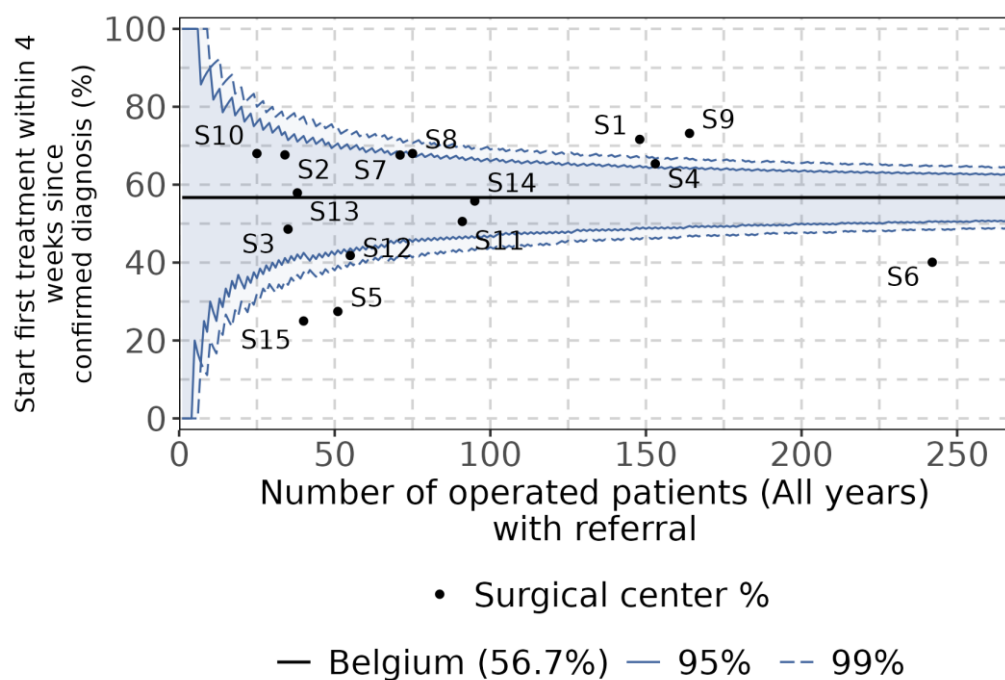


Figure 9. Funnel and spaghetti plot of the proportion of all operated patients **referred to an expert centre with adenocarcinoma** for whom first treatment started within 4 weeks since **confirmed** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

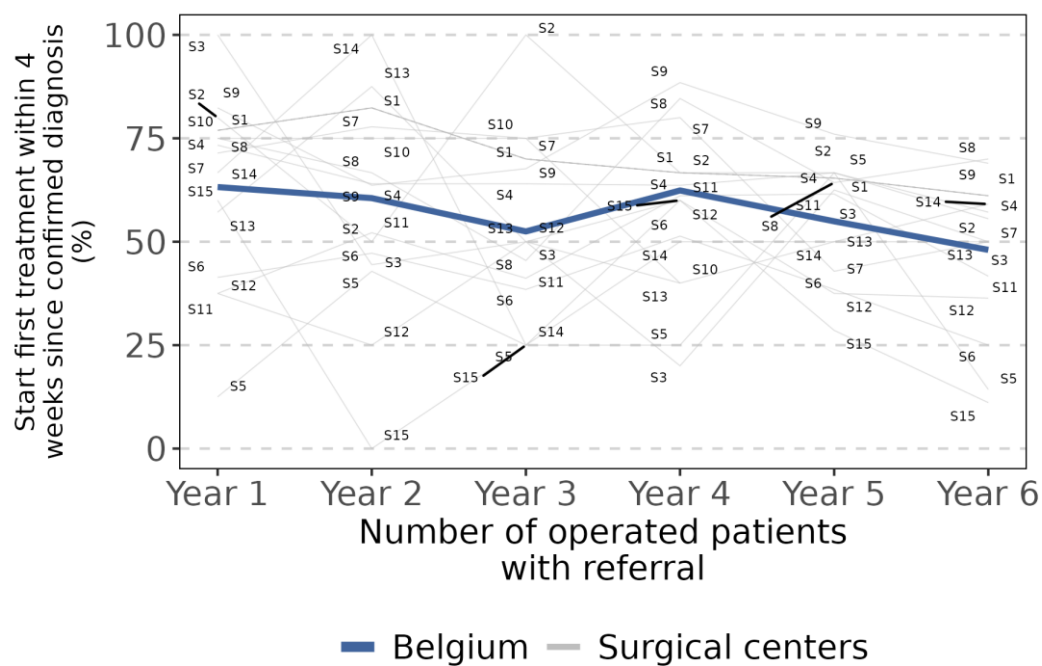
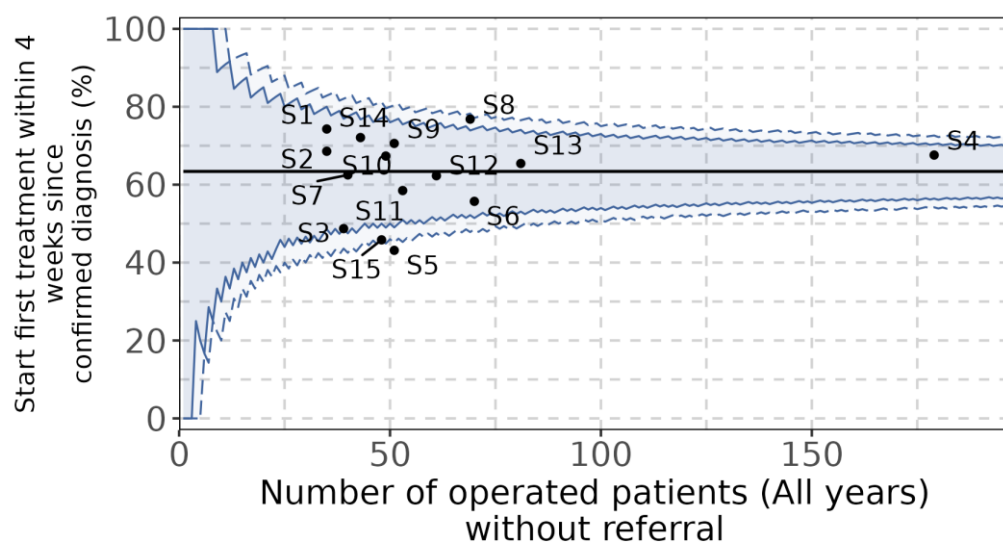


Figure 10. Funnel and spaghetti plot of the proportion of all operated patients **without referral** (= direct presentation at expert centre) with **adenocarcinoma** for whom first treatment started within 4 weeks since **confirmed** diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

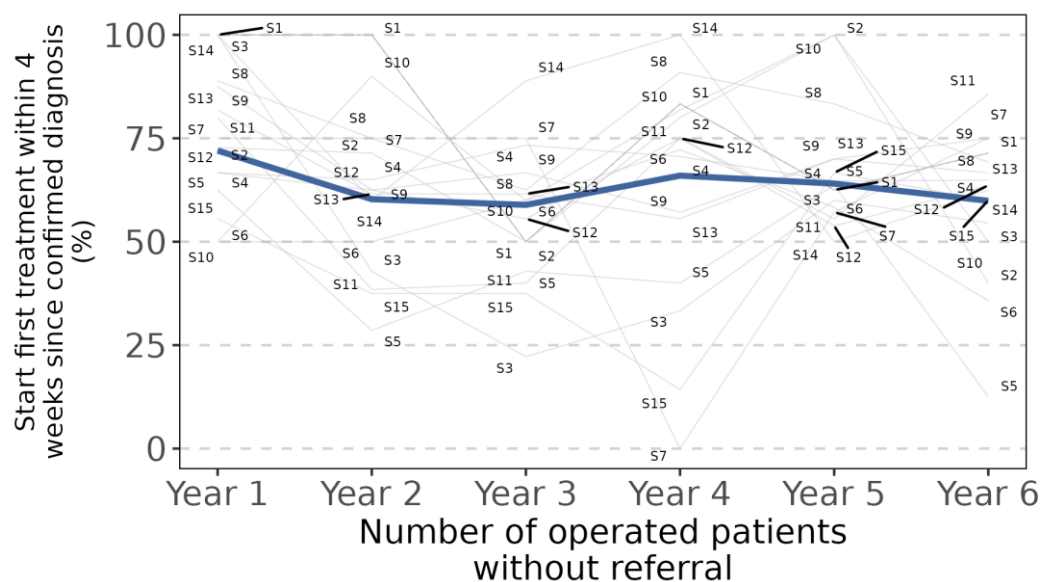
a)



• Surgical center %

— Belgium (63.4%) — 95% -- 99%

b)



■ Belgium — Surgical centers

Table 9. Median time between **confirmed** diagnosis of **adenocarcinoma** and start of first treatment in the six convention years.

Belgium				
Characteristic	N	Median (days)	IQR*	P90**
Operated patients with confirmed adenocarcinoma	2,221	25.0	[15, 38]	56.0
Convention year				
Year 1	336	21.0	[12, 37]	56.7
Year 2	364	24.5	[14, 36]	56.0
Year 3	367	27.0	[15, 37]	54.6
Year 4	362	24.0	[14, 35]	50.9
Year 5	386	26.0	[18, 40]	55.0
Year 6	406	27.0	[16, 42]	61.0
Referral status				
Operated patients referred to an expert centre	1,317	26.0	[15, 39]	57.8
Operated patients without referral	904	24.0	[14, 35]	53.0

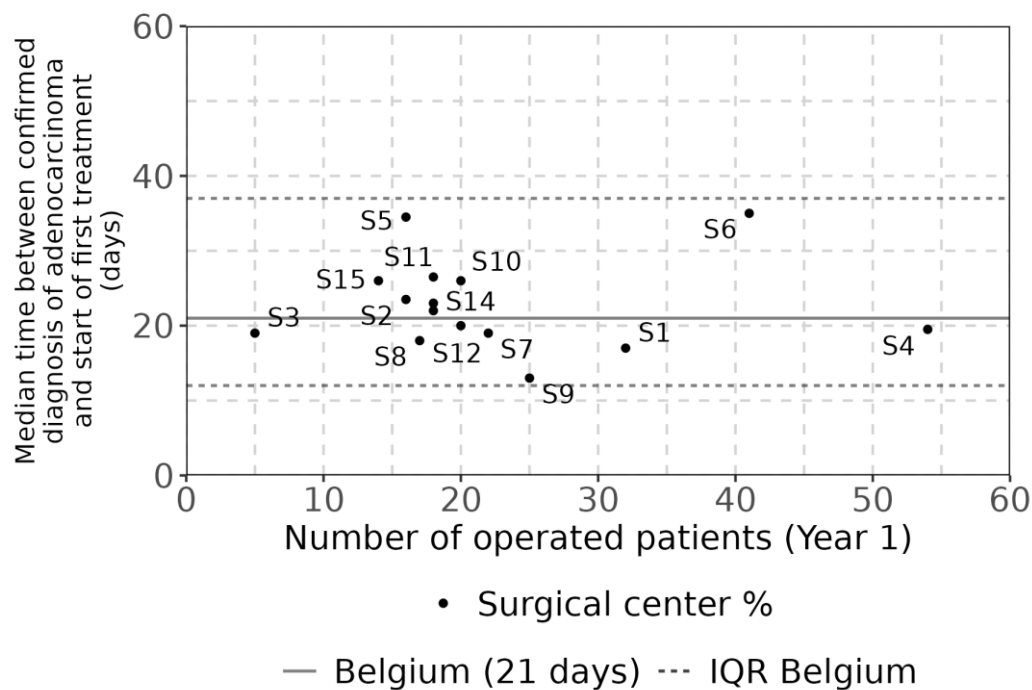
Remark: only operated patients with a histologically confirmed diagnosis are shown in this table.

*: Interquartile Range= [the 25th, and 75th percentiles of the data]

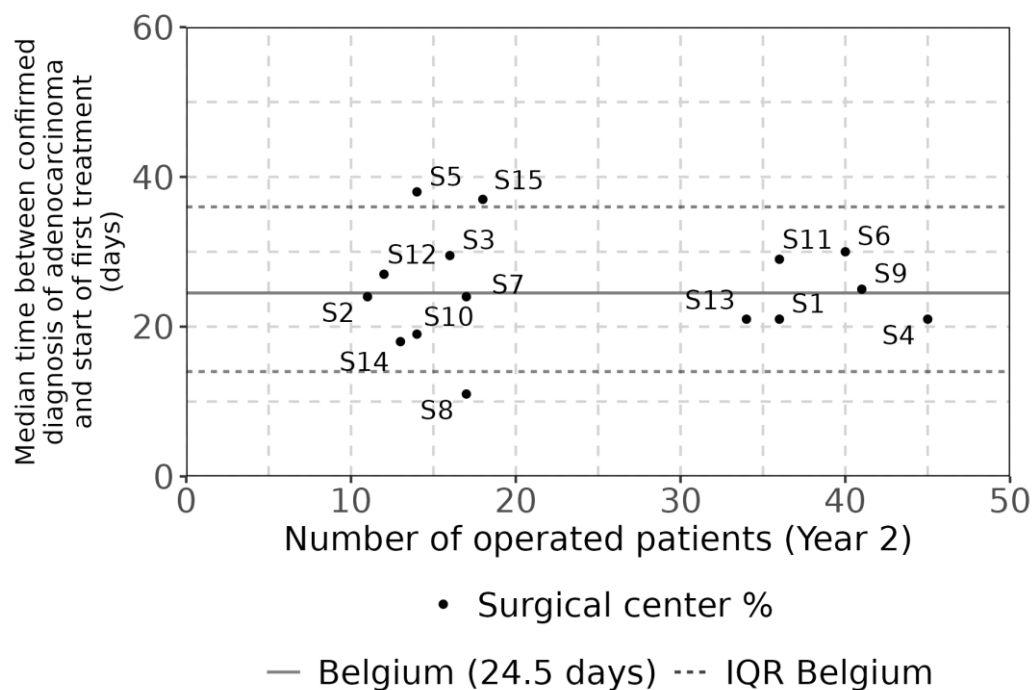
**: 90th percentile

Figure 11. Median time between confirmed diagnosis of adenocarcinoma and start of first treatment, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 (f) year 6 and (g) all years combined.

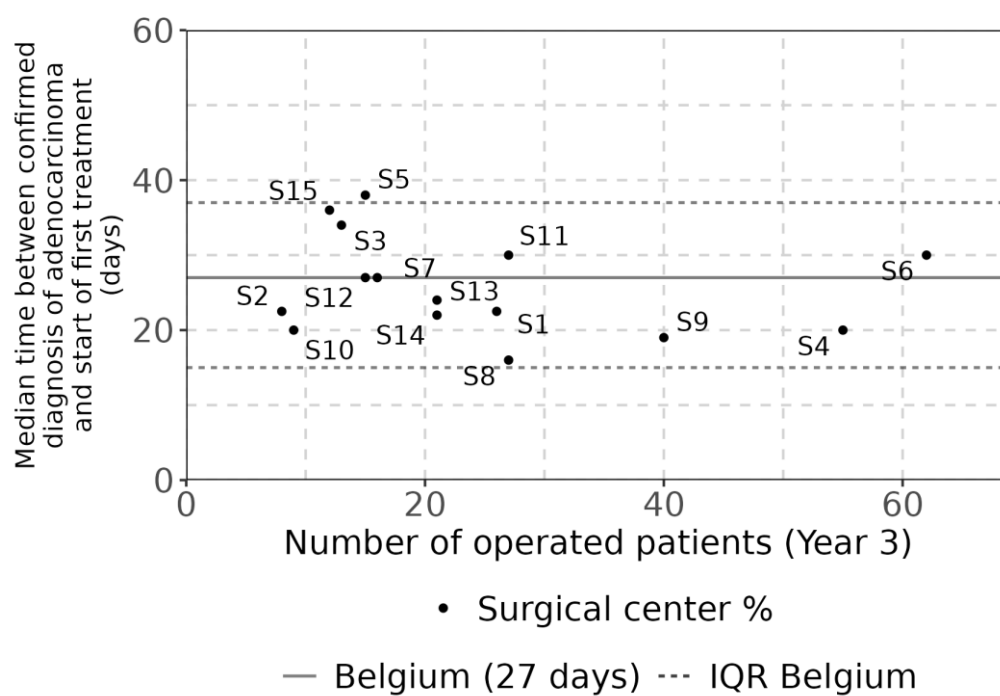
a)



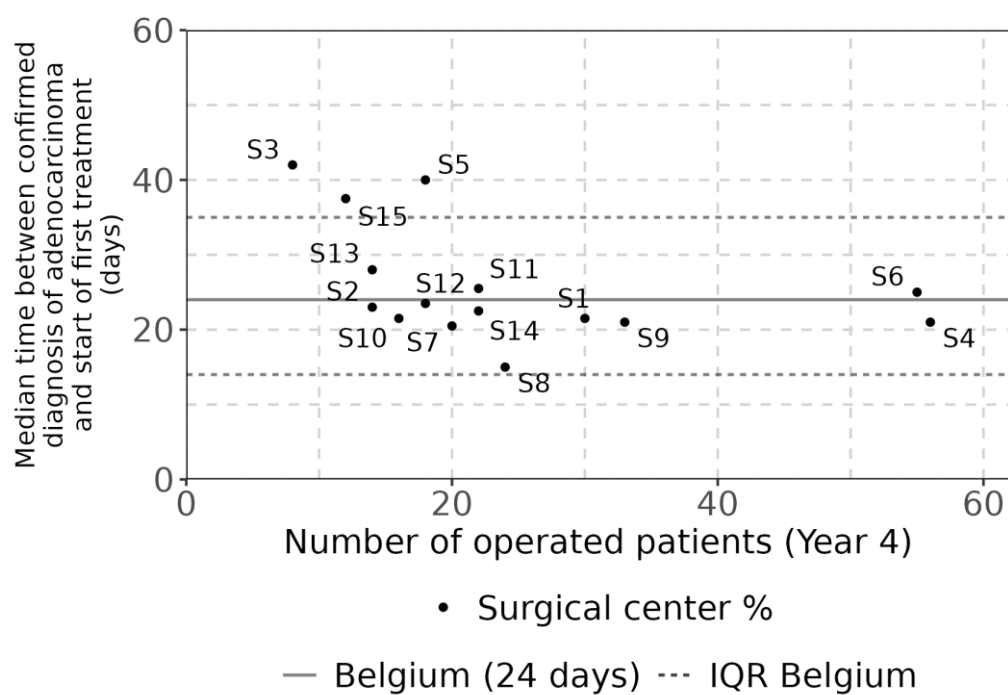
b)



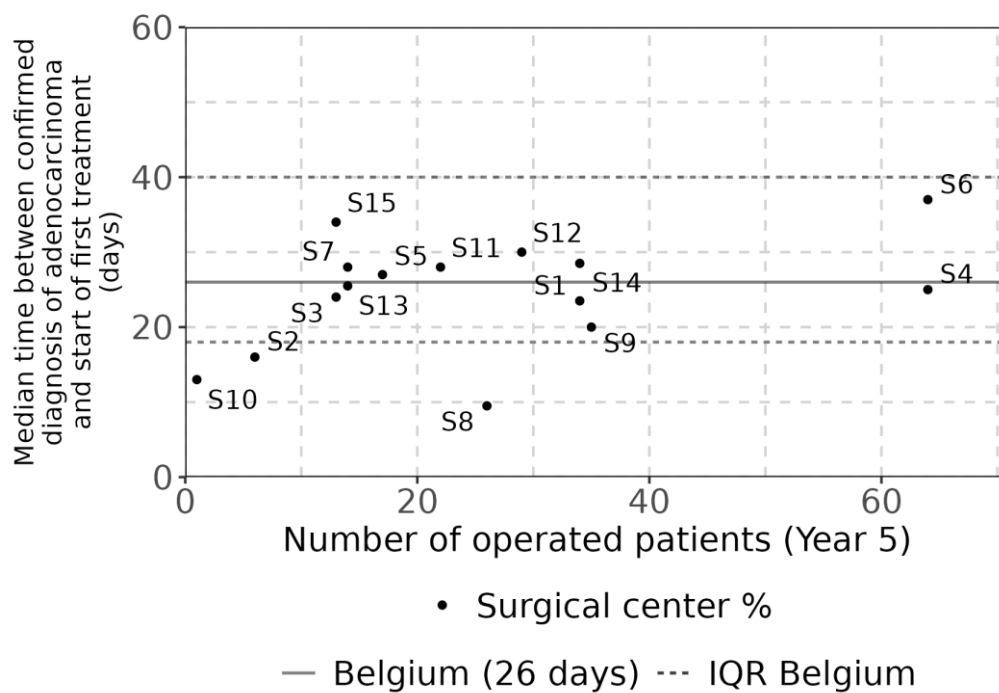
c)



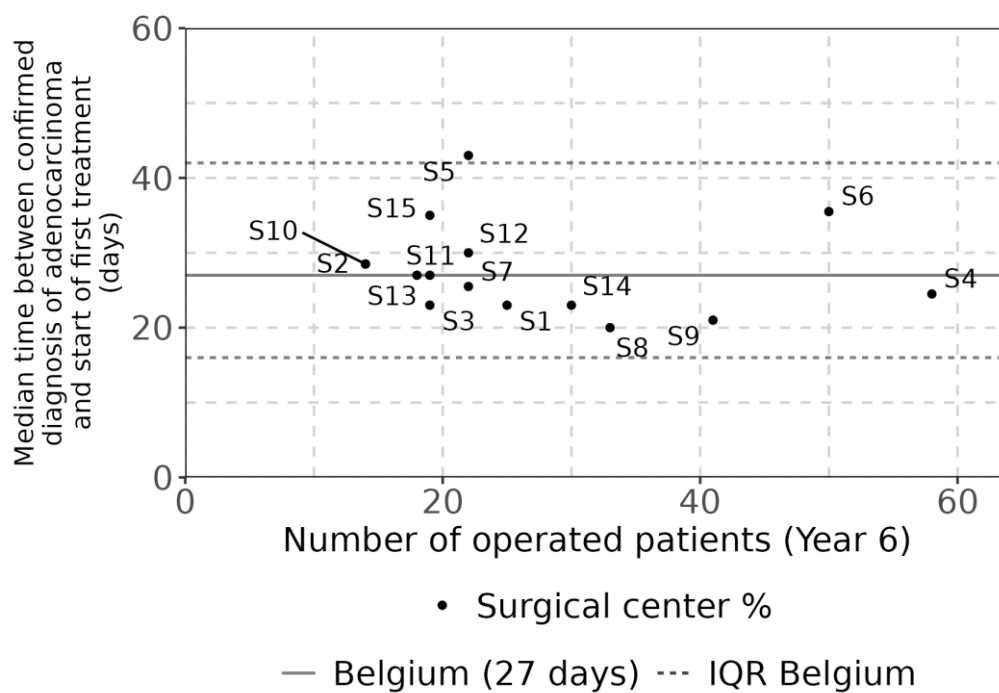
d)



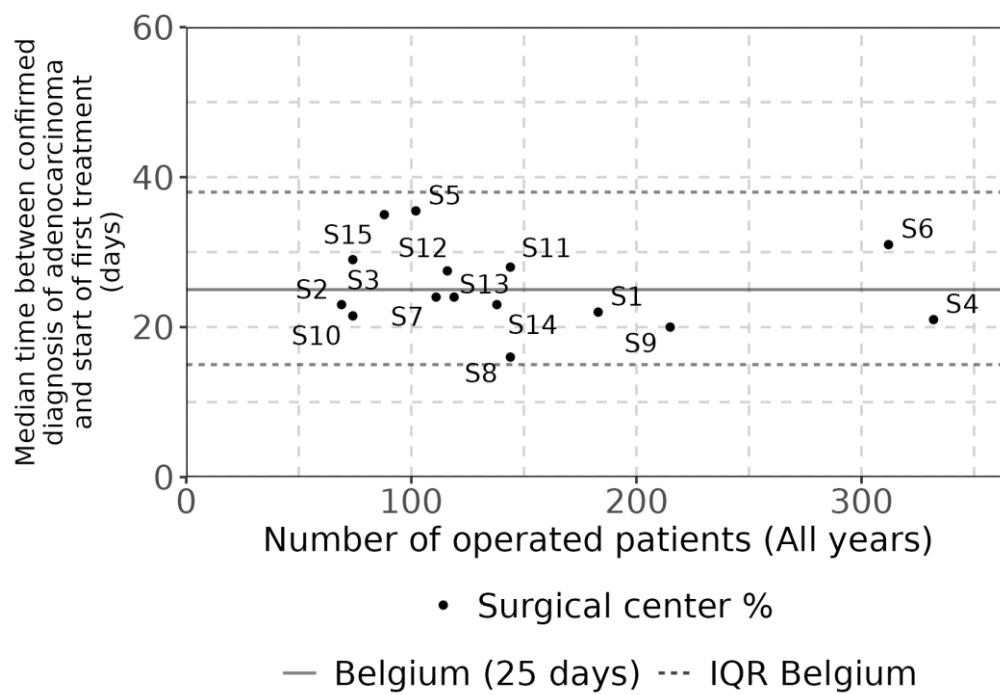
e)



f)



g)



3.2.2. Length of stay in the expert centre for all operated patients

Table 10. Length of stay in an expert centre for all operated patients (**malignant and benign tumours**) in the six convention years.

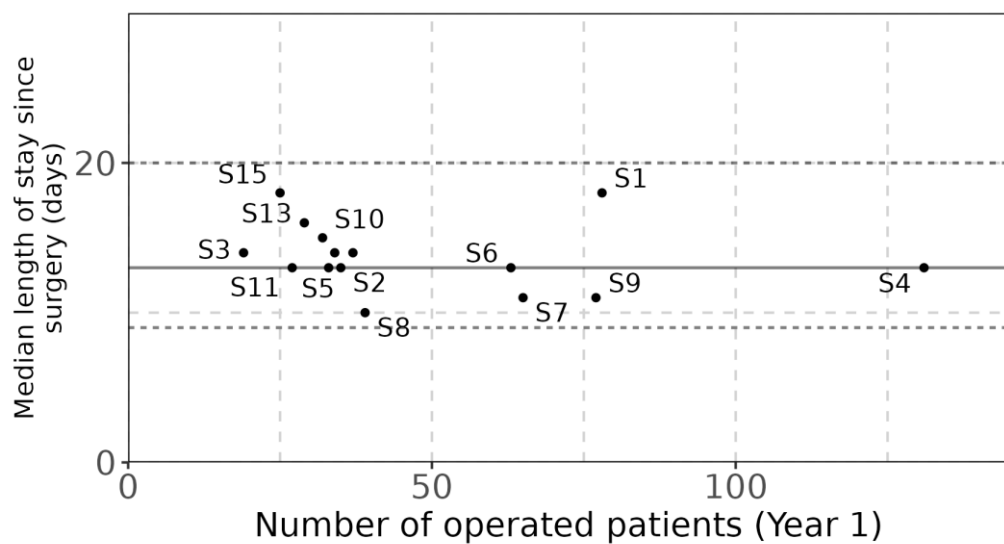
Characteristic	N	Belgium	
		Median (days)	IQR**
Operated patients with malignant/benign tumours *	5,071	12	[9, 18]
Type of surgery			
242830-242841: Pancreaticoduodenectomy	3,337	14	[10, 21]
Pancreaticoduodenectomy	3,012	14	[10, 21]
Total Pancreatectomy	324	15	[11, 22]
Missing	1	31	[31, 31]
242874-242885: Hemipancreatectomy left	1,202	8	[7, 11]
242896-242900: Enucleation of a pancreatic tumour	76	7	[6, 10]
Convention year			
Year 1	724	13	[9, 20]
Year 2	856	12	[8, 19]
Year 3	851	12	[8, 17]
Year 4	834	12	[8, 18]
Year 5	913	12	[8, 18]
Year 6	893	12	[8, 18]

*: length of stay longer than 90 days was truncated at 90 days.

**: Interquartile Range= [the 25th, and 75th percentiles of the data]

Figure 12. Median length of stay for all operated patients (**malignant and benign tumours**), per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 (f) year 6 and (g) all years combined.

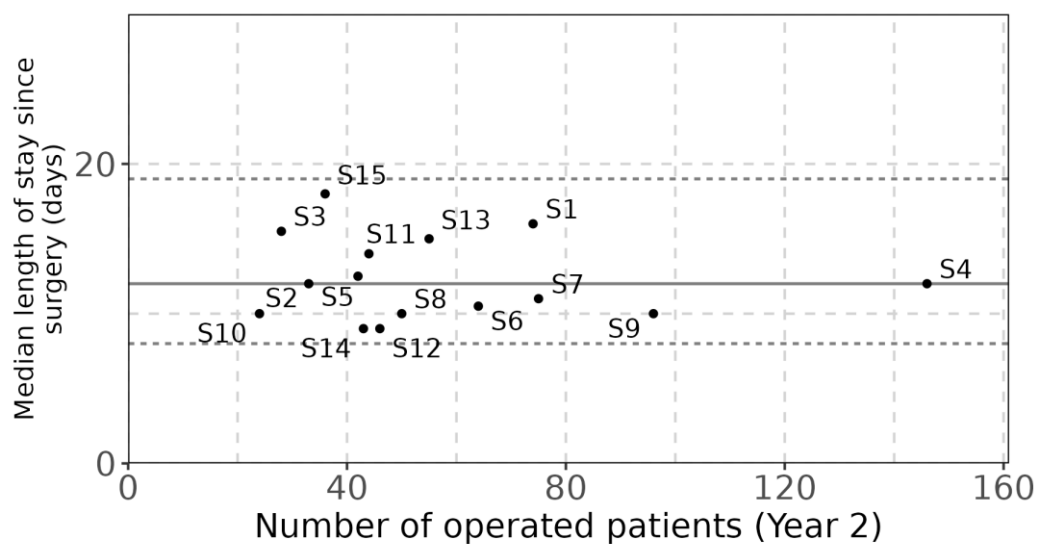
a)



• Surgical center %

— Belgium (13 days) --- IQR Belgium

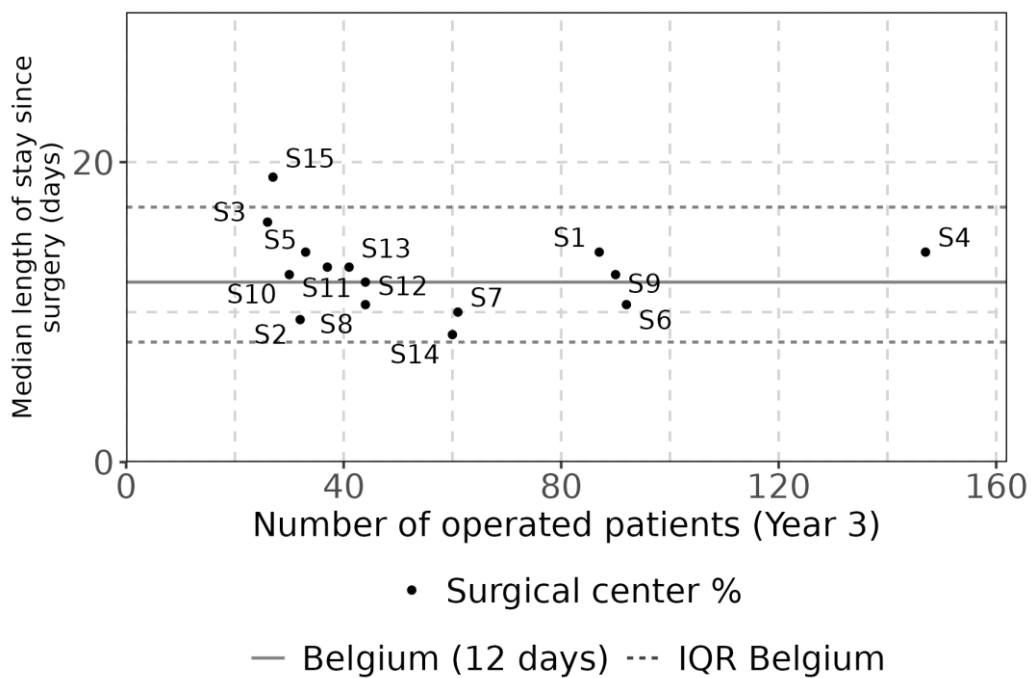
b)



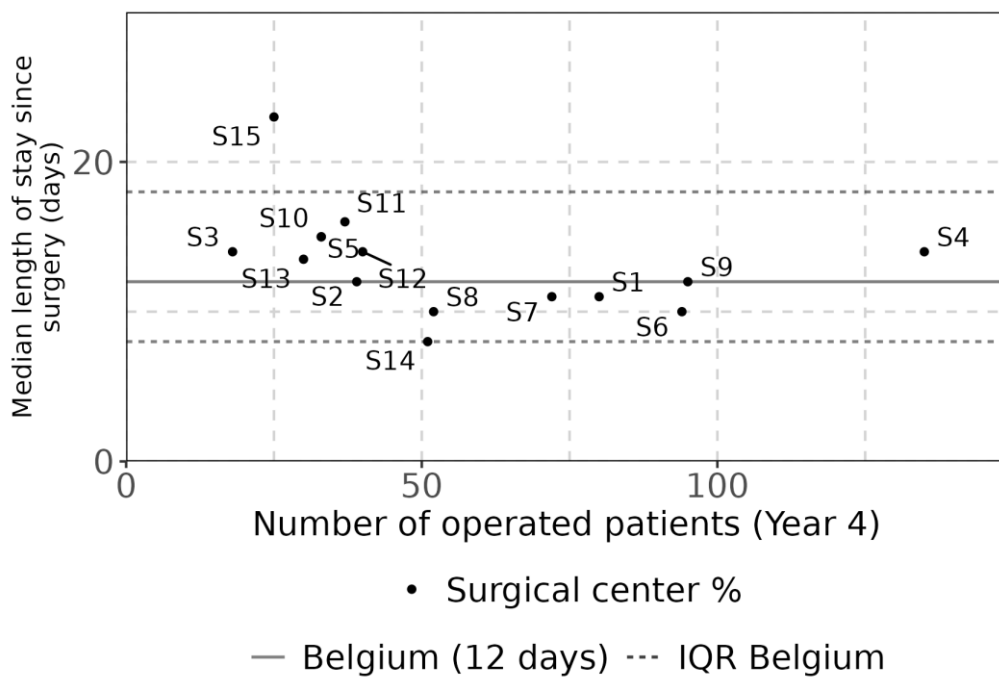
• Surgical center %

— Belgium (12 days) --- IQR Belgium

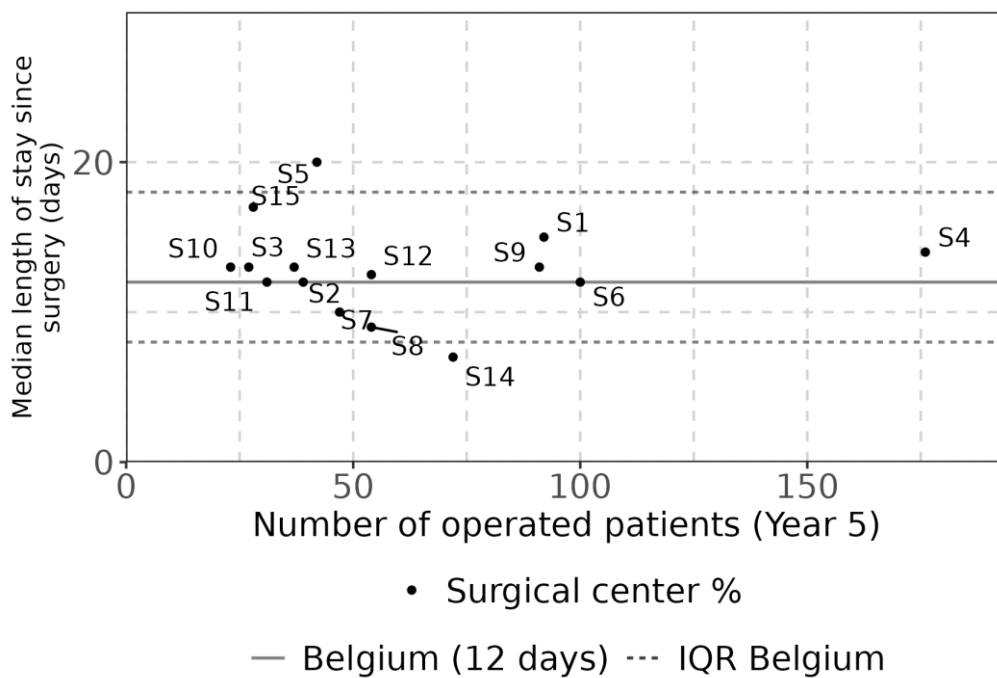
c)



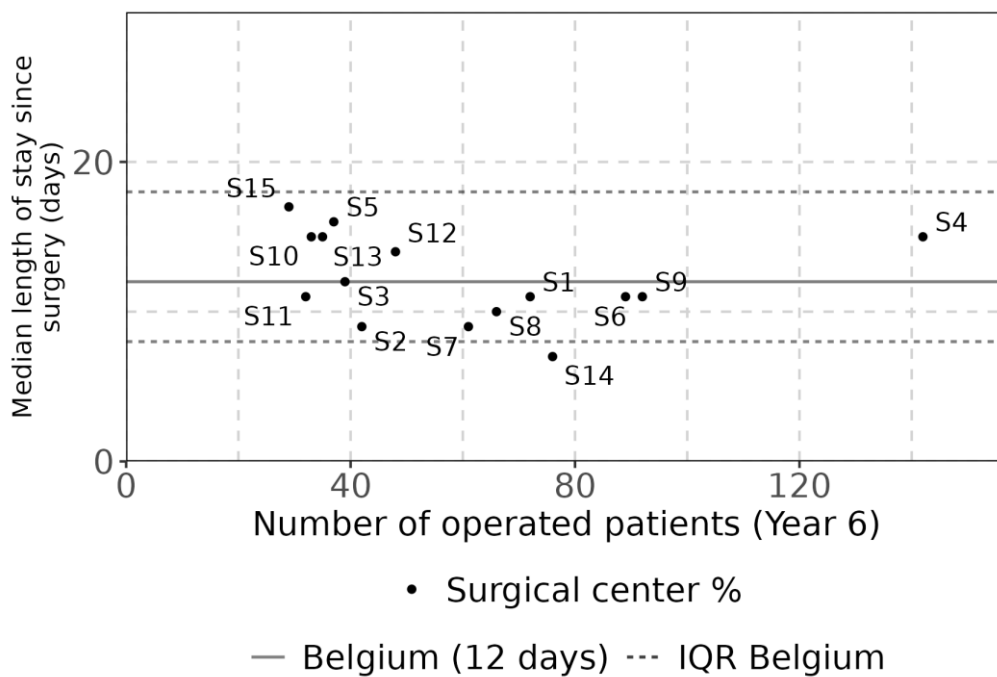
d)



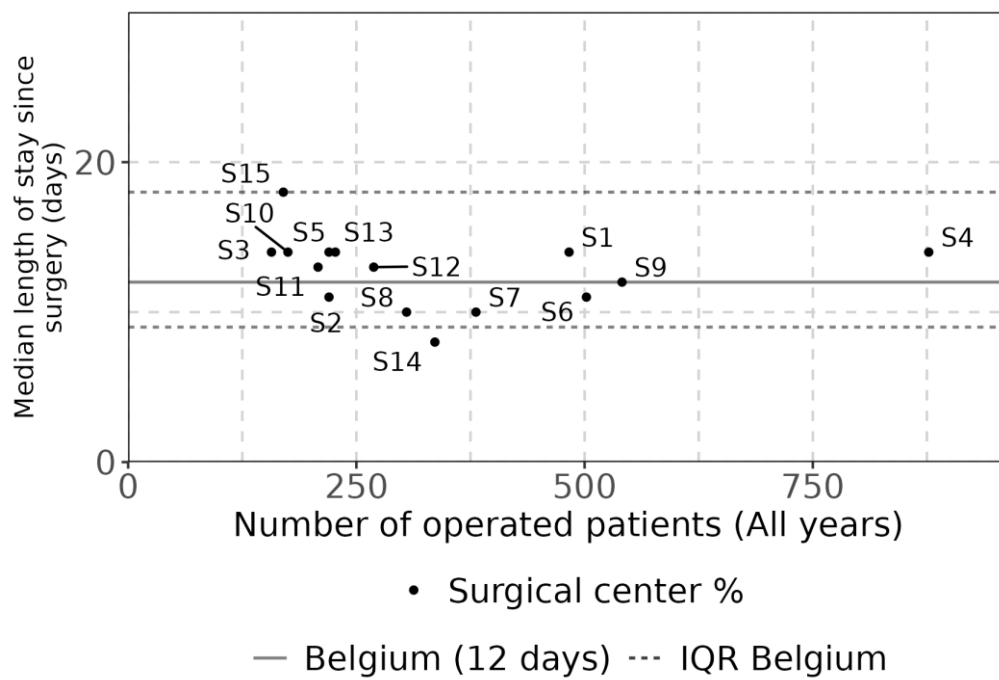
e)



f)



g)



3.2.3. Proportion of operated patients with ≥ 12 lymph nodes examined

Table 11. Proportion of operated patients with a **malignant tumour** in the six convention years for whom ≥ 12 lymph nodes were examined, by malignant morphology.

Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Operated patients with a malignant tumour	4360	3528	80.9	[79.7, 82.1]
Malignant morphology				
Adenocarcinoma	3271	2930	89.6	[88.5, 90.6]
Neuroendocrine tumour	672	321	47.8	[43.9, 51.6]
Other or unspecified	417	277	66.4	[61.7, 70.9]

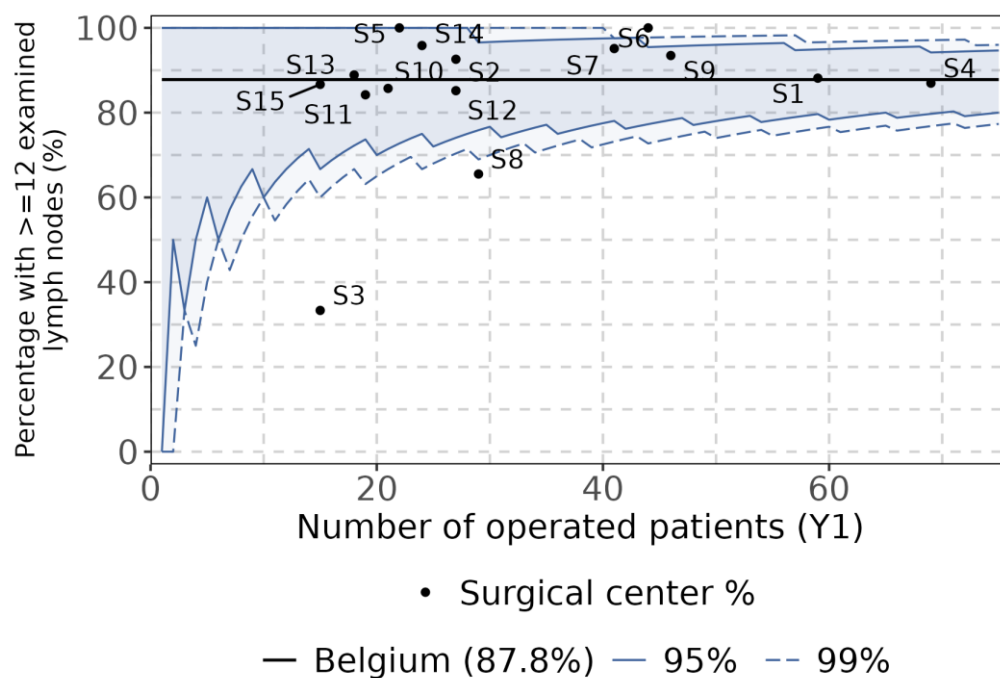
Table 12. Proportion of operated patients with **adenocarcinoma** in the six convention years for whom ≥ 12 lymph nodes were examined, by type of complex surgery.

Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Operated patients with adenocarcinoma	3271	2930	89.6	[88.5, 90.6]
Expert centers				
S1	343	325	94.8	[91.8, 96.9]
S2	134	132	98.5	[94.7, 99.8]
S3	113	79	69.9	[60.6, 78.2]
S4	531	411	77.4	[73.6, 80.9]
S5	131	122	93.1	[87.4, 96.8]
S6	343	318	92.7	[89.4, 95.2]
S7	232	219	94.4	[90.6, 97.0]
S8	205	166	81.0	[74.9, 86.1]
S9	348	330	94.8	[91.9, 96.9]
S10	107	96	89.7	[82.3, 94.8]
S11	148	138	93.2	[87.9, 96.7]
S12	171	159	93.0	[88.1, 96.3]
S13	147	131	89.1	[82.9, 93.6]
S14	212	209	98.6	[95.9, 99.7]
S15	106	95	89.6	[82.2, 94.7]
Convention year				
Year 1	476	418	87.8	[84.5, 90.6]
Year 2	554	487	87.9	[84.9, 90.5]
Year 3	552	503	91.1	[88.4, 93.4]
Year 4	545	498	91.4	[88.7, 93.6]
Year 5	579	534	92.2	[89.7, 94.3]
Year 6	565	490	86.7	[83.6, 89.4]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	2588	2384	92.1	[91.0, 93.1]
Pancreaticoduodenectomy	2389	2197	92.0	[90.8, 93.0]

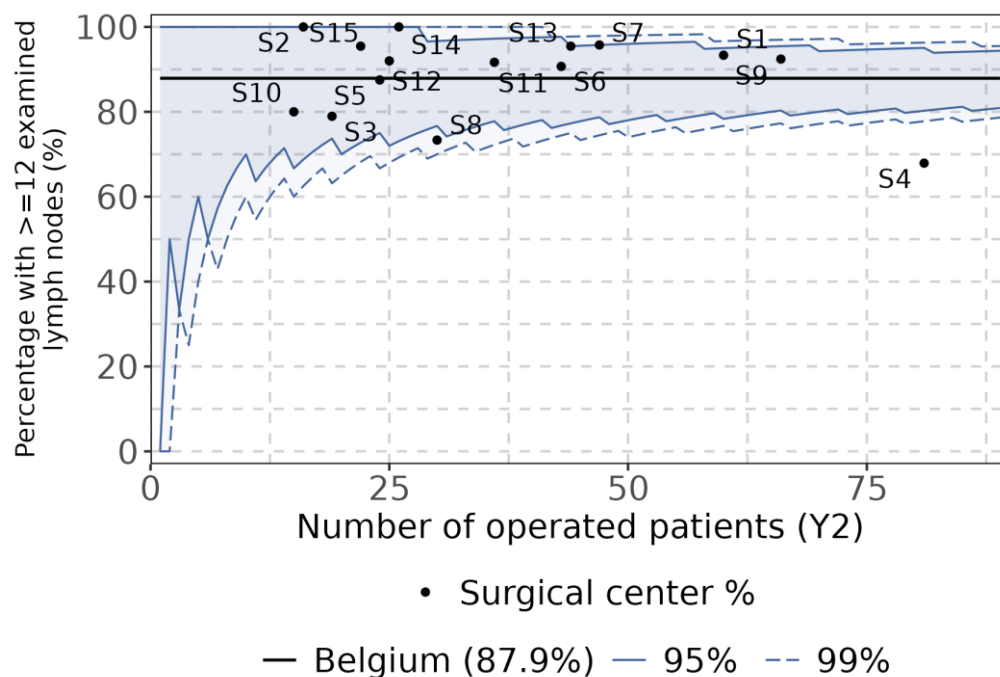
Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Total Pancreatectomy	199	187	94.0	[89.7, 96.8]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	210	168	80.0	[73.9, 85.2]
242874-242885: Hemipancreatectomy left	470	376	80.0	[76.1, 83.5]
242896-242900: Enucleation of a pancreatic tumour	3	2	66.7	[9.4, 99.2]

Figure 13. Funnel and spaghetti plot of the proportion of operated patients with **adenocarcinoma** for whom ≥ 12 lymph nodes were examined, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

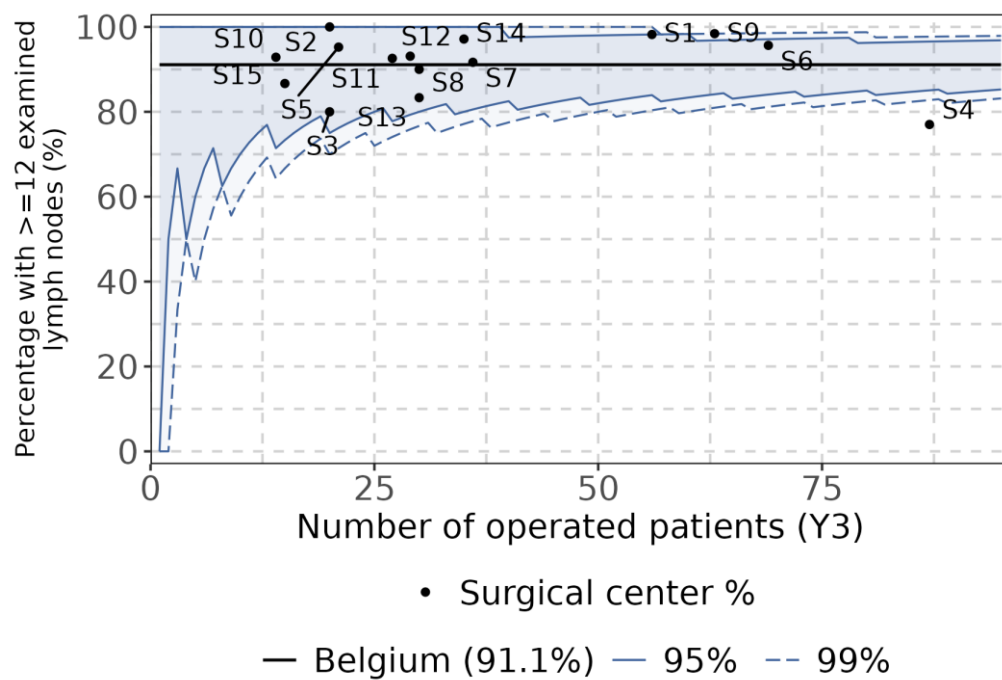
a)



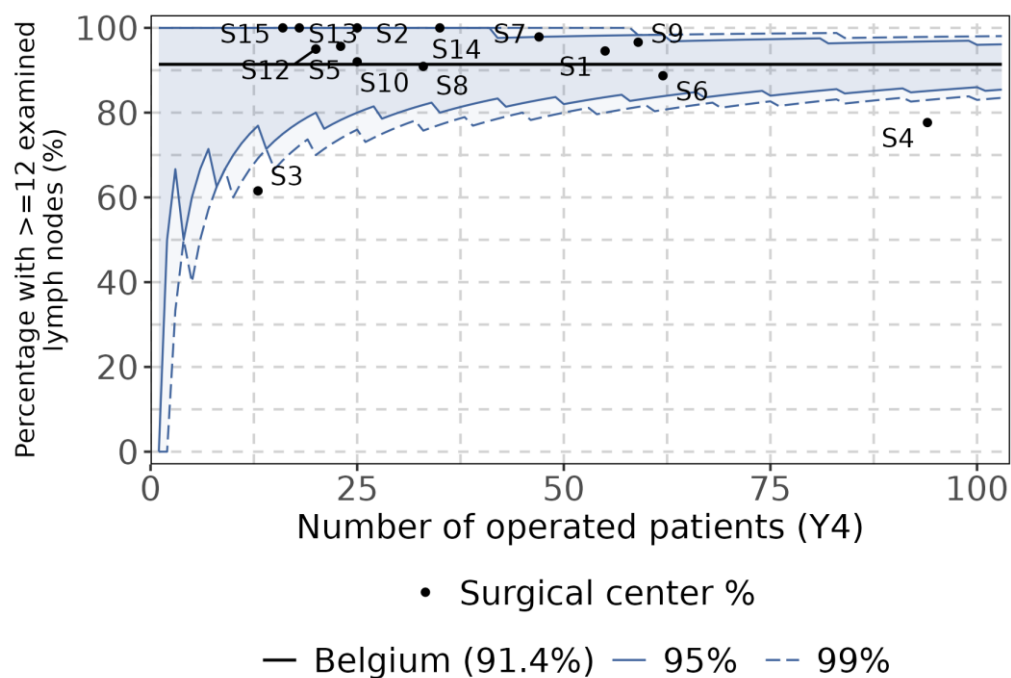
b)



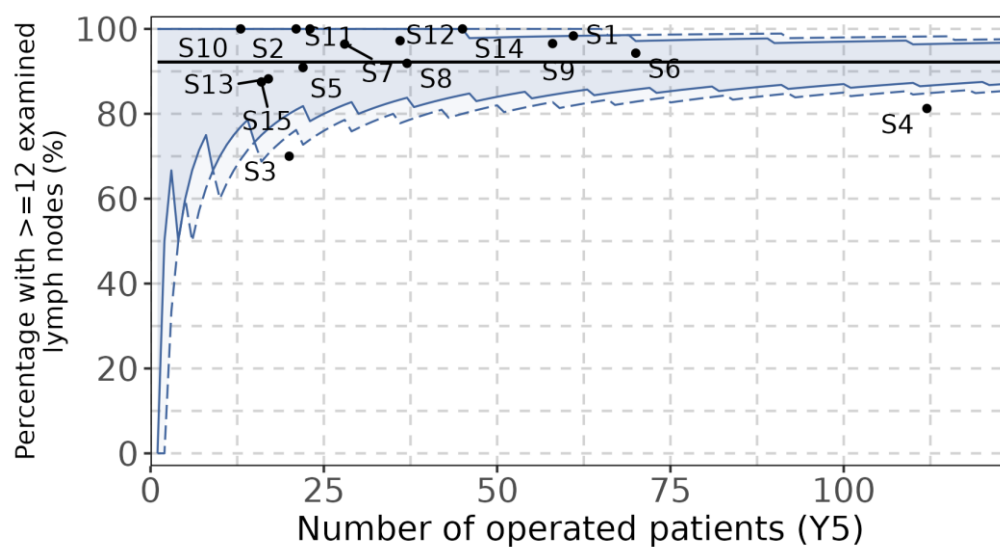
c)



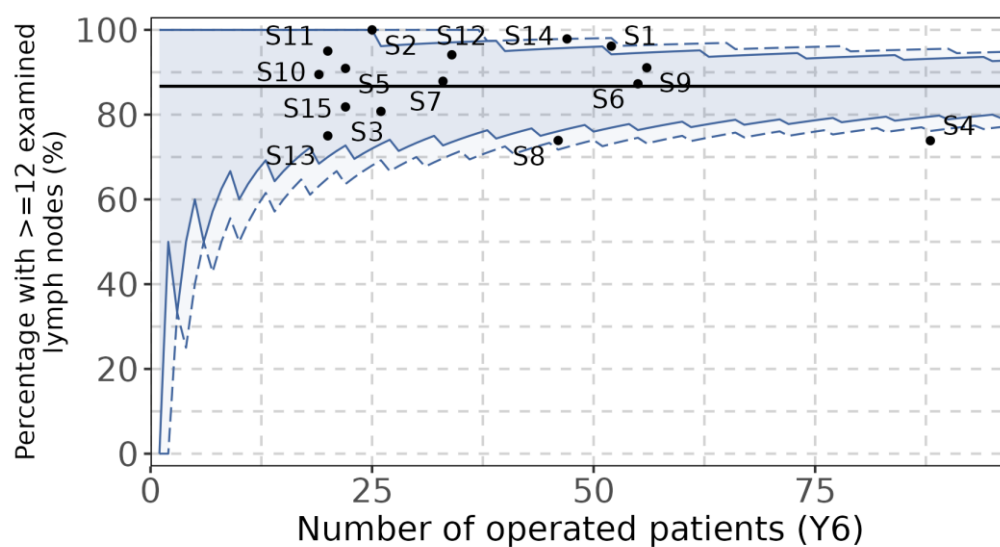
d)



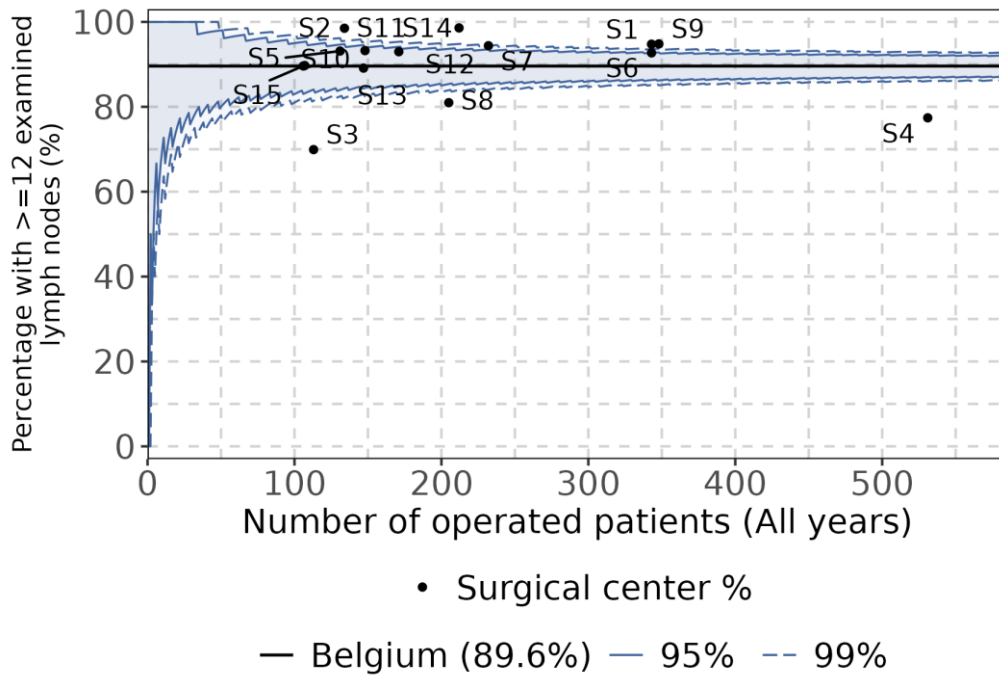
e)



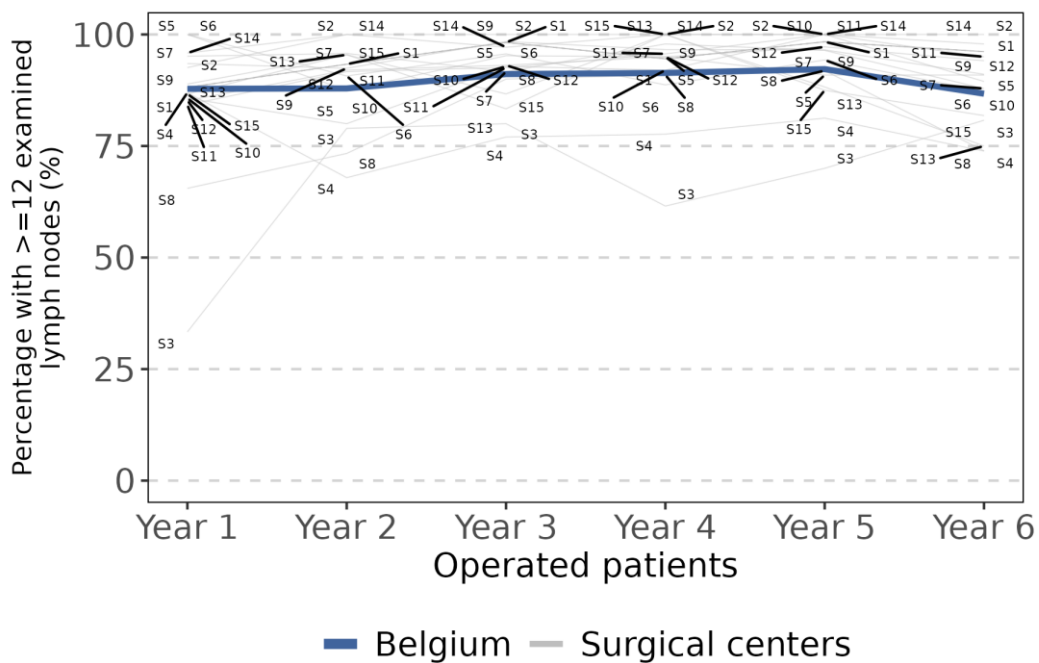
f)



g)



h)



3.3. Outcome indicators

3.3.1. Postoperative mortality

3.3.1.1. Unadjusted 30-day postoperative mortality

Table 13. Unadjusted 30-day postoperative mortality for **malignant and benign tumoural** pathology in the six convention years, by patient and tumour characteristics.

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Operated patients with a malignant/benign tumour	5,071	103	2.0	[1.7, 2.5]
Expert centers				
S1	483	13	2.7	[1.4, 4.6]
S2	220	3	1.4	[0.3, 3.9]
S3	157	5	3.2	[1.0, 7.3]
S4	877	16	1.8	[1.0, 2.9]
S5	220	7	3.2	[1.3, 6.4]
S6	502	15	3.0	[1.7, 4.9]
S7	381	1	0.3	[0.0, 1.5]
S8	305	4	1.3	[0.4, 3.3]
S9	541	4	0.7	[0.2, 1.9]
S10	175	1	0.6	[0.0, 3.1]
S11	208	12	5.8	[3.0, 9.9]
S12	269	4	1.5	[0.4, 3.8]
S13	227	5	2.2	[0.7, 5.1]
S14	336	11	3.3	[1.6, 5.8]
S15	170	2	1.2	[0.1, 4.2]
Convention year				
Year 1	724	18	2.5	[1.5, 3.9]
Year 2	856	19	2.2	[1.3, 3.4]
Year 3	851	22	2.6	[1.6, 3.9]
Year 4	834	13	1.6	[0.8, 2.7]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Year 5	913	14	1.5	[0.8, 2.6]
Year 6	893	17	1.9	[1.1, 3.0]
Sex				
Female	2,364	39	1.6	[1.2, 2.2]
Male	2,707	64	2.4	[1.8, 3.0]
Age at surgery				
<=69	2,835	39	1.4	[1.0, 1.9]
70-79	1,760	47	2.7	[2.0, 3.5]
>=80	476	17	3.6	[2.1, 5.7]
Lesion to treat (in (peri-)pancreas)				
Metastasis	70	1	1.4	[0.0, 7.7]
Missing	2	0	0.0	[0.0, 84.2]
Primary tumour	4,935	100	2.0	[1.7, 2.5]
Relapse of primary tumour	64	2	3.1	[0.4, 10.8]
Morphology				
Adenocarcinoma	3,271	81	2.5	[2.0, 3.1]
Benign tumour	711	7	1.0	[0.4, 2.0]
Neuroendocrine tumour	672	7	1.0	[0.4, 2.1]
Other or unspecified	417	8	1.9	[0.8, 3.7]
Primary tumour localisation				
C17.0 Duodenum	224	8	3.6	[1.6, 6.9]
C24.0 Extrahepatic bile duct	252	7	2.8	[1.1, 5.6]
C24.1 (Peri-) ampullary region	424	14	3.3	[1.8, 5.5]
C25.0 Head of pancreas	1,908	46	2.4	[1.8, 3.2]
C25.1 Body of pancreas	441	5	1.1	[0.4, 2.6]
C25.2 Tail of pancreas	699	4	0.6	[0.2, 1.5]
C25.3 Pancreatic duct	19	0	0.0	[0.0, 17.6]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
C25.4 Islands of Langerhans	35	0	0.0	[0.0, 10.0]
C25.7-9 Other specified parts of pancreas	219	9	4.1	[1.9, 7.7]
Missing or benign	713	7	1.0	[0.4, 2.0]
Other	137	3	2.2	[0.5, 6.3]
Clinical stage				
0	111	0	0.0	[0.0, 3.3]
I	2,134	52	2.4	[1.8, 3.2]
II	1,196	23	1.9	[1.2, 2.9]
III	448	10	2.2	[1.1, 4.1]
IV	113	0	0.0	[0.0, 3.2]
X	235	9	3.8	[1.8, 7.1]
TNM not applicable or relapse*	834	9	1.1	[0.5, 2.0]
Prior surgery or other treatment **				
Prior abdominal surgery	749	20	2.7	[1.6, 4.1]
Other treatment modality (that could affect the pancreas)	689	17	2.5	[1.4, 3.9]
Neoadjuvant treatment				
Chemoradiotherapy	102	2	2.0	[0.2, 6.9]
Chemotherapy	706	7	1.0	[0.4, 2.0]
Radiotherapy	4	0	0.0	[0.0, 60.2]
No chemo or radiation treatment	4,259	94	2.2	[1.8, 2.7]
Charlson Comorbidity Index				
0	2,118	20	0.9	[0.6, 1.5]
1	1,226	34	2.8	[1.9, 3.9]
2	810	22	2.7	[1.7, 4.1]
3	403	11	2.7	[1.4, 4.8]
4	233	5	2.1	[0.7, 4.9]
5	105	3	2.9	[0.6, 8.1]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
6	83	4	4.8	[1.3, 11.9]
7	44	1	2.3	[0.1, 12.0]
8	30	2	6.7	[0.8, 22.1]
9	10	1	10.0	[0.3, 44.5]
10	5	0	0.0	[0.0, 52.2]
11	2	0	0.0	[0.0, 84.2]
12	2	0	0.0	[0.0, 84.2]
WHO score at surgery				
0 - Asymptomatic, normal activity	1,558	21	1.3	[0.8, 2.1]
1 - Symptomatic, but ambulant	2,946	62	2.1	[1.6, 2.7]
2 - Symptomatic, bedbound < 50% day	484	17	3.5	[2.1, 5.6]
3 - Symptomatic, bedbound > 50% day	80	3	3.8	[0.8, 10.6]
4 - Completely dependent, 100% bedbound	3	0	0.0	[0.0, 70.8]
ASA score				
1 - Healthy person	307	4	1.3	[0.4, 3.3]
2 - Mild systemic disease, normal activity	2,636	42	1.6	[1.2, 2.1]
3 - Serious systemic disease, limited activity	2,073	54	2.6	[2.0, 3.4]
4 - Life-threatening illness, handicapped	55	3	5.5	[1.1, 15.1]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	1,329	13	1.0	[0.5, 1.7]
Minimally invasive surgery (MIS) - Hybrid	5	0	0.0	[0.0, 52.2]
Minimally invasive surgery (MIS) - Robotic	712	13	1.8	[1.0, 3.1]
Open	2,785	66	2.4	[1.8, 3.0]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Conversion from MIS to open surgery	240	11	4.6	[2.3, 8.1]
Resectability status***				
Before neoadjuvant treatment				
Upfront resectable	147	1	0.7	[0.0, 3.7]
Borderline resectable	414	6	1.4	[0.5, 3.1]
Unresectable	91	2	2.2	[0.3, 7.7]
No neoadjuvant treatment	2,764	63	2.3	[1.8, 2.9]
Before surgery				
Upfront resectable	2,984	64	2.1	[1.7, 2.7]
Borderline resectable	431	7	1.6	[0.7, 3.3]
Unresectable	26	1	3.8	[0.1, 19.6]
Missing	7	0	0.0	[0.0, 41.0]
Simultaneous venous resection				
No	4,448	82	1.8	[1.5, 2.3]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	623	21	3.4	[2.1, 5.1]
With primary wedge-reconstruction	206	5	2.4	[0.8, 5.6]
With primary end-to-end reconstruction	251	11	4.4	[2.2, 7.7]
With vascular autograft interposition	15	0	0.0	[0.0, 21.8]
With vascular allograft interposition	78	2	2.6	[0.3, 9.0]
With synthetic/prosthetic interposition	12	2	16.7	[2.1, 48.4]
With peritoneal patch wedge-reconstruction	50	0	0.0	[0.0, 7.1]
Without reconstruction	11	1	9.1	[0.2, 41.3]
Simultaneous arterial resection**				

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
No	4,991	101	2.0	[1.7, 2.5]
Hepatic artery resection	33	1	3.0	[0.1, 15.8]
With primary wedge-reconstruction	0	0	0.0	-
With primary end-to-end reconstruction	20	0	0.0	[0.0, 16.8]
With vascular autograft interposition	1	0	0.0	[0.0, 97.5]
With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
With synthetic/prosthetic interposition	0	0	0.0	-
Without reconstruction	11	1	9.1	[0.2, 41.3]
Coeliac trunk resection	37	1	2.7	[0.1, 14.2]
With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
With primary end-to-end reconstruction	2	0	0.0	[0.0, 84.2]
With vascular autograft interposition	0	0	0.0	-
With vascular allograft interposition	0	0	0.0	-
With synthetic/prosthetic interposition	0	0	0.0	-
Without reconstruction	34	1	2.9	[0.1, 15.3]
Superior mesenteric artery (SMA) resection	9	0	0.0	[0.0, 33.6]
With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
With primary end-to-end reconstruction	3	0	0.0	[0.0, 70.8]
With vascular autograft interposition	2	0	0.0	[0.0, 84.2]
With vascular allograft interposition	0	0	0.0	-
With synthetic/prosthetic interposition	0	0	0.0	-

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Without reconstruction	3	0	0.0	[0.0, 70.8]
<i>Simultaneous other organ resection</i>				
**				
No	3,097	69	2.2	[1.7, 2.8]
Colon	125	6	4.8	[1.8, 10.2]
Stomach	698	21	3.0	[1.9, 4.6]
Adrenal gland	101	0	0.0	[0.0, 3.6]
Spleen	1,161	14	1.2	[0.7, 2.0]
Other	304	4	1.3	[0.4, 3.3]
<i>RIZIV code for complex surgery</i>				
242830-242841: Pancreaticoduodenectomy	3,337	87	2.6	[2.1, 3.2]
Pancreaticoduodenectomy	3,012	79	2.6	[2.1, 3.3]
Total Pancreatectomy	324	8	2.5	[1.1, 4.8]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	456	6	1.3	[0.5, 2.8]
242874-242885: Hemipancreatectomy left	1,202	9	0.7	[0.3, 1.4]
242896-242900: Enucleation of a pancreatic tumour	76	1	1.3	[0.0, 7.1]
<i>Antithrombotic medication</i>				
No	3,578	53	1.5	[1.1, 1.9]
Yes	1,493	50	3.3	[2.5, 4.4]
<i>Was the patient referred?</i>				
No	2,328	42	1.8	[1.3, 2.4]
Yes	2,743	61	2.2	[1.7, 2.8]

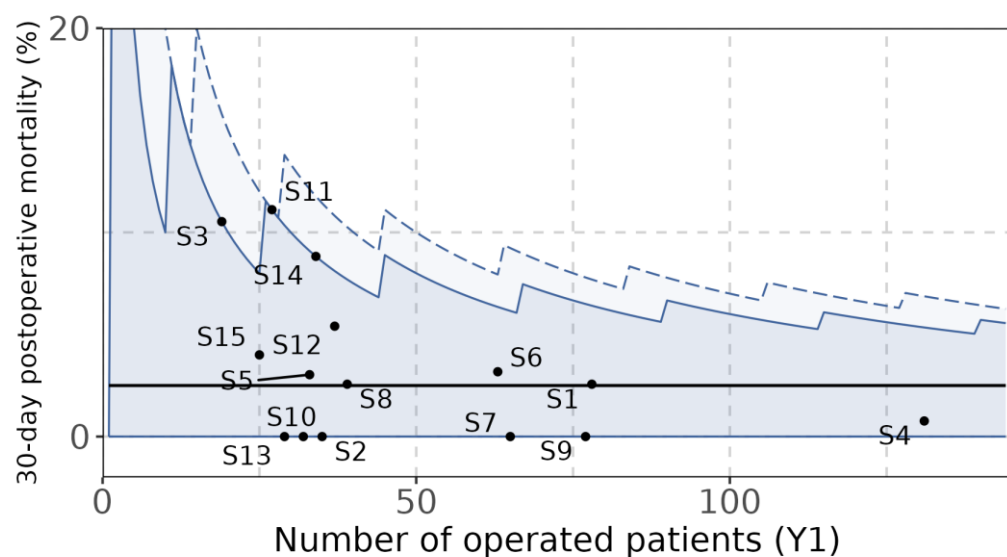
*: Tumour staging not possible.

**.: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

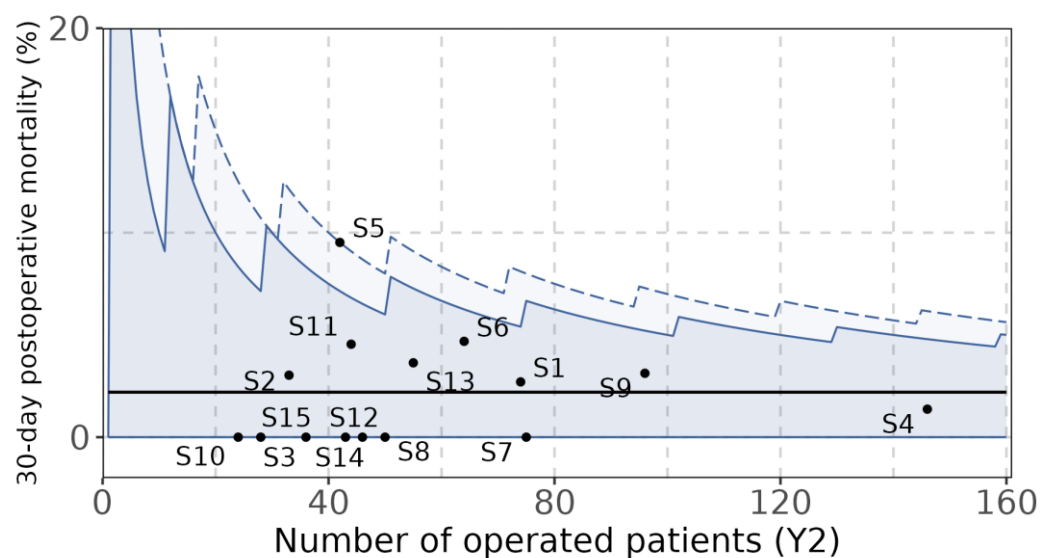
****: Results for this variable are only for malignant tumours and only available from the second half of Y2 onwards.*

Figure 14. Funnel and spaghetti plot of the unadjusted 30-day postoperative mortality for **malignant and benign tumoural pathology**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

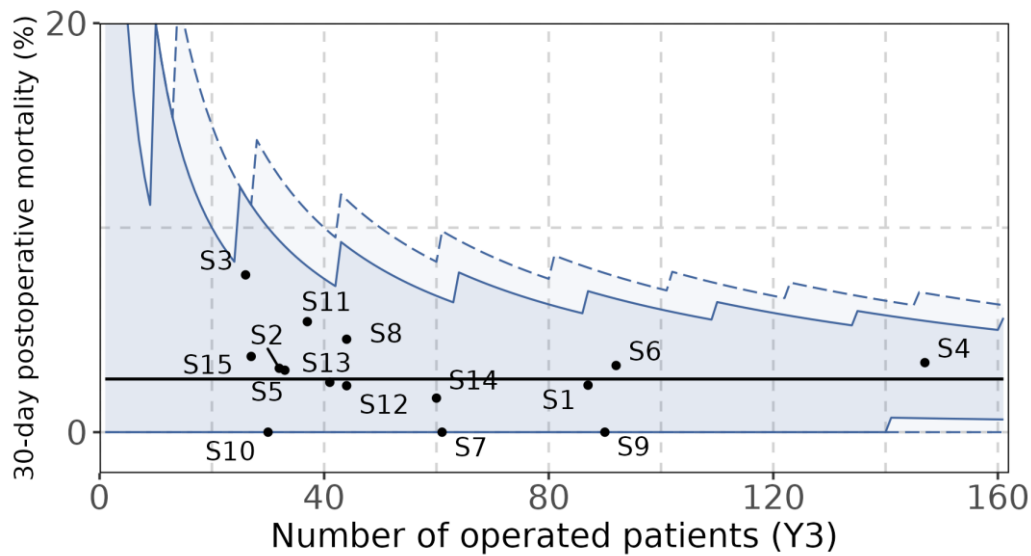
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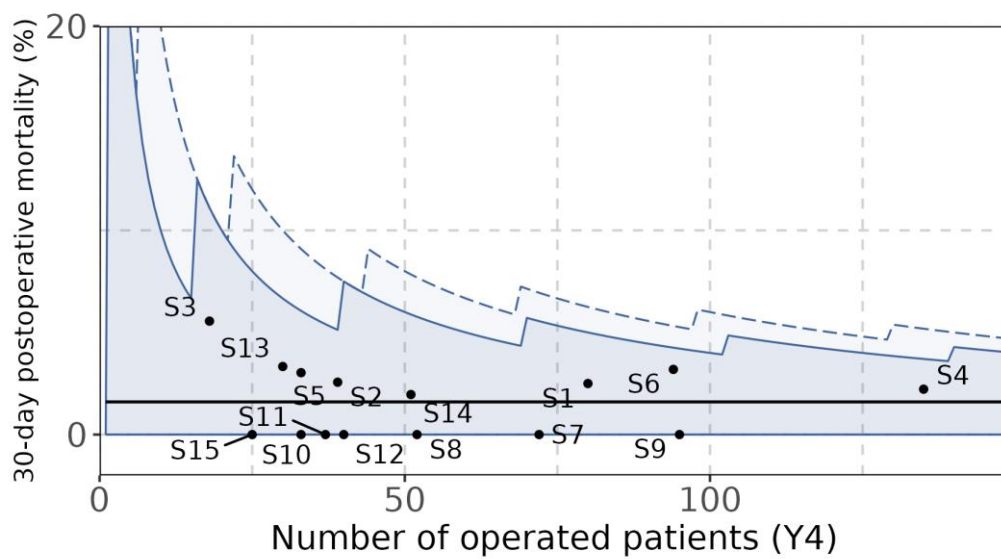
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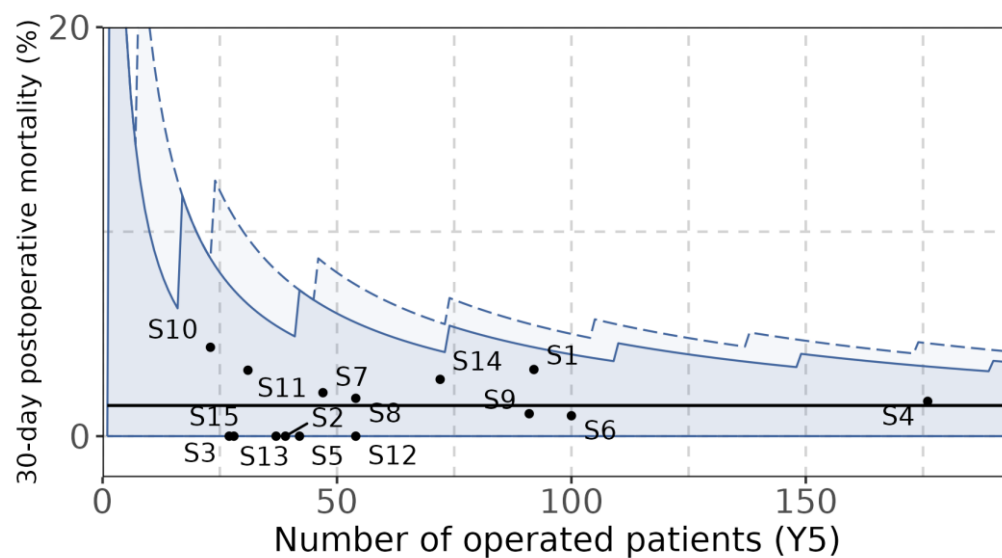
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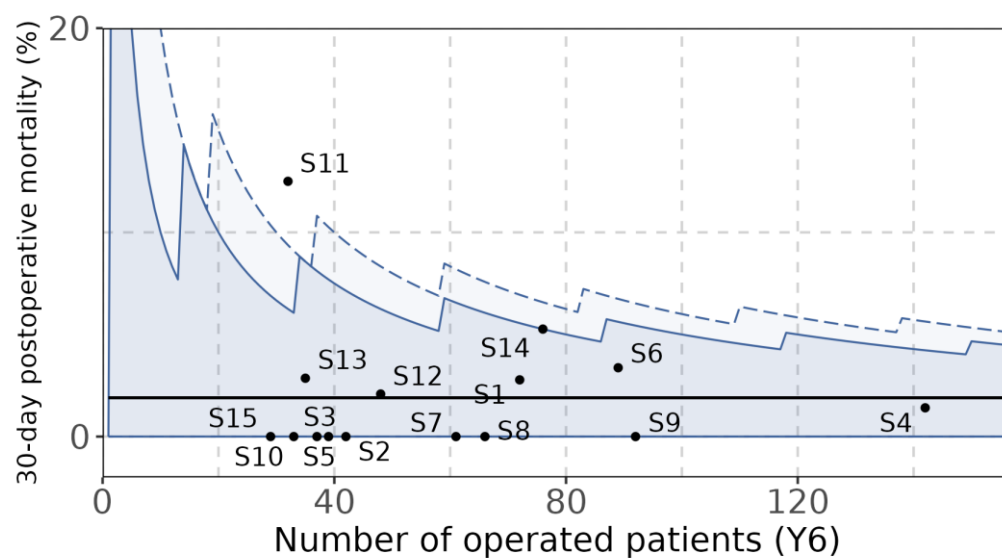
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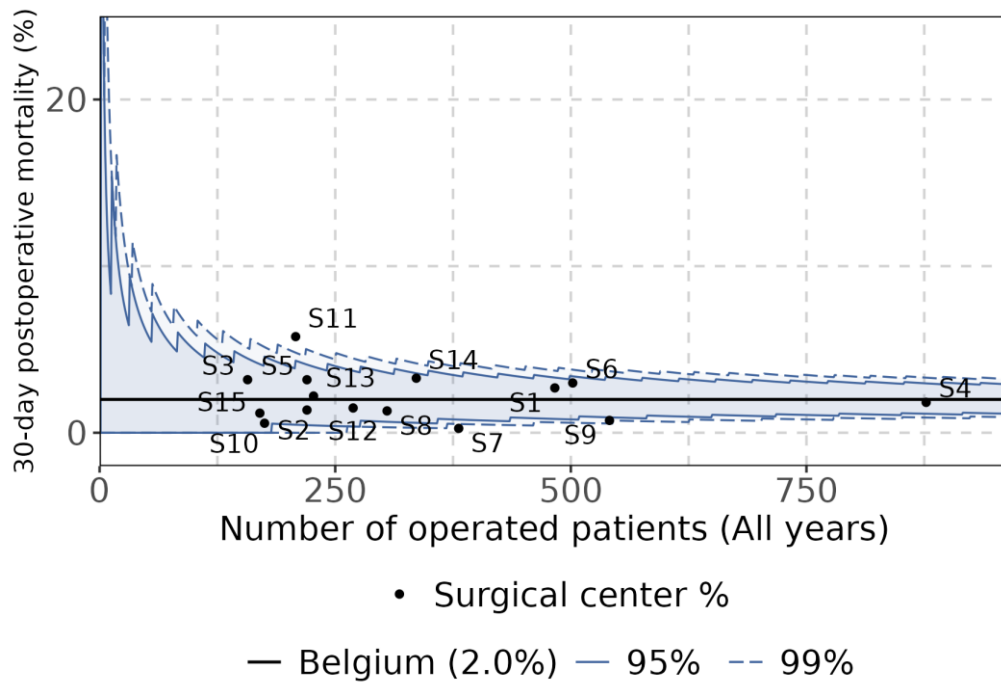
e)



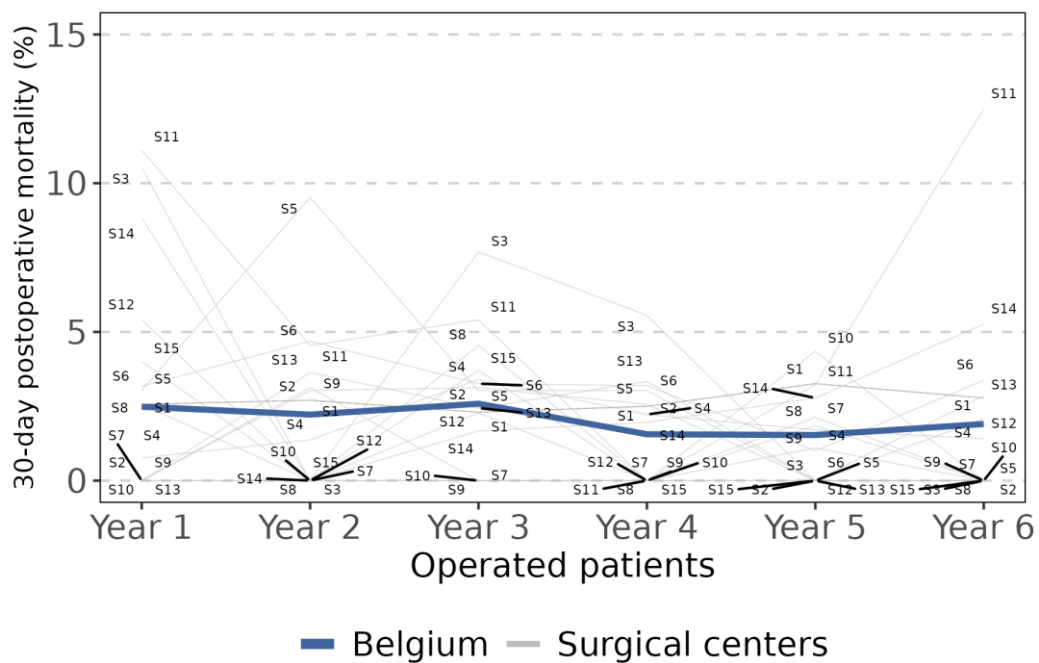
f)



g)



h)



3.3.1.2. Adjusted 30-day postoperative mortality

Table 14. Case-mix adjusted odds ratio for postoperative mortality within 30 days and direct standardised 30-day postoperative mortality, for **malignant and benign tumoural** pathology, in the six convention years.

Expert centers	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	1.70	[0.93, 3.11]	1.02	2.7	[1.6, 4.7]	2.1
S2	0.87	[0.29, 2.64]	1.02	1.4	[0.5, 4.3]	2.1
S3	1.71	[0.70, 4.16]	1.02	2.7	[1.1, 6.5]	2.1
S4	1.52	[0.77, 3.01]	1.02	2.4	[1.4, 4.3]	2.1
S5	2.27	[1.04, 4.92]	1.02	3.6	[1.7, 7.4]	2.1
S6	1.90	[1.07, 3.37]	1.02	3.0	[1.8, 5.0]	2.1
S7	0.13	[0.02, 0.84]	1.02	0.2	[0.0, 1.6]	2.1
S8	0.87	[0.32, 2.32]	1.02	1.4	[0.6, 3.5]	2.1
S9	0.42	[0.16, 1.11]	1.02	0.7	[0.3, 1.9]	2.1
S10	0.28	[0.04, 1.84]	1.02	0.5	[0.1, 3.4]	2.1
S11	3.31	[1.75, 6.25]	1.02	5.1	[2.9, 8.8]	2.1
S12	0.82	[0.31, 2.19]	1.02	1.3	[0.5, 3.5]	2.1
S13	1.32	[0.55, 3.18]	1.02	2.1	[0.9, 4.9]	2.1
S14	2.09	[1.06, 4.13]	1.02	3.3	[1.8, 6.1]	2.1
S15	0.60	[0.16, 2.30]	1.02	1.0	[0.2, 3.9]	2.1

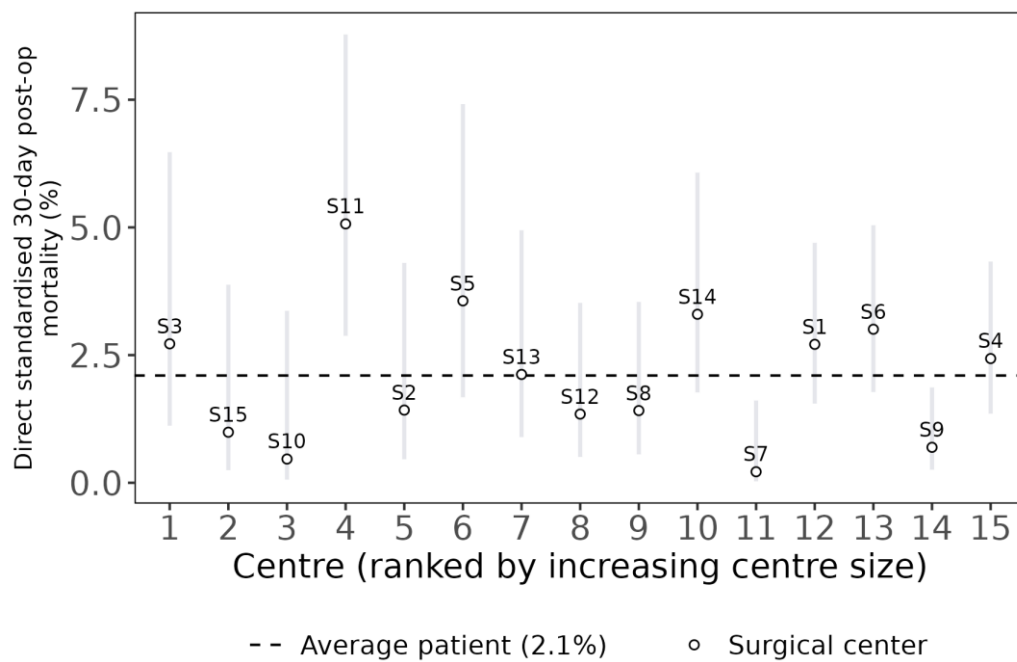
Adjusted for age at diagnosis, sex, ASA score, Charlson Comorbidity Index, type of surgery, vascular resection/reconstruction and tumour type (as proposed by the Belgian Pancreatic Cancer Group).

This table shows the case-mix adjusted odds ratio for postoperative mortality within 30 days and the center specific direct standardized 30-day mortality (%), together with their accompanying 95% confidence intervals. The ‘average patient’ odds ratio is obtained as a weighted average of the individual centre results with the fraction of patients per centre as weights. The ‘average patient’ results for the case-mix adjusted odds ratio and the direct standardized mortality serve as references and enable comparison of the individual center results with the reference. An individual center result is significantly different from the average result if the average result is not included in the center specific confidence interval.

The postoperative mortality probability was modelled using a logistic regression model. All the possible two-way interaction terms between the case-mix variables were evaluated during the model building procedure. The quality of the regression was assessed taking into account the deviance as well as Pearson goodness-of-fit and the Hosmer and

Lemeshow goodness-of-fit test, and the residual plots were examined for potential influential points and resolved when needed.

Figure 15. Direct standardised 30-day postoperative mortality in the six convention years, by surgical centre.



3.3.1.3. Unadjusted 90-day postoperative mortality

Table 15. Unadjusted 90-day postoperative mortality for **malignant and benign tumoural** pathology in the six convention years, by patient and tumour characteristics.

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Operated patients with a malignant/benign tumour	5,071	213	4.2	[3.7, 4.8]
Expert centers				
S1	483	23	4.8	[3.0, 7.1]
S2	220	13	5.9	[3.2, 9.9]
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S6	502	27	5.4	[3.6, 7.7]
S7	381	6	1.6	[0.6, 3.4]
S8	305	11	3.6	[1.8, 6.4]
S9	541	12	2.2	[1.2, 3.8]
S10	175	10	5.7	[2.8, 10.3]
S11	208	19	9.1	[5.6, 13.9]
S12	269	8	3.0	[1.3, 5.8]
S13	227	8	3.5	[1.5, 6.8]
S14	336	16	4.8	[2.7, 7.6]
S15	170	11	6.5	[3.3, 11.3]
Convention year				
Year 1	724	33	4.6	[3.2, 6.3]
Year 2	856	47	5.5	[4.1, 7.2]
Year 3	851	45	5.3	[3.9, 7.0]
Year 4	834	28	3.4	[2.2, 4.8]
Year 5	913	31	3.4	[2.3, 4.8]
Year 6	893	29	3.2	[2.2, 4.6]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Sex				
Female	2,364	94	4.0	[3.2, 4.8]
Male	2,707	119	4.4	[3.7, 5.2]
Age at surgery				
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70-79	1,760	106	6.0	[5.0, 7.2]
>=80	476	33	6.9	[4.8, 9.6]
Lesion to treat (in (peri-)pancreas)				
Metastasis	70	3	4.3	[0.9, 12.0]
Missing	2	0	0.0	[0.0, 84.2]
Primary tumour	4,935	206	4.2	[3.6, 4.8]
Relapse of primary tumour	64	4	6.2	[1.7, 15.2]
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Other or unspecified	417	13	3.1	[1.7, 5.3]
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C25.0 Head of pancreas	1,908	104	5.5	[4.5, 6.6]
C25.1 Body of pancreas	441	13	2.9	[1.6, 5.0]
C25.2 Tail of pancreas	699	15	2.1	[1.2, 3.5]
C25.3 Pancreatic duct	19	0	0.0	[0.0, 17.6]
C25.4 Islands of Langerhans	35	0	0.0	[0.0, 10.0]
C25.7-9 Other specified parts of pancreas	219	13	5.9	[3.2, 9.9]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
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Other	137	5	3.6	[1.2, 8.3]
Clinical stage				
0	111	1	0.9	[0.0, 4.9]
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II	1,196	59	4.9	[3.8, 6.3]
III	448	23	5.1	[3.3, 7.6]
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TNM not applicable or relapse*	834	17	2.0	[1.2, 3.2]
Prior surgery or other treatment **				
Prior abdominal surgery	749	37	4.9	[3.5, 6.7]
Other treatment modality (that could affect the pancreas)	689	36	5.2	[3.7, 7.2]
Neoadjuvant treatment				
Chemoradiotherapy	102	6	5.9	[2.2, 12.4]
Chemotherapy	706	15	2.1	[1.2, 3.5]
Radiotherapy	4	0	0.0	[0.0, 60.2]
No chemo or radiation treatment	4,259	192	4.5	[3.9, 5.2]
Charlson Comorbidity Index				
0	2,118	53	2.5	[1.9, 3.3]
1	1,226	59	4.8	[3.7, 6.2]
2	810	38	4.7	[3.3, 6.4]
3	403	20	5.0	[3.1, 7.6]
4	233	16	6.9	[4.0, 10.9]
5	105	10	9.5	[4.7, 16.8]
6	83	8	9.6	[4.3, 18.1]
7	44	3	6.8	[1.4, 18.7]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
8	30	3	10.0	[2.1, 26.5]
9	10	1	10.0	[0.3, 44.5]
10	5	2	40.0	[5.3, 85.3]
11	2	0	0.0	[0.0, 84.2]
12	2	0	0.0	[0.0, 84.2]
WHO score at surgery				
0 - Asymptomatic, normal activity	1,558	40	2.6	[1.8, 3.5]
1 - Symptomatic, but ambulant	2,946	118	4.0	[3.3, 4.8]
2 - Symptomatic, bedbound < 50% day	484	44	9.1	[6.7, 12.0]
3 - Symptomatic, bedbound > 50% day	80	10	12.5	[6.2, 21.8]
4 - Completely dependent, 100% bedbound	3	1	33.3	[0.8, 90.6]
ASA score				
1 - Healthy person	307	7	2.3	[0.9, 4.6]
2 - Mild systemic disease, normal activity	2,636	91	3.5	[2.8, 4.2]
3 - Serious systemic disease, limited activity	2,073	110	5.3	[4.4, 6.4]
4 - Life-threatening illness, handicapped	55	5	9.1	[3.0, 20.0]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	1,329	28	2.1	[1.4, 3.0]
Minimally invasive surgery (MIS) - Hybrid	5	1	20.0	[0.5, 71.6]
Minimally invasive surgery (MIS) - Robotic	712	23	3.2	[2.1, 4.8]
Open	2,785	144	5.2	[4.4, 6.1]
Conversion from MIS to open surgery	240	17	7.1	[4.2, 11.1]
Resectability status***				

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Before neoadjuvant treatment				
Upfront resectable	147	2	1.4	[0.2, 4.8]
Borderline resectable	414	13	3.1	[1.7, 5.3]
Unresectable	91	4	4.4	[1.2, 10.9]
No neoadjuvant treatment	2,764	131	4.7	[4.0, 5.6]
Before surgery				
Upfront resectable	2,984	132	4.4	[3.7, 5.2]
Borderline resectable	431	17	3.9	[2.3, 6.2]
Unresectable	26	1	3.8	[0.1, 19.6]
Missing	7	1	14.3	[0.4, 57.9]
<i>Simultaneous venous resection</i>				
No	4,448	171	3.8	[3.3, 4.5]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	623	42	6.7	[4.9, 9.0]
With primary wedge-reconstruction	206	12	5.8	[3.0, 10.0]
With primary end-to-end reconstruction	251	21	8.4	[5.3, 12.5]
With vascular autograft interposition	15	0	0.0	[0.0, 21.8]
With vascular allograft interposition	78	4	5.1	[1.4, 12.6]
With synthetic/prosthetic interposition	12	2	16.7	[2.1, 48.4]
With peritoneal patch wedge-reconstruction	50	2	4.0	[0.5, 13.7]
Without reconstruction	11	1	9.1	[0.2, 41.3]
<i>Simultaneous arterial resection**</i>				
No	4,991	209	4.2	[3.6, 4.8]
Hepatic artery resection	33	1	3.0	[0.1, 15.8]
With primary wedge-reconstruction	0	0	0.0	-

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
With primary end-to-end reconstruction	20	0	0.0	[0.0, 16.8]
With vascular autograft interposition	1	0	0.0	[0.0, 97.5]
With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
With synthetic/prosthetic interposition	0	0	0.0	-
Without reconstruction	11	1	9.1	[0.2, 41.3]
Coeliac trunk resection	37	2	5.4	[0.7, 18.2]
With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
With primary end-to-end reconstruction	2	0	0.0	[0.0, 84.2]
With vascular autograft interposition	0	0	0.0	-
With vascular allograft interposition	0	0	0.0	-
With synthetic/prosthetic interposition	0	0	0.0	-
Without reconstruction	34	2	5.9	[0.7, 19.7]
Superior mesenteric artery (SMA) resection	9	1	11.1	[0.3, 48.2]
With primary wedge-reconstruction	1	1	100.0	[2.5, 100.0]
With primary end-to-end reconstruction	3	0	0.0	[0.0, 70.8]
With vascular autograft interposition	2	0	0.0	[0.0, 84.2]
With vascular allograft interposition	0	0	0.0	-
With synthetic/prosthetic interposition	0	0	0.0	-
Without reconstruction	3	0	0.0	[0.0, 70.8]
Simultaneous other organ resection				
**				
No	3,097	140	4.5	[3.8, 5.3]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Colon	125	7	5.6	[2.3, 11.2]
Stomach	698	40	5.7	[4.1, 7.7]
Adrenal gland	101	1	1.0	[0.0, 5.4]
Spleen	1,161	34	2.9	[2.0, 4.1]
Other	304	9	3.0	[1.4, 5.5]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	3,337	175	5.2	[4.5, 6.1]
Pancreaticoduodenectomy	3,012	155	5.1	[4.4, 6.0]
Total Pancreatectomy	324	20	6.2	[3.8, 9.4]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	456	11	2.4	[1.2, 4.3]
242874-242885: Hemipancreatectomy left	1,202	26	2.2	[1.4, 3.2]
242896-242900: Enucleation of a pancreatic tumour	76	1	1.3	[0.0, 7.1]
Antithrombotic medication				
No	3,578	127	3.5	[3.0, 4.2]
Yes	1,493	86	5.8	[4.6, 7.1]
Was the patient referred?				
No	2,328	87	3.7	[3.0, 4.6]
Yes	2,743	126	4.6	[3.8, 5.4]

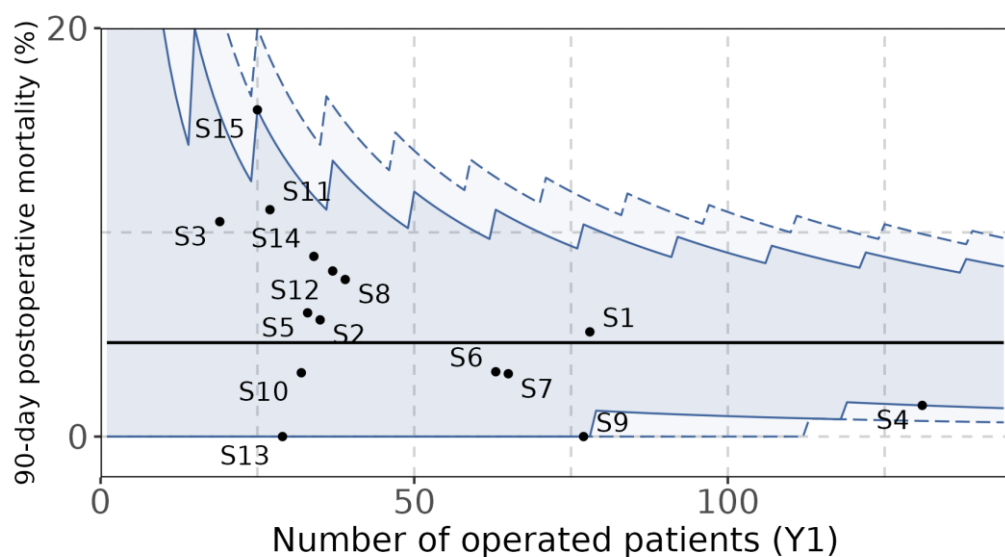
*: Tumour staging not possible.

** : Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

***: Results for this variable are only for malignant tumours and only available from the second half of Y2 onwards.

Figure 16. Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality for **malignant and benign tumoural pathology**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

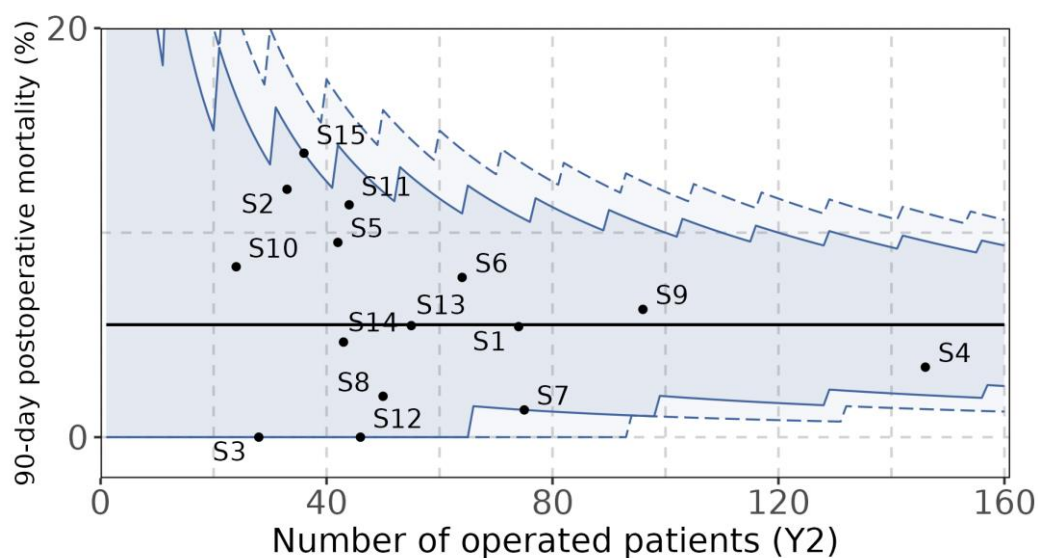
a)



• Surgical center %

— Belgium (4.6%) — 95% -- 99%

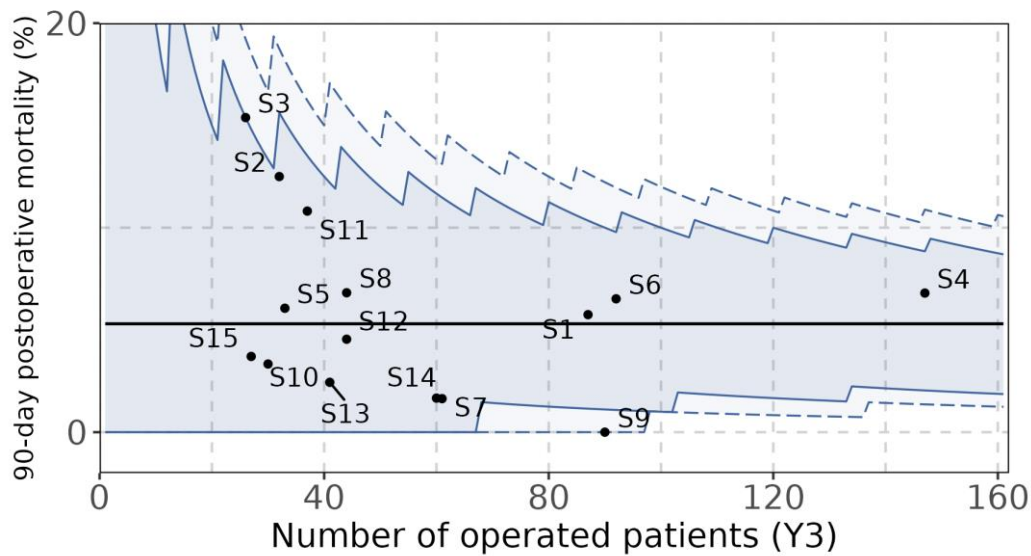
b)



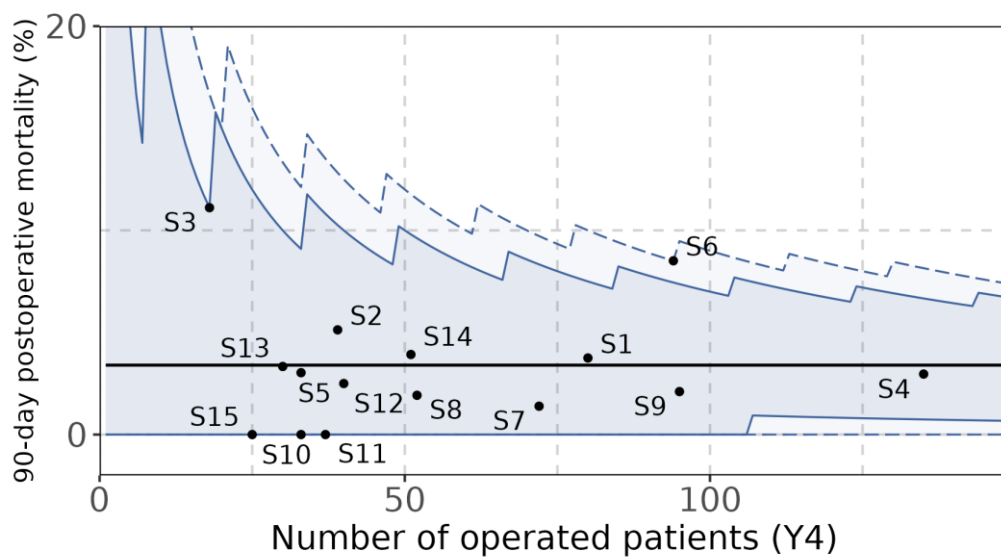
• Surgical center %

— Belgium (5.5%) — 95% -- 99%

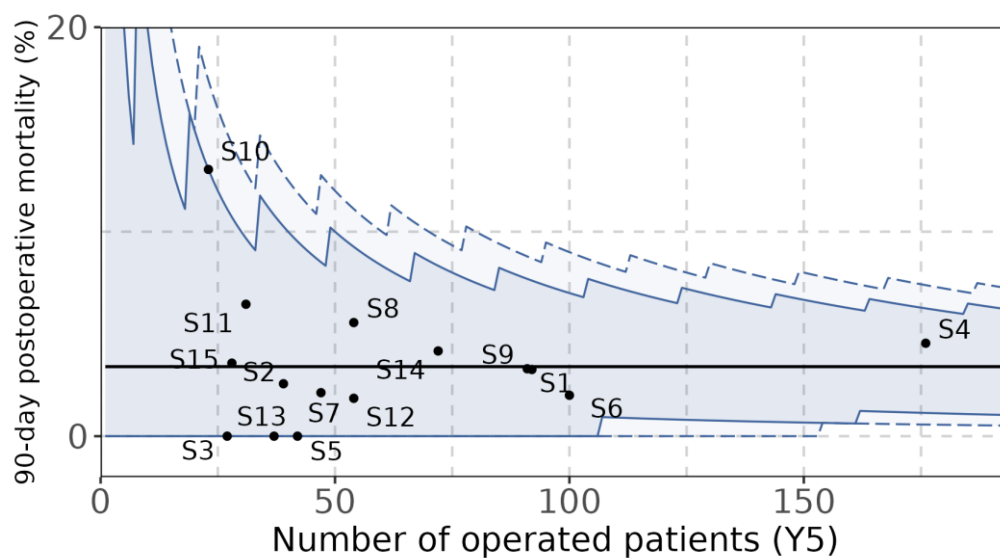
c)



d)



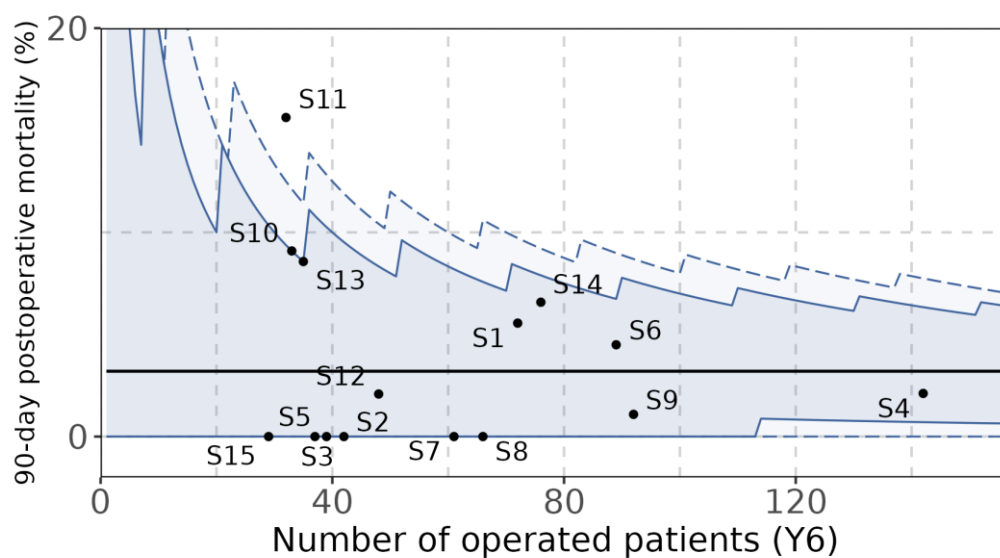
e)



• Surgical center %

— Belgium (3.4%) — 95% -- 99%

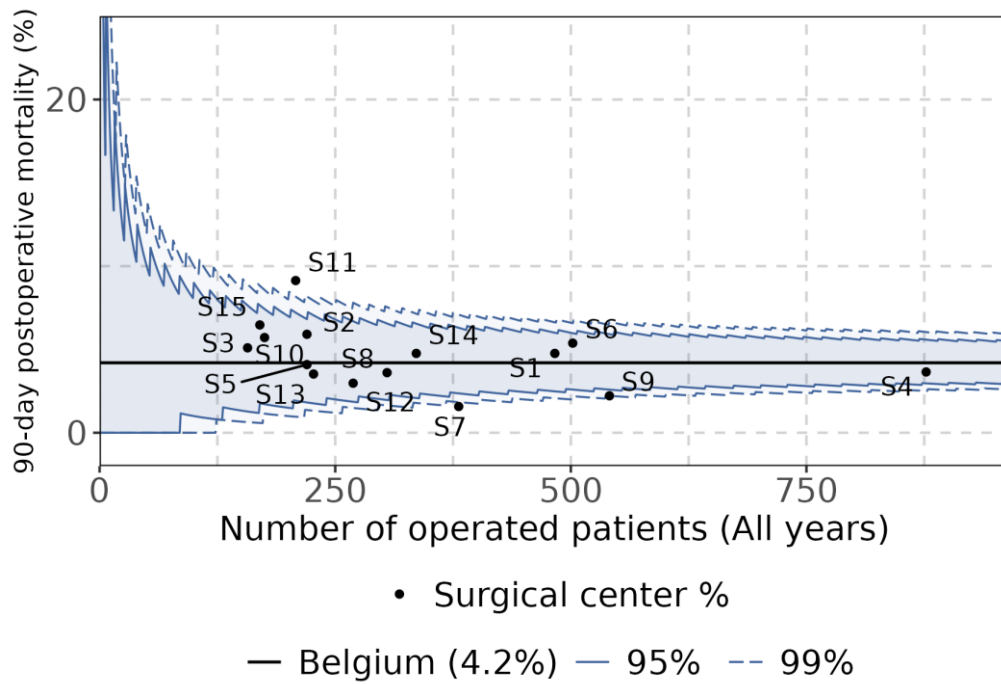
f)



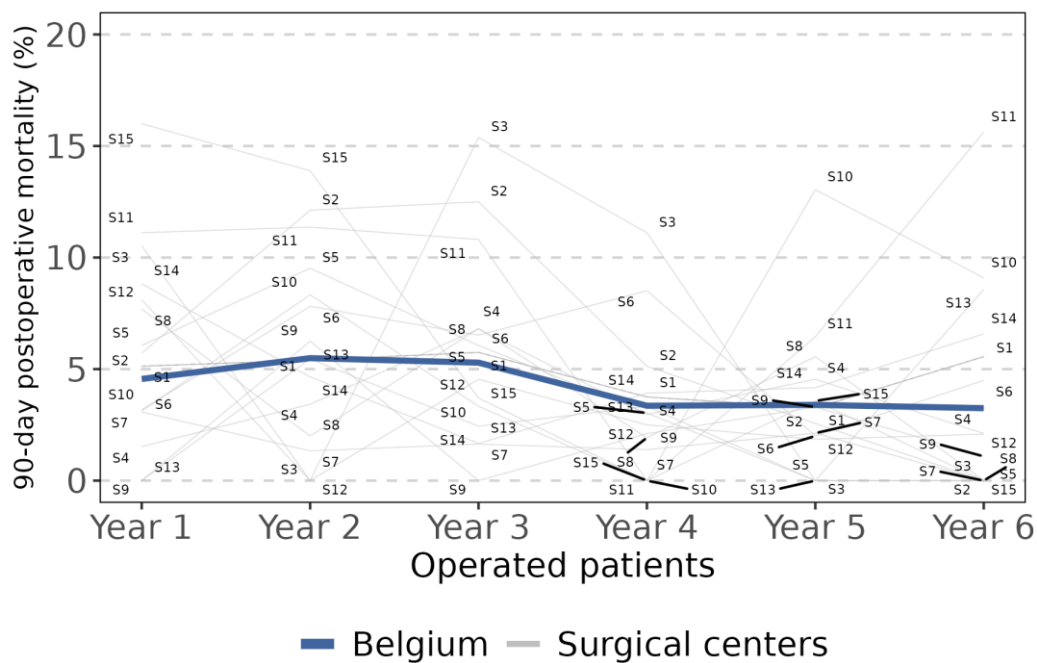
• Surgical center %

— Belgium (3.2%) — 95% -- 99%

g)



h)



3.3.1.4. Adjusted 90-day postoperative mortality

Table 16. Case-mix adjusted odds ratio for postoperative mortality within 90 days and direct standardised 30-day postoperative mortality, for **malignant and benign tumoural** pathology, in the six convention years.

Expert centers	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	1.22	[0.79, 1.88]	0.97	4.9	[3.2, 7.3]	4.3
S2	1.53	[0.88, 2.67]	0.97	6.1	[3.6, 10.1]	4.3
S3	1.04	[0.52, 2.07]	0.97	4.2	[2.1, 8.2]	4.3
S4	1.35	[0.85, 2.16]	0.97	5.4	[3.5, 8.1]	4.3
S5	1.10	[0.58, 2.12]	0.97	4.5	[2.3, 8.5]	4.3
S6	1.30	[0.87, 1.96]	0.97	5.2	[3.6, 7.5]	4.3
S7	0.33	[0.15, 0.73]	0.97	1.4	[0.6, 3.2]	4.3
S8	1.00	[0.55, 1.81]	0.97	4.1	[2.3, 7.1]	4.3
S9	0.46	[0.26, 0.81]	0.97	2.0	[1.1, 3.4]	4.3
S10	1.23	[0.65, 2.34]	0.97	4.9	[2.6, 9.2]	4.3
S11	1.90	[1.17, 3.08]	0.97	7.3	[4.7, 11.4]	4.3
S12	0.57	[0.29, 1.14]	0.97	2.4	[1.2, 4.7]	4.3
S13	0.82	[0.42, 1.63]	0.97	3.4	[1.7, 6.6]	4.3
S14	1.16	[0.69, 1.97]	0.97	4.7	[2.9, 7.6]	4.3
S15	1.35	[0.74, 2.46]	0.97	5.4	[3.0, 9.4]	4.3

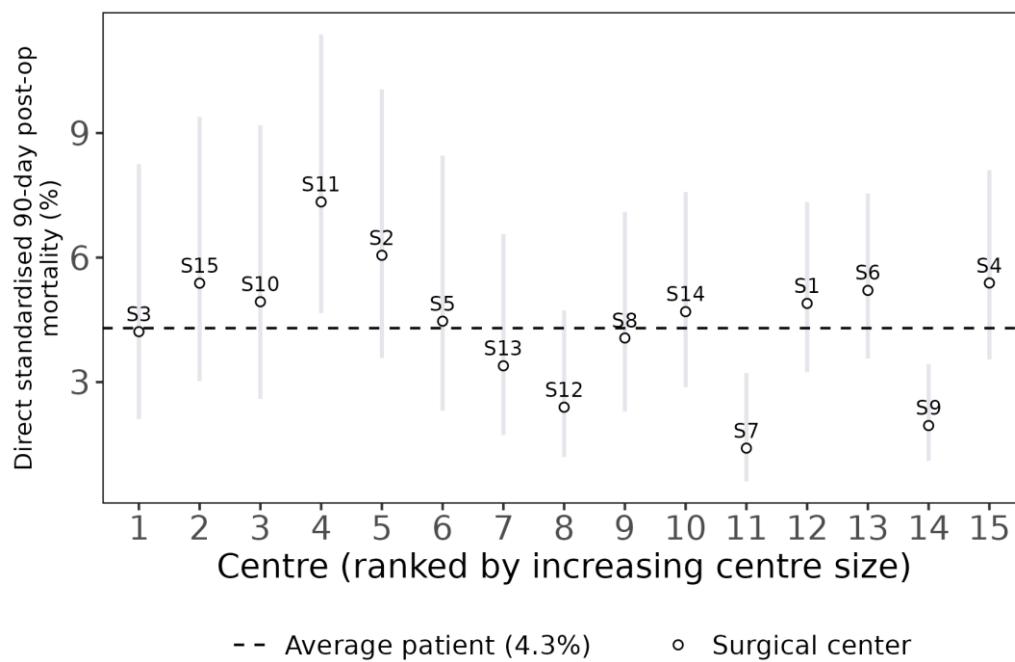
Adjusted for age at diagnosis, sex, ASA score, Charlson Comorbidity Index, type of surgery, vascular resection/reconstruction and tumour type (as proposed by the Belgian Pancreatic Cancer Group).

This table shows the case-mix adjusted odds ratio for postoperative mortality within 90 days and the center specific direct standardized 90-day mortality (%), together with their accompanying 95% confidence intervals. The ‘average patient’ odds ratio is obtained as a weighted average of the individual centre results with the fraction of patients per centre as weights. The ‘average patient’ results for the case-mix adjusted odds ratio and the direct standardized mortality serve as references and enable comparison of the individual center results with the reference. An individual center result is significantly different from the average result if the average result is not included in the center specific confidence interval.

The postoperative mortality probability was modelled using a logistic regression model. All the possible two-way interaction terms between the case-mix variables were evaluated during the model building procedure. The quality of the regression was assessed taking into account the deviance as well as Pearson goodness-of-fit and the Hosmer and

Lemeshow goodness-of-fit test, and the residual plots were examined for potential influential points and resolved when needed.

Figure 17. Direct standardised 90-day postoperative mortality in the six convention years, by surgical centre.



3.3.2. Survival

Survival indicator 5 years after surgery cannot yet be calculated since there is only a limited number of patients with a 5-year follow-up after surgery at the time the report was made. The vital status used in these analyses was determined on the 6th of November 2025.

3.3.2.1. Unadjusted observed survival after surgery (all causes of death) for malignant and benign tumours

Table 17. Number of events, total person years, hazard and 95% CI, during the first year interval after surgery for **malignant and benign tumours**, in the six convention years.

Belgium					
Characteristic	N	N of deaths	Person Years	Hazard	95% CI
<i>Operated patients with a malignant/benign tumour</i>	5,071	799	4,475	0.18	[0.17,0.19]
<i>Expert centers</i>					
S1	483	94	421	0.22	[0.18,0.27]
S2	220	35	191	0.18	[0.13,0.25]
S3	157	25	135	0.19	[0.12,0.27]
S4	877	114	786	0.15	[0.12,0.17]
S5	220	24	198	0.12	[0.08,0.18]
S6	502	85	437	0.19	[0.16,0.24]
S7	381	37	351	0.11	[0.07,0.15]
S8	305	56	265	0.21	[0.16,0.27]
S9	541	90	482	0.19	[0.15,0.23]
S10	175	30	154	0.20	[0.13,0.28]
S11	208	60	170	0.35	[0.27,0.46]
S12	269	38	240	0.16	[0.11,0.22]
S13	227	28	207	0.14	[0.09,0.20]
S14	336	50	293	0.17	[0.13,0.23]
S15	170	33	145	0.23	[0.16,0.32]
<i>Convention year</i>					
Year 1	724	149	654	0.23	[0.19,0.27]
Year 2	856	139	782	0.18	[0.15,0.21]

Belgium					
Characteristic	N	N of deaths	Person Years	Hazard	95% CI
Year 3	851	148	771	0.19	[0.16,0.23]
Year 4	834	133	765	0.17	[0.15,0.21]
Year 5	913	136	842	0.16	[0.14,0.19]
Year 6	893	94	659	0.14	[0.12,0.17]
<i>Tumoural Pathology</i>					
Adenocarcinoma	3,271	690	2,812	0.25	[0.23,0.26]
Benign tumour	711	26	670	0.04	[0.03,0.06]
Neuroendocrine tumour	672	34	618	0.05	[0.04,0.08]
Other or unspecified	417	49	375	0.13	[0.10,0.17]

Table 18. Unadjusted observed 1 year survival after surgery for adenocarcinoma , death by all causes, per individual expert center.

1 year observed survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	59	79.7	[67.0,87.9]	60	73.3	[60.2,82.7]	56	73.2	[59.6,82.9]	55	81.8	[68.8,89.8]	61	71.7	[58.4,81.3]	52	74.5	[57.6,85.5]	343	75.5	[70.5,79.8]
S2	27	NA	NA	16	NA	NA	20	NA	NA	25	NA	NA	21	NA	NA	25	NA	NA	134	75.2	[66.7,81.8]
S3	15	NA	NA	19	NA	NA	20	NA	NA	13	NA	NA	20	NA	NA	26	NA	NA	113	77.2	[67.9,84.1]
S4	69	78.3	[66.6,86.3]	81	85	[75.1,91.2]	87	79.3	[69.2,86.4]	94	81.9	[72.5,88.3]	112	82.9	[74.6,88.8]	88	83	[70.9,90.4]	531	81.9	[78.3,85.0]
S5	22	NA	NA	24	NA	NA	21	NA	NA	20	NA	NA	22	NA	NA	22	NA	NA	131	85.1	[77.3,90.3]
S6	44	79.5	[64.4,88.8]	43	69.8	[53.7,81.2]	69	72.5	[60.3,81.5]	62	75.8	[63.1,84.6]	70	79.4	[67.7,87.3]	55	81	[64.8,90.2]	343	76.2	[71.2,80.5]
S7	41	65.9	[49.3,78.2]	47	85.1	[71.3,92.6]	36	NA	NA	47	93.6	[81.5,97.9]	28	NA	NA	33	NA	NA	232	85.5	[80.1,89.5]
S8	29	NA	NA	30	NA	NA	30	NA	NA	33	NA	NA	37	NA	NA	46	84.9	[66.8,93.6]	205	74.6	[67.6,80.2]
S9	46	78.3	[63.4,87.7]	66	77.3	[65.2,85.6]	63	77.8	[65.4,86.2]	59	78	[65.1,86.6]	58	81	[68.4,89.0]	56	75.9	[59.7,86.3]	348	78.1	[73.3,82.1]
S10	21	NA	NA	15	NA	NA	14	NA	NA	25	NA	NA	13	NA	NA	19	NA	NA	107	73.7	[64.0,81.2]
S11	19	NA	NA	36	NA	NA	27	NA	NA	23	NA	NA	23	NA	NA	20	NA	NA	148	62.7	[54.2,70.0]
S12	27	NA	NA	25	NA	NA	29	NA	NA	20	NA	NA	36	NA	NA	34	NA	NA	171	78.5	[71.4,84.1]
S13	18	NA	NA	44	86.4	[72.1,93.6]	30	NA	NA	18	NA	NA	17	NA	NA	20	NA	NA	147	84	[76.9,89.1]
S14	24	NA	NA	26	NA	NA	35	NA	NA	35	NA	NA	45	77.8	[62.6,87.4]	47	84.6	[70.3,92.4]	212	78.9	[72.6,83.9]
S15	15	NA	NA	22	NA	NA	15	NA	NA	16	NA	NA	16	NA	NA	22	NA	NA	106	72.1	[62.2,79.9]

α : $N < 40$

Table 19. Unadjusted observed 3 year survival after surgery for adenocarcinoma , death by all causes, per individual expert center.

3 year observed survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	59	42.4	[29.7,54.5]	60	43.3	[30.7,55.3]	56	44.6	[31.4,57.0]	55	45.1	[31.1,58.2]	61	NA	NA	52	NA	NA	343	43	[37.0,48.8]
S2	27	NA	NA	16	NA	NA	20	NA	NA	25	NA	NA	21	NA	NA	25	NA	NA	134	44.5	[34.2,54.2]
S3	15	NA	NA	19	NA	NA	20	NA	NA	13	NA	NA	20	NA	NA	26	NA	NA	113	42.3	[30.7,53.4]
S4	69	46.4	[34.3,57.6]	81	52.5	[41.0,62.7]	87	41.4	[31.0,51.4]	94	43.3	[33.1,53.0]	112	NA	NA	88	NA	NA	531	46.1	[41.0,50.9]
S5	22	NA	NA	24	NA	NA	21	NA	NA	20	NA	NA	22	NA	NA	22	NA	NA	131	62	[51.6,70.8]
S6	44	45.5	[30.5,59.3]	43	48.8	[33.3,62.6]	69	44.9	[33.0,56.1]	62	51.3	[37.3,63.6]	70	NA	NA	55	NA	NA	343	49.3	[43.0,55.3]
S7	41	48.8	[32.9,62.9]	47	53.2	[38.1,66.2]	36	NA	NA	47	60.7	[44.8,73.2]	28	NA	NA	33	NA	NA	232	56	[48.6,62.8]
S8	29	NA	NA	30	NA	NA	30	NA	NA	33	NA	NA	37	NA	NA	46	NA	NA	205	43.1	[34.8,51.1]
S9	46	50	[34.9,63.3]	66	37.9	[26.3,49.4]	63	47.6	[34.9,59.3]	59	48	[34.4,60.4]	58	NA	NA	56	NA	NA	348	46	[39.9,51.9]
S10	21	NA	NA	15	NA	NA	14	NA	NA	25	NA	NA	13	NA	NA	19	NA	NA	107	35.5	[25.0,46.2]
S11	19	NA	NA	36	NA	NA	27	NA	NA	23	NA	NA	23	NA	NA	20	NA	NA	148	35.4	[26.8,44.1]
S12	27	NA	NA	25	NA	NA	29	NA	NA	20	NA	NA	36	NA	NA	34	NA	NA	171	48.4	[39.4,56.9]
S13	18	NA	NA	44	61.4	[45.4,73.9]	30	NA	NA	18	NA	NA	17	NA	NA	20	NA	NA	147	51.6	[42.3,60.1]

3 year observed survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S14	24	NA	NA	26	NA	NA	35	NA	NA	35	NA	NA	45	NA	NA	47	NA	NA	212	46.1	[37.7,54.1]
S15	15	NA	NA	22	NA	NA	15	NA	NA	16	NA	NA	16	NA	NA	22	NA	NA	106	35.6	[24.5,46.9]

NA: N<40

NA: 3-year follow-up after surgery is not reached.

Table 20. Unadjusted 1-year observed survival after surgery for **adenocarcinoma**, death by all causes, in the six convention years.

1 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Operated patients with adenocarcinoma	3,271	78.0	[76.5,79.4]
Convention year			
Year 1	476	73.3	[69.1,77.0]
Year 2	554	78.5	[74.8,81.7]
Year 3	552	76.1	[72.3,79.4]
Year 4	545	78.9	[75.2,82.1]
Year 5	579	79.7	[76.1,82.7]
Year 6	565	82.3	[78.2,85.7]
Sex			
Male	1,763	76.8	[74.7,78.7]
Female	1,508	79.4	[77.2,81.4]
Age at surgery			
<=69	1,692	83.8	[81.9,85.5]
70-79	1,206	74.5	[71.9,76.9]
>=80	373	63.0	[57.7,67.8]
Lesion to treat (in oesophagus/GOI)			
Primary tumour	3,199	77.8	[76.3,79.2]
Relapse of primary tumour	32	NA ^a	NA ^a
Metastasis	40	94.4	[79.3,98.6]
Primary tumour localisation			
C17.0 Duodenum	175	83.9	[77.3,88.6]
C24.0 Extrahepatic bile duct	243	80.5	[74.8,85.1]
C24.1 (Peri-) ampullary region	397	84.8	[80.8,88.0]
C25.0 Head of pancreas	1,615	74.4	[72.1,76.5]
C25.1 Body of pancreas	280	81.5	[76.3,85.6]
C25.2 Tail of pancreas	330	80.8	[76.0,84.7]

1 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
C25.3 Pancreatic duct	13	NA $\ddagger$	NA $\ddagger$
C25.7-9 Other specified parts of pancreas	130	70.1	[61.2,77.4]
Other	88	85.0	[75.6,91.0]
Clinical stage			
0	43	95.0	[81.3,98.7]
I	1,695	77.9	[75.8,79.9]
II	886	75.7	[72.7,78.5]
III	368	79.8	[75.2,83.6]
IV	75	75.5	[63.9,83.8]
X	171	83.0	[76.3,87.9]
TNM not applicable or relapse *	33	NA $\ddagger$	NA $\ddagger$
Pathological stage			
0	57	96.3	[85.9,99.1]
I	566	84.0	[80.7,86.9]
II	936	77.6	[74.7,80.2]
III	853	72.9	[69.8,75.8]
IV	66	61.5	[48.6,72.2]
X	32	NA $\ddagger$	NA $\ddagger$
TNM not applicable or relapse *	24	NA $\ddagger$	NA $\ddagger$
Neoadjuvant treatment °	737	79.8	[76.7,82.6]
yPathological stage			
0	24	NA $\ddagger$	NA $\ddagger$
I	255	85.4	[80.3,89.3]
II	251	77.6	[71.8,82.4]
III	153	75.8	[68.1,81.9]
IV	42	64.0	[46.8,77.0]
X	3	NA $\ddagger$	NA $\ddagger$
TNM not applicable or relapse *	9	NA $\ddagger$	NA $\ddagger$

1 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
No neoadjuvant treatment	2,534	77.5	[75.7,79.1]
Resection margin			
R0	2,233	82.1	[80.4,83.7]
R1	1,027	69.2	[66.2,72.0]
R2	11	NA $\times$	NA $\times$
Prior surgery or endoscopic treatment**			
Prior abdominal surgery	495	77.8	[73.8,81.2]
Other treatment modality (that could affect the oesophagus)	586	80.0	[76.5,83.1]
Neoadjuvant treatment			
Chemoradiotherapy	96	77.1	[67.1,84.5]
Chemotherapy	638	80.3	[76.9,83.2]
Radiotherapy	3	NA $\times$	NA $\times$
No chemo or radiation treatment	2,534	77.5	[75.7,79.1]
Charlson Comorbidity Index			
0	1,286	83.4	[81.2,85.4]
1	837	75.7	[72.6,78.5]
2	529	75.3	[71.2,78.8]
3	273	74.9	[69.2,79.7]
4	161	68.8	[60.9,75.4]
5	76	70.9	[58.9,80.0]
6	47	76.2	[61.2,86.1]
7	32	NA $\times$	NA $\times$
8	18	NA $\times$	NA $\times$
9	8	NA $\times$	NA $\times$
10	3	NA $\times$	NA $\times$
WHO score at surgery			
0 - Asymptomatic, normal activity	786	83.0	[80.1,85.5]

1 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
1 - Symptomatic, but ambulant	2,040	78.9	[77.0,80.6]
2 - Symptomatic, bedbound < 50% day	374	65.9	[60.7,70.6]
3 - Symptomatic, bedbound > 50% day	69	60.8	[47.9,71.4]
4 - Completely dependent, 100% bedbound	2	NA	NA
ASA score			
1 - Healthy person	152	83.8	[76.8,88.9]
2 - Mild systemic disease, normal activity	1,630	80.6	[78.5,82.5]
3 - Serious systemic disease, limited activity	1,447	74.6	[72.2,76.8]
4 - Life-threatening illness, handicapped	42	72.4	[55.7,83.7]
Resectability status			
Before neoadjuvant treatment			
Upfront resectable	141	86.8	[79.8,91.4]
Borderline resectable	389	79.4	[74.9,83.2]
Unresectable	84	82.9	[72.8,89.5]
No neoadjuvant treatment	1,942	78.7	[76.7,80.5]
Before surgery			
Upfront resectable	2,134	79.5	[77.7,81.2]
Borderline resectable	391	78.1	[73.5,82.0]
Unresectable	25	NA	NA
Missing	6	NA	NA
Type of surgery			
Minimally invasive surgery (MIS) - Laparoscopic	672	83.6	[80.5,86.2]
Minimally invasive surgery (MIS) - Hybrid	2	NA	NA
Minimally invasive surgery (MIS) - Robotic	357	79.3	[74.6,83.3]
Open	2,077	76.5	[74.6,78.3]

		1 year observed survival after surgery, %	
		Belgium	
Characteristic	N	%	95% CI
Conversion from MIS to open surgery	163	71.2	[63.4,77.7]
<i>Simultaneous venous resection</i>			
No	2,711	80.0	[78.4,81.5]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	560	68.0	[63.8,71.8]
- With primary wedge-reconstruction	189	71.7	[64.3,77.8]
- With primary end-to-end reconstruction	227	64.6	[57.9,70.5]
- With vascular autograft interposition	11	NA $\times$	NA $\times$
- With vascular allograft interposition	69	65.9	[53.2,75.9]
- With synthetic/prosthetic interposition	9	NA $\times$	NA $\times$
- With peritoneal patch wedge-reconstruction	45	76.2	[60.3,86.5]
- Without reconstruction	10	NA $\times$	NA $\times$
<i>Simultaneous arterial resection **</i>			
No	3,195	77.9	[76.4,79.3]
Hepatic artery resection	31	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	18	NA $\times$	NA $\times$
- With vascular allograft interposition	1	NA $\times$	NA $\times$
- Without reconstruction	11	NA $\times$	NA $\times$
Coeliac trunk resection	37	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	2	NA $\times$	NA $\times$
- Without reconstruction	34	NA $\times$	NA $\times$
Superior mesenteric artery (SMA) resection	7	NA $\times$	NA $\times$
- With primary wedge-reconstruction	1	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	3	NA $\times$	NA $\times$
- With vascular autograft interposition	2	NA $\times$	NA $\times$

		1 year observed survival after surgery, %	
		Belgium	
Characteristic	N	%	95% CI
- Without reconstruction	1	NA [†]	NA [†]
<i>Simultaneous other organ resection **</i>			
No	2,018	77.9	[76.0,79.7]
Colon	97	68.4	[58.0,76.8]
Stomach	553	76.7	[72.9,80.1]
Adrenal gland	79	83.3	[73.0,90.0]
Spleen	622	79.5	[76.0,82.5]
Other	191	75.0	[68.1,80.7]
<i>RIZIV code for complex surgery</i>			
242830-242841: Pancreaticoduodenectomy	2,588	77.1	[75.4,78.7]
Pancreaticoduodenectomy	2,389	77.7	[75.9,79.4]
Total Pancreatectomy	199	70.3	[63.2,76.3]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	210	83.4	[77.6,87.9]
242874-242885: Hemipancreatectomy left	470	80.5	[76.6,83.9]
242896-242900: Enucleation of a pancreatic tumour	3	NA [†]	NA [†]
<i>Antithrombotic medication</i>			
No	2,246	80.2	[78.5,81.8]
Yes	1,025	73.1	[70.2,75.8]
<i>Was the patient referred?</i>			
No	1,364	79.7	[77.4,81.8]
Yes	1,907	76.8	[74.8,78.7]

*: Tumour staging not possible.

°: Neoadjuvant treatment: patients who received either chemotherapy or radiotherapy, or a combination of these treatments prior to surgery.

** : Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

α : $N < 40$

Table 21. Unadjusted 3-year observed survival after surgery for **adenocarcinoma**, death by all causes, in the six convention years.

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Operated patients with adenocarcinoma	3,271	46.2	[44.2,48.2]
Convention year			
Year 1	476	45.7	[41.2,50.1]
Year 2	554	45.6	[41.4,49.7]
Year 3	552	42.8	[38.6,46.8]
Year 4	545	45.1	[40.5,49.6]
Year 5	579	NA	NA
Year 6	565	NA	NA
Sex			
Male	1,763	45.8	[43.1,48.5]
Female	1,508	46.8	[43.8,49.7]
Age at surgery			
<=69	1,692	51.4	[48.6,54.1]
70-79	1,206	44.0	[40.7,47.2]
>=80	373	29.9	[24.5,35.5]
Lesion to treat (in oesophagus/GOI)			
Primary tumour	3,199	45.8	[43.8,47.8]
Relapse of primary tumour	32	NA	NA
Metastasis	40	81.2	[62.6,91.2]
Primary tumour localisation			
C17.0 Duodenum	175	68.1	[59.4,75.3]
C24.0 Extrahepatic bile duct	243	46.2	[38.8,53.3]
C24.1 (Peri-) ampullary region	397	63.6	[57.8,68.8]
C25.0 Head of pancreas	1,615	38.6	[35.8,41.4]
C25.1 Body of pancreas	280	48.1	[41.0,54.8]
C25.2 Tail of pancreas	330	45.2	[38.8,51.4]

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
C25.3 Pancreatic duct	13	NA	NA
C25.7-9 Other specified parts of pancreas	130	43.9	[34.2,53.2]
Other	88	65.9	[53.8,75.6]
Clinical stage			
0	43	69.7	[48.5,83.6]
I	1,695	48.3	[45.5,51.0]
II	886	39.8	[36.1,43.6]
III	368	43.9	[37.9,49.7]
IV	75	48.3	[35.3,60.1]
X	171	57.2	[48.5,64.9]
TNM not applicable or relapse *	33	NA	NA
Pathological stage			
0	57	94.0	[82.5,98.1]
I	566	67.3	[62.7,71.4]
II	936	44.5	[40.7,48.2]
III	853	35.9	[32.2,39.7]
IV	66	28.8	[17.8,40.7]
X	32	NA	NA
TNM not applicable or relapse *	24	NA	NA
Neoadjuvant treatment °	737	42.4	[38.1,46.6]
yPathological stage			
0	24	NA	NA
I	255	54.0	[46.6,60.9]
II	251	33.4	[26.4,40.5]
III	153	35.1	[26.4,43.9]
IV	42	25.3	[10.1,44.0]
X	3	NA	NA
TNM not applicable or relapse *	9	NA	NA

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
No neoadjuvant treatment	2,534	47.4	[45.1,49.6]
Resection margin			
R0	2,233	53.0	[50.5,55.3]
R1	1,027	32.2	[28.9,35.6]
R2	11	NA $\times$	NA $\times$
Prior surgery or endoscopic treatment**			
Prior abdominal surgery	495	46.8	[41.6,51.8]
Other treatment modality (that could affect the oesophagus)	586	43.3	[38.4,48.1]
Neoadjuvant treatment			
Chemoradiotherapy	96	55.6	[43.3,66.2]
Chemotherapy	638	40.6	[36.1,45.1]
Radiotherapy	3	NA $\times$	NA $\times$
No chemo or radiation treatment	2,534	47.4	[45.1,49.6]
Charlson Comorbidity Index			
0	1,286	54.9	[51.7,58.0]
1	837	41.7	[37.8,45.7]
2	529	39.9	[35.0,44.8]
3	273	41.5	[34.8,48.0]
4	161	33.8	[25.3,42.4]
5	76	42.9	[29.8,55.3]
6	47	33.3	[18.4,49.0]
7	32	NA $\times$	NA $\times$
8	18	NA $\times$	NA $\times$
9	8	NA $\times$	NA $\times$
10	3	NA $\times$	NA $\times$
WHO score at surgery			
0 - Asymptomatic, normal activity	786	52.6	[48.3,56.7]

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
1 - Symptomatic, but ambulant	2,040	46.8	[44.3,49.3]
2 - Symptomatic, bedbound < 50% day	374	32.8	[27.2,38.6]
3 - Symptomatic, bedbound > 50% day	69	30.2	[18.0,43.4]
4 - Completely dependent, 100% bedbound	2	NA	NA
ASA score			
1 - Healthy person	152	55.2	[46.5,63.0]
2 - Mild systemic disease, normal activity	1,630	50.3	[47.4,53.0]
3 - Serious systemic disease, limited activity	1,447	41.1	[38.0,44.1]
4 - Life-threatening illness, handicapped	42	24.5	[11.2,40.5]
Resectability status			
Before neoadjuvant treatment			
Upfront resectable	141	48.5	[37.8,58.3]
Borderline resectable	389	42.1	[35.8,48.2]
Unresectable	84	43.2	[30.3,55.4]
No neoadjuvant treatment	1,942	47.8	[45.0,50.5]
Before surgery			
Upfront resectable	2,134	48.4	[45.7,51.0]
Borderline resectable	391	40.4	[34.4,46.3]
Unresectable	25	NA	NA
Missing	6	NA	NA
Type of surgery			
Minimally invasive surgery (MIS) - Laparoscopic	672	50.8	[46.5,55.0]
Minimally invasive surgery (MIS) - Hybrid	2	NA	NA
Minimally invasive surgery (MIS) - Robotic	357	45.6	[38.4,52.5]
Open	2,077	45.7	[43.2,48.2]

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Conversion from MIS to open surgery	163	33.9	[25.4,42.6]
<i>Simultaneous venous resection</i>			
No	2,711	49.9	[47.7,52.1]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	560	28.5	[24.2,33.0]
- With primary wedge-reconstruction	189	26.2	[18.7,34.3]
- With primary end-to-end reconstruction	227	29.2	[22.8,35.8]
- With vascular autograft interposition	11	NA $\times$	NA $\times$
- With vascular allograft interposition	69	17.5	[6.5,32.9]
- With synthetic/prosthetic interposition	9	NA $\times$	NA $\times$
- With peritoneal patch wedge-reconstruction	45	35.6	[20.2,51.2]
- Without reconstruction	10	NA $\times$	NA $\times$
<i>Simultaneous arterial resection **</i>			
No	3,195	46.5	[44.5,48.5]
Hepatic artery resection	31	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	18	NA $\times$	NA $\times$
- With vascular allograft interposition	1	NA $\times$	NA $\times$
- Without reconstruction	11	NA $\times$	NA $\times$
Coeliac trunk resection	37	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	2	NA $\times$	NA $\times$
- Without reconstruction	34	NA $\times$	NA $\times$
Superior mesenteric artery (SMA) resection	7	NA $\times$	NA $\times$
- With primary wedge-reconstruction	1	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	3	NA $\times$	NA $\times$
- With vascular autograft interposition	2	NA $\times$	NA $\times$

3 year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
- Without reconstruction	1	NA α	NA α
<i>Simultaneous other organ resection **</i>			
No	2,018	46.8	[44.2,49.3]
Colon	97	37.2	[26.7,47.7]
Stomach	553	43.5	[38.7,48.2]
Adrenal gland	79	37.7	[25.8,49.6]
Spleen	622	44.5	[39.8,49.2]
Other	191	46.6	[38.6,54.2]
<i>RIZIV code for complex surgery</i>			
242830-242841: Pancreaticoduodenectomy	2,588	45.9	[43.6,48.1]
Pancreaticoduodenectomy	2,389	46.4	[44.1,48.7]
Total Pancreatectomy	199	39.1	[30.8,47.2]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	210	47.5	[39.7,54.9]
242874-242885: Hemipancreatectomy left	470	47.8	[42.3,53.1]
242896-242900: Enucleation of a pancreatic tumour	3	NA α	NA α
<i>Antithrombotic medication</i>			
No	2,246	49.3	[46.8,51.7]
Yes	1,025	39.5	[36.0,43.1]
<i>Was the patient referred?</i>			
No	1,364	46.9	[43.8,50.0]
Yes	1,907	45.8	[43.2,48.3]

*: Tumour staging not possible.

°: Neoadjuvant treatment: patients who received either chemotherapy or radiotherapy, or a combination of these treatments prior to surgery. **: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

α : N<40

⌘⌘: 3-year follow-up after surgery is not reached.

Figure 18. Unadjusted 1-year observed survival after surgery for **adenocarcinoma**, death by all causes, for all years combined.

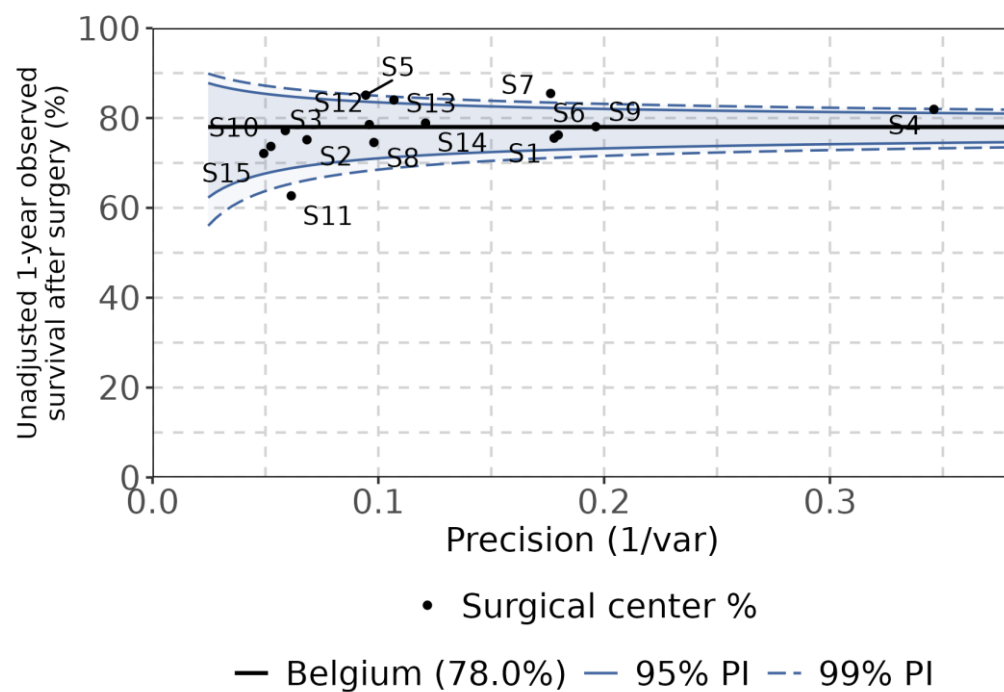
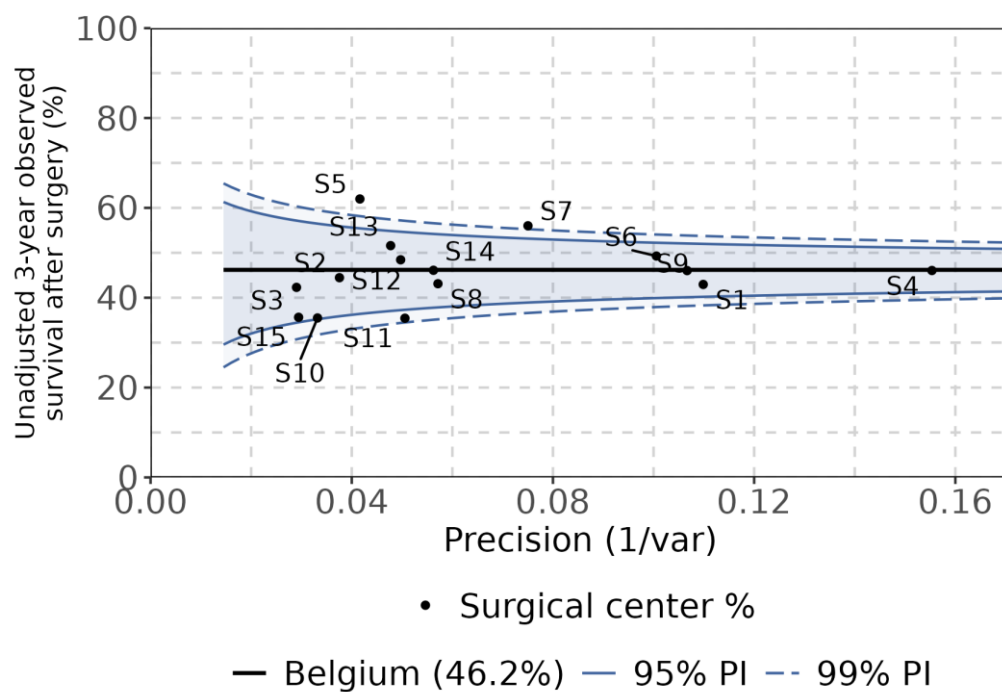


Figure 19. Unadjusted 3-year observed survival after surgery for **adenocarcinoma**, death by all causes, for all years combined.



3.3.2.2. Unadjusted relative survival after surgery for adenocarcinoma

Table 22. Unadjusted 1 year relative survival after surgery for **adenocarcinoma** per individual expert centre.

1 year relative survival after surgery, %																					
	Year 1			Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	59	81.3	[71.4,92.5]	60	75.1	[64.6,87.3]	56	75.2	[64.2,87.9]	55	83.2	[73.6,94.2]	61	73.4	[62.7,85.9]	52	75.9	[63.2,91.1]	343	77.3	[72.6,82.2]
S2	27	NA	NA	16	NA	NA	20	NA	NA	25	NA	NA	21	NA	NA	25	NA	NA	134	76.9	[69.6,84.9]
S3	15	NA	NA	19	NA	NA	20	NA	NA	13	NA	NA	20	NA	NA	26	NA	NA	113	79.1	[71.3,87.8]
S4	69	79.7	[70.4,90.2]	81	86.3	[78.7,94.5]	87	80.5	[72.4,89.6]	94	83.5	[76.0,91.8]	112	84.2	[77.4,91.6]	88	85.0	[76.0,95.1]	531	83.4	[80.1,86.9]
S5	22	NA	NA	24	NA	NA	21	NA	NA	20	NA	NA	22	NA	NA	22	NA	NA	131	86.8	[80.6,93.6]
S6	44	NA	NA	43	NA	NA	69	73.9	[63.9,85.4]	62	77.1	[67.0,88.7]	70	80.9	[71.7,91.4]	55	83.3	[71.8,96.7]	343	77.8	[73.2,82.7]
S7	41	NA	NA	47	NA	NA	36	NA	NA	47	NA	NA	28	NA	NA	33	NA	NA	232	87.3	[82.7,92.2]
S8	29	NA	NA	30	NA	NA	30	NA	NA	33	NA	NA	37	NA	NA	46	NA	NA	205	76.1	[69.9,82.9]
S9	46	NA	NA	66	79.2	[69.5,90.2]	63	79.5	[69.7,90.8]	59	79.4	[69.3,90.9]	58	82.4	[72.7,93.4]	56	77.6	[65.3,92.1]	348	79.7	[75.3,84.4]
S10	21	NA	NA	15	NA	NA	14	NA	NA	25	NA	NA	13	NA	NA	19	NA	NA	107	75.2	[67.0,84.4]
S11	19	NA	NA	36	NA	NA	27	NA	NA	23	NA	NA	23	NA	NA	20	NA	NA	148	64.3	[56.7,72.9]
S12	27	NA	NA	25	NA	NA	29	NA	NA	20	NA	NA	36	NA	NA	34	NA	NA	171	80.4	[74.1,87.1]
S13	18	NA	NA	44	NA	NA	30	NA	NA	18	NA	NA	17	NA	NA	20	NA	NA	147	86.0	[80.1,92.4]
S14	24	NA	NA	26	NA	NA	35	NA	NA	35	NA	NA	45	NA	NA	47	NA	NA	212	80.8	[75.2,86.8]

1 year relative survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S15	15	NA	NA	22	NA	NA	15	NA	NA	16	NA	NA	16	NA	NA	22	NA	NA	106	73.7	[65.3,83.2]

NA: N<50

Table 23. Unadjusted 3 year relative survival after surgery for **adenocarcinoma** per individual expert centre.

3 year relative survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	59	45.6	[34.1,61.0]	60	47.4	[35.6,63.1]	56	48.2	[36.0,64.4]	55	47.6	[35.2,64.5]	61	NA ^a _{xx}	NA ^a _{xx}	52	NA ^a _{xx}	NA ^a _{xx}	343	46.4	[40.4,53.2]
S2	27	NA ^a _{xx}	NA ^a _{xx}	16	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	25	NA ^a _{xx}	NA ^a _{xx}	21	NA ^a _{xx}	NA ^a _{xx}	25	NA ^a _{xx}	NA ^a _{xx}	134	47.8	[38.1,59.9]
S3	15	NA ^a _{xx}	NA ^a _{xx}	19	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	13	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	26	NA ^a _{xx}	NA ^a _{xx}	113	45.1	[34.3,59.4]
S4	69	49.3	[38.4,63.4]	81	54.7	[44.5,67.3]	87	44.1	[34.5,56.4]	94	45.9	[36.3,58.1]	112	NA ^a _{xx}	NA ^a _{xx}	88	NA ^a _{xx}	NA ^a _{xx}	531	48.8	[43.8,54.3]
S5	22	NA ^a _{xx}	NA ^a _{xx}	24	NA ^a _{xx}	NA ^a _{xx}	21	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	22	NA ^a _{xx}	NA ^a _{xx}	22	NA ^a _{xx}	NA ^a _{xx}	131	65.7	[56.3,76.8]
S6	44	NA ^a _{xx}	NA ^a _{xx}	43	NA ^a _{xx}	NA ^a _{xx}	69	47.2	[36.4,61.1]	62	54.3	[41.9,70.4]	70	NA ^a _{xx}	NA ^a _{xx}	55	NA ^a _{xx}	NA ^a _{xx}	343	52.4	[46.1,59.5]
S7	41	NA ^a _{xx}	NA ^a _{xx}	47	NA ^a _{xx}	NA ^a _{xx}	36	NA ^a _{xx}	NA ^a _{xx}	47	NA ^a _{xx}	NA ^a _{xx}	28	NA ^a _{xx}	NA ^a _{xx}	33	NA ^a _{xx}	NA ^a _{xx}	232	59.4	[52.2,67.6]
S8	29	NA ^a _{xx}	NA ^a _{xx}	30	NA ^a _{xx}	NA ^a _{xx}	30	NA ^a _{xx}	NA ^a _{xx}	33	NA ^a _{xx}	NA ^a _{xx}	37	NA ^a _{xx}	NA ^a _{xx}	46	NA ^a _{xx}	NA ^a _{xx}	205	46.7	[38.7,56.3]
S9	46	NA ^a _{xx}	NA ^a _{xx}	66	40.3	[29.6,54.8]	63	50.6	[39.2,65.4]	59	51.7	[39.5,67.7]	58	NA ^a _{xx}	NA ^a _{xx}	56	NA ^a _{xx}	NA ^a _{xx}	348	49.1	[43.0,55.9]
S10	21	NA ^a _{xx}	NA ^a _{xx}	15	NA ^a _{xx}	NA ^a _{xx}	14	NA ^a _{xx}	NA ^a _{xx}	25	NA ^a _{xx}	NA ^a _{xx}	13	NA ^a _{xx}	NA ^a _{xx}	19	NA ^a _{xx}	NA ^a _{xx}	107	37.6	[27.7,51.0]
S11	19	NA ^a _{xx}	NA ^a _{xx}	36	NA ^a _{xx}	NA ^a _{xx}	27	NA ^a _{xx}	NA ^a _{xx}	23	NA ^a _{xx}	NA ^a _{xx}	23	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	148	38.5	[30.2,49.2]
S12	27	NA ^a _{xx}	NA ^a _{xx}	25	NA ^a _{xx}	NA ^a _{xx}	29	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	36	NA ^a _{xx}	NA ^a _{xx}	34	NA ^a _{xx}	NA ^a _{xx}	171	51.8	[43.3,62.1]
S13	18	NA ^a _{xx}	NA ^a _{xx}	44	NA ^a _{xx}	NA ^a _{xx}	30	NA ^a _{xx}	NA ^a _{xx}	18	NA ^a _{xx}	NA ^a _{xx}	17	NA ^a _{xx}	NA ^a _{xx}	20	NA ^a _{xx}	NA ^a _{xx}	147	56.5	[47.7,67.0]

3 year relative survival after surgery, %																					
Year 1				Year 2			Year 3			Year 4			Year 5			Year 6			All years		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S14	24	NA	NA	26	NA	NA	35	NA	NA	35	NA	NA	45	NA	NA	47	NA	NA	212	49.5	[41.4,59.3]
S15	15	NA	NA	22	NA	NA	15	NA	NA	16	NA	NA	16	NA	NA	22	NA	NA	106	38.4	[28.0,52.6]

NA: N<50

NA: 3-year follow-up after surgery is not reached.

Table 24. Unadjusted 1-year relative survival after surgery for **adenocarcinoma** in the six convention years.

1 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Operated patients with adenocarcinoma	3,271	79.7	[78.2,81.2]
Convention year			
Year 1	476	74.8	[70.9,79.0]
Year 2	554	80.2	[76.8,83.8]
Year 3	552	77.8	[74.3,81.5]
Year 4	545	80.5	[77.1,84.1]
Year 5	579	81.3	[78.0,84.8]
Year 6	565	84.2	[80.4,88.1]
Sex			
Male	1,763	78.8	[76.7,80.9]
Female	1,508	80.7	[78.6,82.9]
Age at surgery			
<=69	1,692	84.5	[82.7,86.4]
70-79	1,206	76.6	[74.1,79.3]
>=80	373	67.6	[62.4,73.2]
Lesion to treat (in (peri-)pancreas)			
Primary tumour	3,199	79.5	[78.0,81.0]
Relapse of primary tumour	32	NA ^a	NA ^a
Metastasis	40	NA ^a	NA ^a
Primary tumour localisation			
C17.0 Duodenum	175	85.8	[80.2,91.7]
C24.0 Extrahepatic bile duct	243	82.5	[77.4,87.9]
C24.1 (Peri-) ampullary region	397	86.9	[83.2,90.7]
C25.0 Head of pancreas	1,615	75.9	[73.7,78.2]
C25.1 Body of pancreas	280	83.3	[78.7,88.2]
C25.2 Tail of pancreas	330	82.5	[78.2,87.0]
C25.3 Pancreatic duct	13	NA ^a	NA ^a

1 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
C25.7-9 Other specified parts of pancreas	130	71.8	[63.9,80.5]
Other	88	86.0	[78.7,94.0]
Clinical stage			
0	43	NA ^x	NA ^x
I	1,695	79.8	[77.7,81.9]
II	886	77.4	[74.5,80.4]
III	368	81.2	[77.1,85.6]
IV	75	76.4	[67.1,87.0]
X	171	84.5	[78.8,90.6]
TNM not applicable or relapse *	33	NA ^x	NA ^x
Pathological stage			
0	57	98.4	[93.4,103.6]
I	566	86.2	[83.1,89.5]
II	936	79.5	[76.7,82.4]
III	853	74.5	[71.4,77.7]
IV	66	62.6	[51.7,75.8]
X	32	NA ^x	NA ^x
TNM not applicable or relapse *	24	NA ^x	NA ^x
Neoadjuvant treatment °	737	81.1	[78.1,84.1]
yPathological stage			
0	24	NA ^x	NA ^x
I	255	86.8	[82.3,91.4]
II	251	78.9	[73.8,84.5]
III	153	76.9	[70.2,84.2]
IV	42	NA ^x	NA ^x
X	3	NA ^x	NA ^x
TNM not applicable or relapse *	9	NA ^x	NA ^x
No neoadjuvant treatment	2,534	79.3	[77.6,81.0]

1 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Resection margin			
R0	2,233	83.9	[82.2,85.6]
R1	1,027	70.7	[67.8,73.8]
R2	11	NA $\times$	NA $\times$
Prior surgery or endoscopic treatment**			
Prior abdominal surgery	495	79.6	[75.8,83.5]
Other treatment modality (that could affect the pancreas)	586	81.8	[78.5,85.3]
Neoadjuvant treatment			
Chemoradiotherapy	96	78.3	[70.1,87.5]
Chemotherapy	638	81.5	[78.4,84.8]
Radiotherapy	3	NA $\times$	NA $\times$
No chemo or radiation treatment	2,534	79.3	[77.6,81.0]
Charlson Comorbidity Index			
0	1,286	84.8	[82.7,87.0]
1	837	77.5	[74.5,80.6]
2	529	77.1	[73.3,81.1]
3	273	76.8	[71.6,82.3]
4	161	71.1	[64.0,79.0]
5	76	73.1	[63.1,84.7]
6	47	NA $\times$	NA $\times$
7	32	NA $\times$	NA $\times$
8	18	NA $\times$	NA $\times$
9	8	NA $\times$	NA $\times$
10	3	NA $\times$	NA $\times$
WHO score at surgery			
0 - Asymptomatic, normal activity	786	84.4	[81.7,87.2]
1 - Symptomatic, but ambulant	2,040	80.7	[78.8,82.5]

1 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
2 - Symptomatic, bedbound < 50% day	374	67.7	[62.8,73.0]
3 - Symptomatic, bedbound > 50% day	69	62.2	[51.2,75.6]
4 - Completely dependent, 100% bedbound	2	NA	NA
ASA score			
1 - Healthy person	152	85.1	[79.3,91.3]
2 - Mild systemic disease, normal activity	1,630	82.3	[80.3,84.3]
3 - Serious systemic disease, limited activity	1,447	76.3	[74.0,78.7]
4 - Life-threatening illness, handicapped	42	NA	NA
Resectability status			
Before neoadjuvant treatment			
Upfront resectable	141	88.3	[82.7,94.2]
Borderline resectable	389	80.7	[76.5,85.0]
Unresectable	84	83.9	[76.0,92.5]
No neoadjuvant treatment	1,942	80.5	[78.6,82.5]
Before surgery			
Upfront resectable	2,134	81.3	[79.5,83.2]
Borderline resectable	391	79.4	[75.2,83.8]
Unresectable	25	NA	NA
Missing	6	NA	NA
Type of surgery			
Minimally invasive surgery (MIS) - Laparoscopic	672	85.2	[82.4,88.2]
Minimally invasive surgery (MIS) - Hybrid	2	NA	NA
Minimally invasive surgery (MIS) - Robotic	357	81.2	[76.9,85.8]
Open	2,077	78.2	[76.3,80.1]
Conversion from MIS to open surgery	163	72.7	[65.8,80.4]

1 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
<i>Simultaneous venous resection</i>			
No	2,711	81.8	[80.2,83.4]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	560	69.3	[65.4,73.5]
- With primary wedge-reconstruction	189	73.4	[66.8,80.6]
- With primary end-to-end reconstruction	227	65.8	[59.7,72.6]
- With vascular autograft interposition	11	NA $\times$	NA $\times$
- With vascular allograft interposition	69	66.8	[56.2,79.3]
- With synthetic/prosthetic interposition	9	NA $\times$	NA $\times$
- With peritoneal patch wedge-reconstruction	45	NA $\times$	NA $\times$
- Without reconstruction	10	NA $\times$	NA $\times$
<i>Simultaneous arterial resection **</i>			
No	3,195	79.6	[78.1,81.1]
Hepatic artery resection	31	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	18	NA $\times$	NA $\times$
- With vascular allograft interposition	1	NA $\times$	NA $\times$
- Without reconstruction	11	NA $\times$	NA $\times$
Coeliac trunk resection	37	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	2	NA $\times$	NA $\times$
- Without reconstruction	34	NA $\times$	NA $\times$
Superior mesenteric artery (SMA) resection	7	NA $\times$	NA $\times$
- With primary wedge-reconstruction	1	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	3	NA $\times$	NA $\times$
- With vascular autograft interposition	2	NA $\times$	NA $\times$
- Without reconstruction	1	NA $\times$	NA $\times$

		1 year relative survival after surgery, %	
		Belgium	
Characteristic	N	%	95% CI
<i>Simultaneous other organ resection **</i>			
No	2,018	79.6	[77.7,81.6]
Colon	97	69.7	[60.8,80.0]
Stomach	553	78.4	[74.8,82.2]
Adrenal gland	79	85.0	[77.0,93.8]
Spleen	622	81.2	[77.9,84.6]
Other	191	76.7	[70.6,83.4]
<i>RIZIV code for complex surgery</i>			
242830-242841: Pancreaticoduodenectomy	2,588	78.8	[77.1,80.5]
Pancreaticoduodenectomy	2,389	79.4	[77.7,81.2]
Total Pancreatectomy	199	71.8	[65.4,78.9]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	210	85.2	[80.2,90.6]
242874-242885: Hemipancreatectomy left	470	82.2	[78.5,86.1]
242896-242900: Enucleation of a pancreatic tumour	3	NA α	NA α
<i>Antithrombotic medication</i>			
No	2,246	81.7	[80.0,83.5]
Yes	1,025	75.2	[72.4,78.2]
<i>Was the patient referred?</i>			
No	1,364	81.4	[79.2,83.7]
Yes	1,907	78.4	[76.5,80.5]

*: Tumour staging not possible.

°: Neoadjuvant treatment: patients who received either chemotherapy or radiotherapy, or a combination of these treatments prior to surgery.

** : Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

α : N<50

⌘⌘: 3-year follow-up after surgery is not reached.

Table 25. Unadjusted 3-year relative survival after surgery for **adenocarcinoma** in the six convention years.

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Operated patients with adenocarcinoma	3,271	49.5	[47.4,51.7]
Convention year			
Year 1	476	48.7	[44.2,53.8]
Year 2	554	48.8	[44.5,53.4]
Year 3	552	46.0	[41.8,50.7]
Year 4	545	48.0	[43.4,53.2]
Year 5	579	NAxx	NAxx
Year 6	565	NAxx	NAxx
Sex			
Male	1,763	49.6	[46.8,52.7]
Female	1,508	49.3	[46.3,52.5]
Age at surgery			
<=69	1,692	52.9	[50.1,55.8]
70-79	1,206	48.3	[44.9,52.0]
>=80	373	37.9	[31.5,45.6]
Lesion to treat (in (peri-)pancreas)			
Primary tumour	3,199	49.0	[46.9,51.2]
Relapse of primary tumour	32	NAxx	NAxx
Metastasis	40	NAxx	NAxx
Primary tumour localisation			
C17.0 Duodenum	175	73.4	[65.4,82.5]
C24.0 Extrahepatic bile duct	243	50.3	[42.9,58.8]
C24.1 (Peri-) ampullary region	397	68.4	[62.6,74.7]
C25.0 Head of pancreas	1,615	41.0	[38.2,44.1]
C25.1 Body of pancreas	280	51.4	[44.5,59.4]
C25.2 Tail of pancreas	330	48.6	[42.3,55.8]
C25.3 Pancreatic duct	13	NAxx	NAxx

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
C25.7-9 Other specified parts of pancreas	130	46.9	[37.6,58.5]
Other	88	68.3	[58.0,80.6]
Clinical stage			
0	43	NA	NA
I	1,695	51.9	[49.0,55.0]
II	886	42.5	[38.6,46.7]
III	368	46.5	[40.7,53.2]
IV	75	50.3	[38.9,65.0]
X	171	61.2	[53.1,70.6]
TNM not applicable or relapse *	33	NA	NA
Pathological stage			
0	57	101.7	[95.0,109.0]
I	566	72.9	[68.2,77.9]
II	936	47.8	[43.9,52.1]
III	853	38.1	[34.3,42.4]
IV	66	30.4	[20.4,45.1]
X	32	NA	NA
TNM not applicable or relapse *	24	NA	NA
Neoadjuvant treatment °	737	44.7	[40.5,49.4]
yPathological stage			
0	24	NA	NA
I	255	56.9	[49.9,64.9]
II	251	35.7	[29.0,44.0]
III	153	36.9	[28.7,47.3]
IV	42	NA	NA
X	3	NA	NA
TNM not applicable or relapse *	9	NA	NA
No neoadjuvant treatment	2,534	50.9	[48.5,53.4]

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
Resection margin			
R0	2,233	56.7	[54.1,59.3]
R1	1,027	34.5	[31.0,38.3]
R2	11	NA $\times$	NA $\times$
Prior surgery or endoscopic treatment**			
Prior abdominal surgery	495	50.1	[44.9,56.0]
Other treatment modality (that could affect the pancreas)	586	46.6	[41.7,52.1]
Neoadjuvant treatment			
Chemoradiotherapy	96	58.3	[47.5,71.5]
Chemotherapy	638	42.9	[38.4,47.9]
Radiotherapy	3	NA $\times$	NA $\times$
No chemo or radiation treatment	2,534	50.9	[48.5,53.4]
Charlson Comorbidity Index			
0	1,286	58.1	[54.9,61.6]
1	837	45.1	[41.0,49.6]
2	529	42.7	[37.7,48.3]
3	273	45.2	[38.6,53.0]
4	161	37.1	[28.8,47.9]
5	76	48.1	[35.9,64.5]
6	47	NA $\times$	NA $\times$
7	32	NA $\times$	NA $\times$
8	18	NA $\times$	NA $\times$
9	8	NA $\times$	NA $\times$
10	3	NA $\times$	NA $\times$
WHO score at surgery			
0 - Asymptomatic, normal activity	786	55.5	[51.2,60.2]
1 - Symptomatic, but ambulant	2,040	50.2	[47.6,53.0]

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
2 - Symptomatic, bedbound < 50% day	374	36.0	[30.3,42.8]
3 - Symptomatic, bedbound > 50% day	69	32.9	[21.8,49.8]
4 - Completely dependent, 100% bedbound	2	NA	NA
ASA score			
1 - Healthy person	152	57.8	[49.7,67.2]
2 - Mild systemic disease, normal activity	1,630	53.6	[50.7,56.7]
3 - Serious systemic disease, limited activity	1,447	44.3	[41.1,47.7]
4 - Life-threatening illness, handicapped	42	NA	NA
Resectability status			
Before neoadjuvant treatment			
Upfront resectable	141	51.3	[41.4,63.4]
Borderline resectable	389	44.5	[38.4,51.4]
Unresectable	84	45.4	[34.0,60.7]
No neoadjuvant treatment	1,942	51.3	[48.5,54.4]
Before surgery			
Upfront resectable	2,134	51.9	[49.2,54.9]
Borderline resectable	391	42.8	[36.9,49.5]
Unresectable	25	NA	NA
Missing	6	NA	NA
Type of surgery			
Minimally invasive surgery (MIS) - Laparoscopic	672	54.1	[49.7,58.9]
Minimally invasive surgery (MIS) - Hybrid	2	NA	NA
Minimally invasive surgery (MIS) - Robotic	357	49.6	[42.5,57.9]
Open	2,077	48.9	[46.4,51.7]
Conversion from MIS to open surgery	163	36.0	[27.9,46.5]

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
<i>Simultaneous venous resection</i>			
No	2,711	53.6	[51.2,56.0]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	560	30.0	[25.6,35.1]
- With primary wedge-reconstruction	189	27.4	[20.2,37.2]
- With primary end-to-end reconstruction	227	30.8	[24.6,38.6]
- With vascular autograft interposition	11	NA $\times$	NA $\times$
- With vascular allograft interposition	69	18.1	[8.6,37.8]
- With synthetic/prosthetic interposition	9	NA $\times$	NA $\times$
- With peritoneal patch wedge-reconstruction	45	NA $\times$	NA $\times$
- Without reconstruction	10	NA $\times$	NA $\times$
<i>Simultaneous arterial resection **</i>			
No	3,195	49.8	[47.6,52.0]
Hepatic artery resection	31	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	18	NA $\times$	NA $\times$
- With vascular allograft interposition	1	NA $\times$	NA $\times$
- Without reconstruction	11	NA $\times$	NA $\times$
Coeliac trunk resection	37	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	2	NA $\times$	NA $\times$
- Without reconstruction	34	NA $\times$	NA $\times$
Superior mesenteric artery (SMA) resection	7	NA $\times$	NA $\times$
- With primary wedge-reconstruction	1	NA $\times$	NA $\times$
- With primary end-to-end reconstruction	3	NA $\times$	NA $\times$
- With vascular autograft interposition	2	NA $\times$	NA $\times$
- Without reconstruction	1	NA $\times$	NA $\times$

3 year relative survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
<i>Simultaneous other organ resection **</i>			
No	2,018	50.0	[47.3,52.8]
Colon	97	39.9	[30.2,52.8]
Stomach	553	46.7	[41.9,52.1]
Adrenal gland	79	40.7	[29.7,55.6]
Spleen	622	47.6	[42.9,53.0]
Other	191	50.1	[42.3,59.3]
<i>RIZIV code for complex surgery</i>			
242830-242841: Pancreaticoduodenectomy	2,588	49.1	[46.7,51.6]
Pancreaticoduodenectomy	2,389	49.6	[47.2,52.2]
Total Pancreatectomy	199	41.8	[33.9,51.6]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	210	50.8	[43.3,59.7]
242874-242885: Hemipancreatectomy left	470	51.2	[45.7,57.4]
242896-242900: Enucleation of a pancreatic tumour	3	NA α	NA α
<i>Antithrombotic medication</i>			
No	2,246	52.3	[49.8,54.9]
Yes	1,025	43.3	[39.5,47.3]
<i>Was the patient referred?</i>			
No	1,364	50.4	[47.1,53.9]
Yes	1,907	48.9	[46.2,51.7]

*: Tumour staging not possible.

°: Neoadjuvant treatment: patients who received either chemotherapy or radiotherapy, or a combination of these treatments prior to surgery.

** : Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

α : N<50

⌘⌘: 3-year follow-up after surgery is not reached.

Figure 20. Unadjusted 1-year relative survival after surgery for **adenocarcinoma** for all years combined.

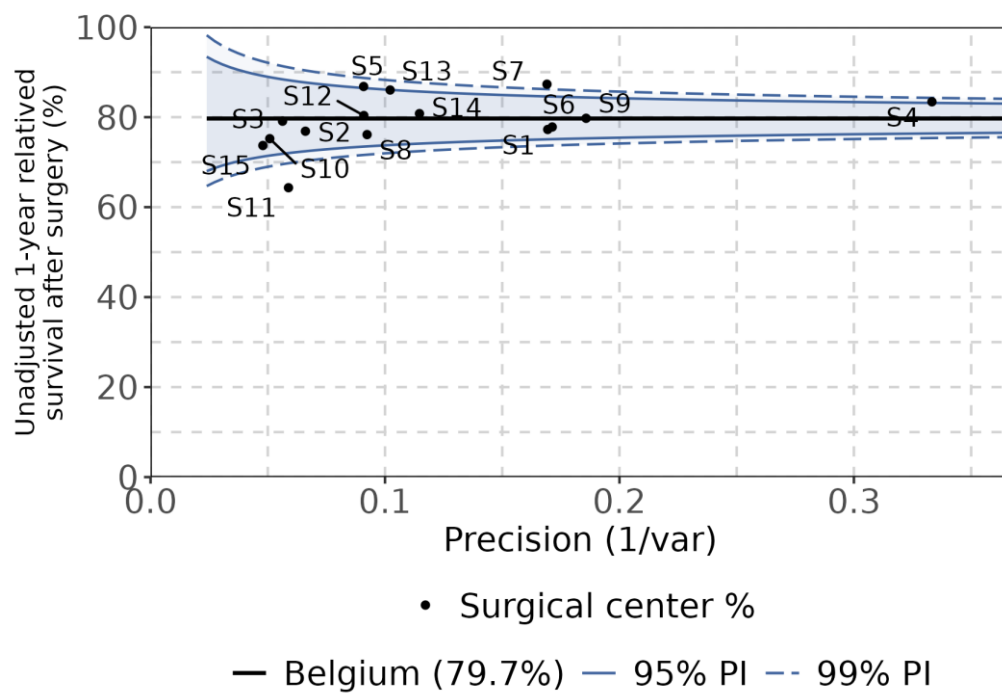


Figure 21. Unadjusted 3-year relative survival after surgery for **adenocarcinoma** for all years combined.

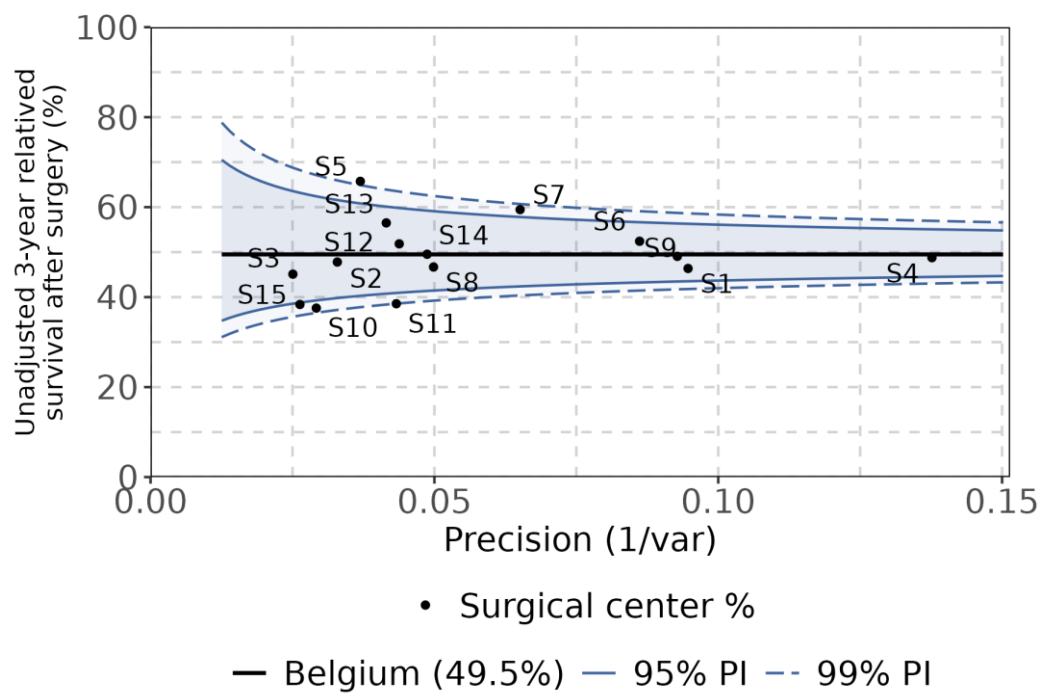


Table 26. Proportion of operated patients with **pancreatic ductal adenocarcinoma** in the six convention years with resection margin R0, R1 and R2.

Belgium				
Resection margin	N	n	n/N (%)	95% CI
Operated patients with pancreatic ductal adenocarcinoma				
Convention year				
Year 1	288			
Year 2	364			
Year 3	349			
Year 4	351			
Year 5	407			
Year 6	374			
Resection margin status				
R0	2,133	1,295	60.71	[58.6, 62.8]
- With simultaneous vascular resection		248		
- Without simultaneous vascular resection		1,047		
R1 indirect	2,133	564	26.44	[24.6, 28.4]
- With simultaneous vascular resection		166		
- Without simultaneous vascular resection		398		
R1 direct	2,133	265	12.42	[11.1, 13.9]
- With simultaneous vascular resection		94		
- Without simultaneous vascular resection		171		
R2	2,133	9	0.42	[0.2, 0.8]
- With simultaneous vascular resection		3		
- Without simultaneous vascular resection		6		

R0: tumour-free resection margin > 1mm

R1 indirect: tumour-free resection margin ≤ 1mm

R1 direct: microscopic tumour involvement of the resection margin

R2: macroscopic tumour transection

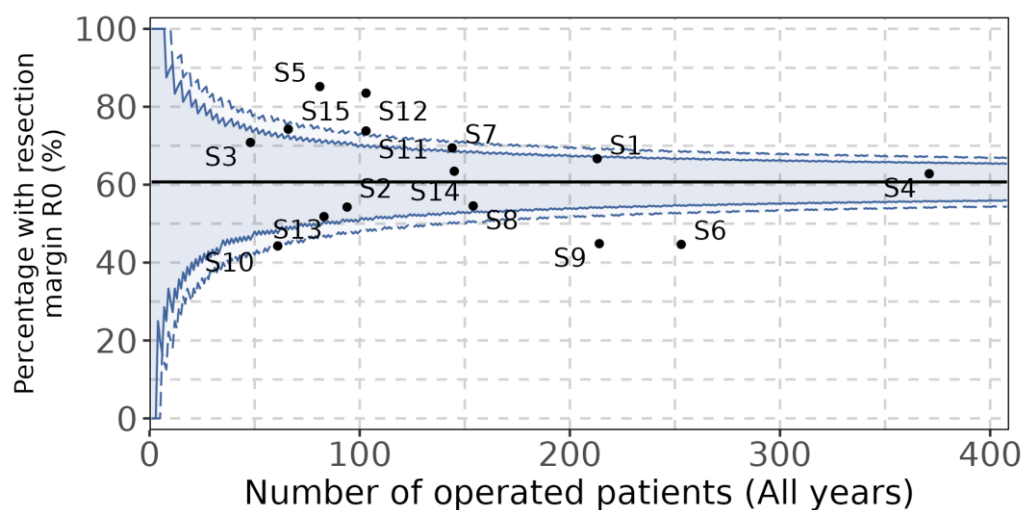
Remark: Enucleation is regarded as a R1 resection

Remark: Reduced absolute number of patients is due to the specific selection of 'pancreatic ductal adenocarcinoma' (i.e. ICD-O-3 selection applied: topography C25, morphology 8500/3)

Remark: Patients with R1 without specification direct or indirect were excluded from the table

Figure 22. Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin R0, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

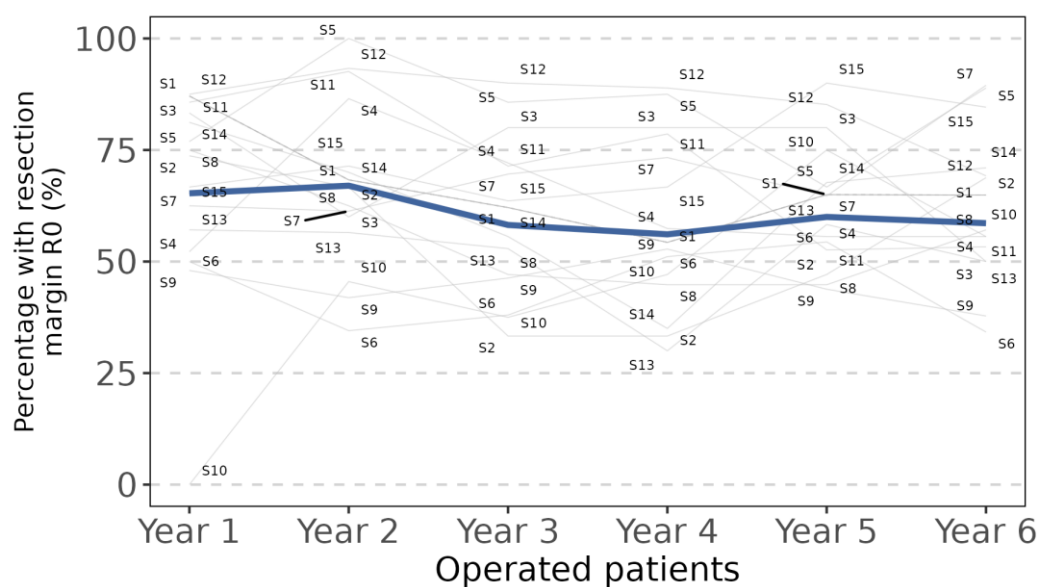
a)



• Surgical center %

— Belgium (60.7%) — 95% -- 99%

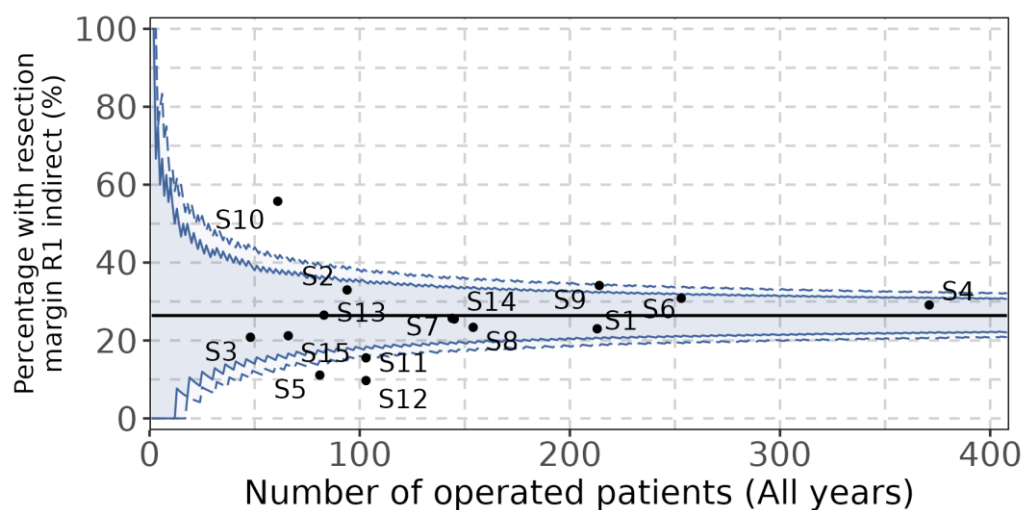
b)



— Belgium — Surgical centers

Figure 23. Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 indirect**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

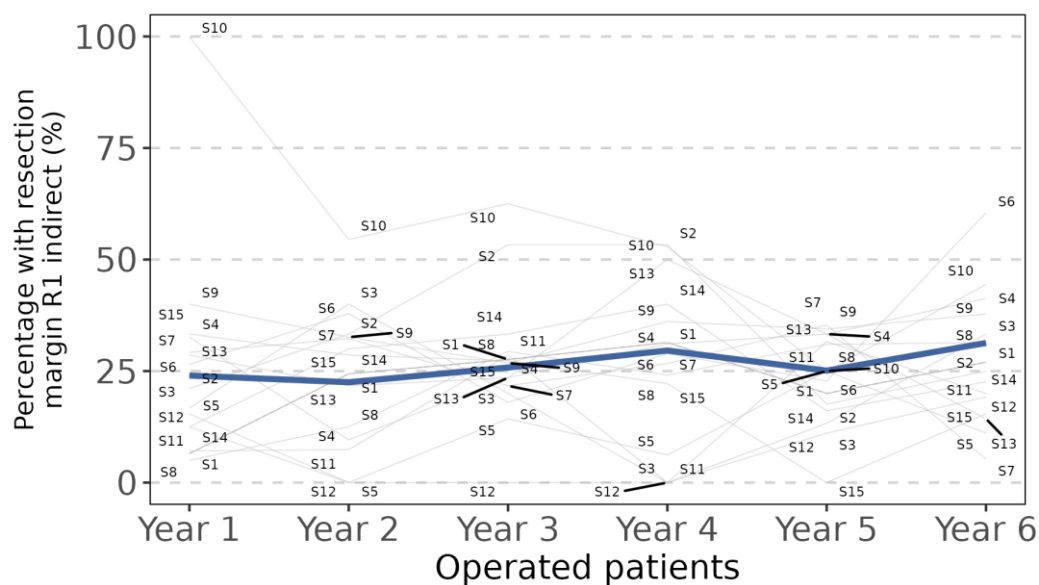
a)



• Surgical center %

— Belgium (26.4%) — 95% -- 99%

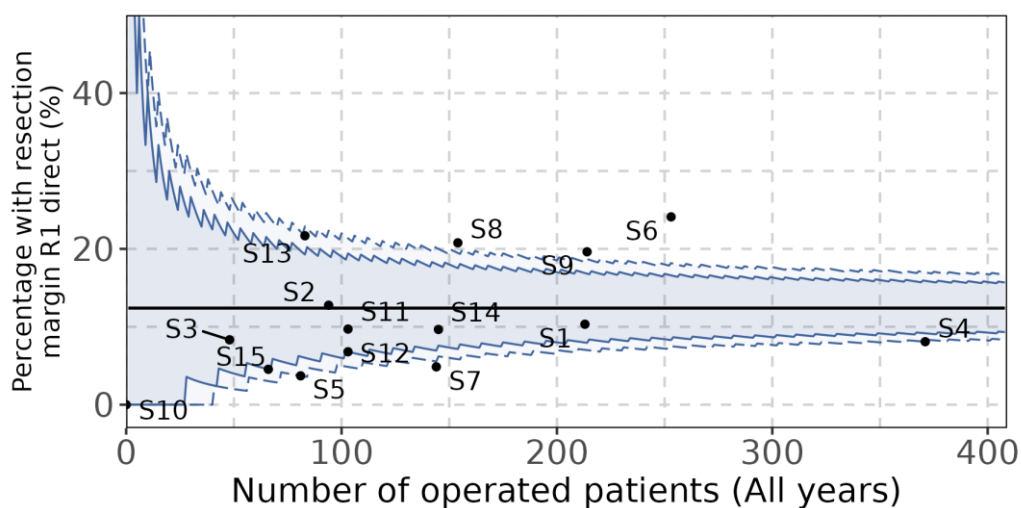
b)



— Belgium — Surgical centers

Figure 24. Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 direct**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

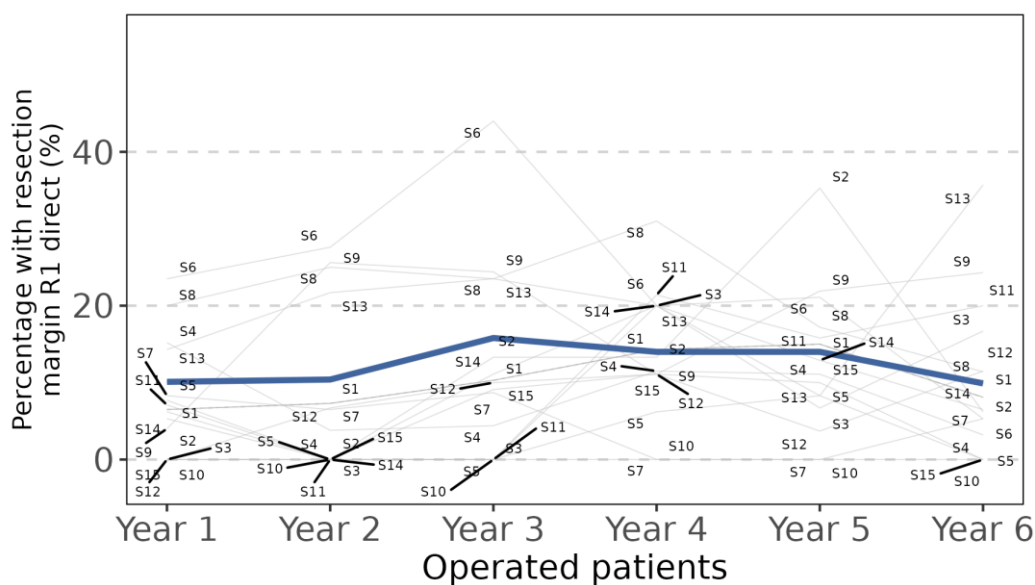
a)



• Surgical center %

— Belgium (12.4%) — 95% -- 99%

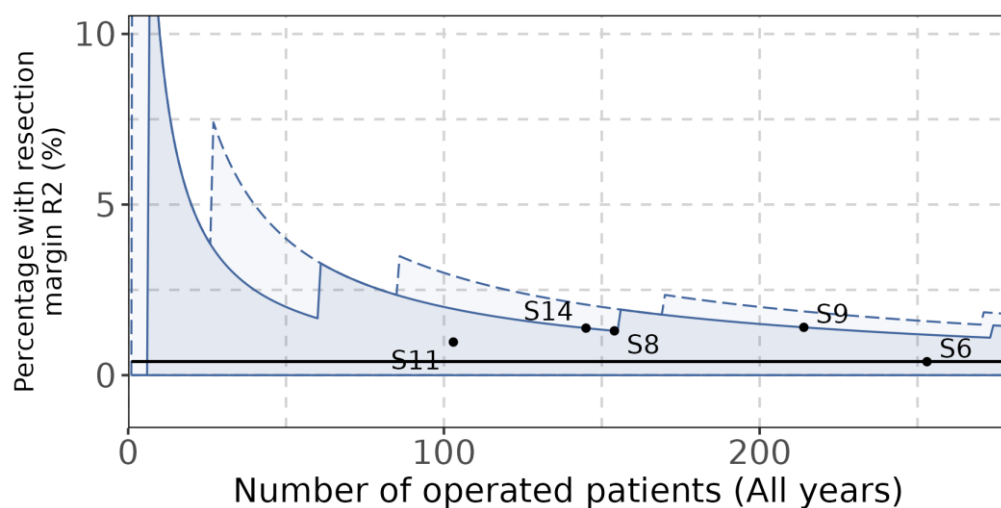
b)



— Belgium — Surgical centers

Figure 25. Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R2**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

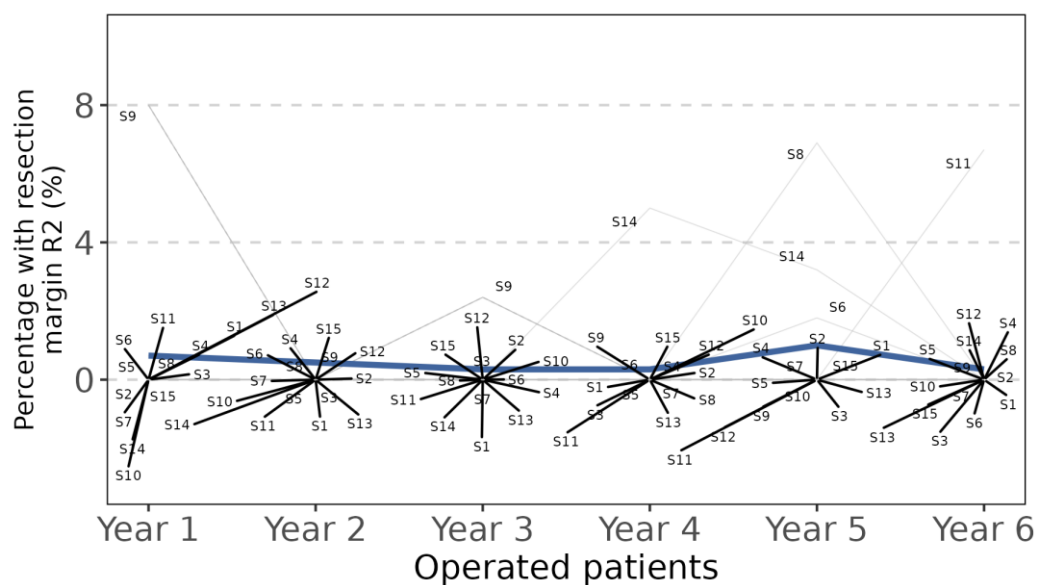
a)



• Surgical center %

— Belgium (0.4%) — 95% — 99%

b)



— Belgium — Surgical centers

3.3.4. Proportion of operated patients with surgical complications

Note that in-hospital is defined as the days the patient was hospitalised between the date of surgery and 90 days post-surgery.

Table 27. Proportion of operated patients (**malignant and benign tumours**) in the six convention years with surgical complications (90-day postoperative, in-hospital), by complication type.

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Severe postoperative complications (CD IIIB-V)	5,071	762	15.0	[14.1, 16.0]
Year 1	724	98	13.5	[11.1, 16.2]
Year 2	856	114	13.3	[11.1, 15.8]
Year 3	851	125	14.7	[12.4, 17.2]
Year 4	834	112	13.4	[11.2, 15.9]
Year 5	913	160	17.5	[15.1, 20.1]
Year 6	893	153	17.1	[14.7, 19.8]
Clinically relevant pancreatic fistula (Grade B or C) 1*	5,071	995	19.6	[18.5, 20.7]
Grade B	5,071	902	17.8	[16.7, 18.9]
Year 1	724	120	16.6	[13.9, 19.5]
Year 2	856	151	17.6	[15.1, 20.4]
Year 3	851	142	16.7	[14.2, 19.4]
Year 4	834	144	17.3	[14.8, 20.0]
Year 5	913	194	21.2	[18.6, 24.0]
Year 6	893	151	16.9	[14.5, 19.5]
Grade C	5,071	93	1.8	[1.5, 2.2]
Year 1	724	15	2.1	[1.2, 3.4]
Year 2	856	15	1.8	[1.0, 2.9]
Year 3	851	26	3.1	[2.0, 4.4]
Year 4	834	10	1.2	[0.6, 2.2]
Year 5	913	11	1.2	[0.6, 2.1]
Year 6	893	16	1.8	[1.0, 2.9]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
<i>Haemorrhage (Grade A, B or C) 2*</i>	5,071	455	9.0	[8.2, 9.8]
Grade A	5,071	103	2.0	[1.7, 2.5]
Year 1	724	14	1.9	[1.1, 3.2]
Year 2	856	17	2.0	[1.2, 3.2]
Year 3	851	15	1.8	[1.0, 2.9]
Year 4	834	12	1.4	[0.7, 2.5]
Year 5	913	26	2.8	[1.9, 4.1]
Year 6	893	19	2.1	[1.3, 3.3]
Grade B	5,071	215	4.2	[3.7, 4.8]
Year 1	724	22	3.0	[1.9, 4.6]
Year 2	856	45	5.3	[3.9, 7.0]
Year 3	851	28	3.3	[2.2, 4.7]
Year 4	834	26	3.1	[2.0, 4.5]
Year 5	913	43	4.7	[3.4, 6.3]
Year 6	893	51	5.7	[4.3, 7.4]
Grade C	5,071	137	2.7	[2.3, 3.2]
Year 1	724	26	3.6	[2.4, 5.2]
Year 2	856	24	2.8	[1.8, 4.1]
Year 3	851	23	2.7	[1.7, 4.0]
Year 4	834	19	2.3	[1.4, 3.5]
Year 5	913	23	2.5	[1.6, 3.8]
Year 6	893	22	2.5	[1.6, 3.7]
<i>Delayed gastric emptying (Grade A, B or C) 3*</i>	5,071	890	17.6	[16.5, 18.6]
Grade A	5,071	439	8.7	[7.9, 9.5]
Year 1	724	50	6.9	[5.2, 9.0]
Year 2	856	76	8.9	[7.1, 11.0]
Year 3	851	67	7.9	[6.2, 9.9]
Year 4	834	63	7.6	[5.9, 9.6]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 5	913	82	9.0	[7.2, 11.0]
Year 6	893	101	11.3	[9.3, 13.6]
Grade B	5,071	320	6.3	[5.7, 7.0]
Year 1	724	43	5.9	[4.3, 7.9]
Year 2	856	42	4.9	[3.6, 6.6]
Year 3	851	52	6.1	[4.6, 7.9]
Year 4	834	46	5.5	[4.1, 7.3]
Year 5	913	71	7.8	[6.1, 9.7]
Year 6	893	66	7.4	[5.8, 9.3]
Grade C	5,071	131	2.6	[2.2, 3.1]
Year 1	724	16	2.2	[1.3, 3.6]
Year 2	856	18	2.1	[1.3, 3.3]
Year 3	851	25	2.9	[1.9, 4.3]
Year 4	834	23	2.8	[1.8, 4.1]
Year 5	913	31	3.4	[2.3, 4.8]
Year 6	893	18	2.0	[1.2, 3.2]
<i>Bile leakage (Grade A, B or C) 4*</i>	5,071	176	3.5	[3.0, 4.0]
Grade A	5,071	56	1.1	[0.8, 1.4]
Year 1	724	8	1.1	[0.5, 2.2]
Year 2	856	9	1.1	[0.5, 2.0]
Year 3	851	10	1.2	[0.6, 2.2]
Year 4	834	11	1.3	[0.7, 2.3]
Year 5	913	5	0.5	[0.2, 1.3]
Year 6	893	13	1.5	[0.8, 2.5]
Grade B	5,071	57	1.1	[0.9, 1.5]
Year 1	724	5	0.7	[0.2, 1.6]
Year 2	856	9	1.1	[0.5, 2.0]
Year 3	851	10	1.2	[0.6, 2.2]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 4	834	13	1.6	[0.8, 2.7]
Year 5	913	8	0.9	[0.4, 1.7]
Year 6	893	12	1.3	[0.7, 2.3]
Grade C	5,071	63	1.2	[1.0, 1.6]
Year 1	724	8	1.1	[0.5, 2.2]
Year 2	856	6	0.7	[0.3, 1.5]
Year 3	851	10	1.2	[0.6, 2.2]
Year 4	834	11	1.3	[0.7, 2.3]
Year 5	913	17	1.9	[1.1, 3.0]
Year 6	893	11	1.2	[0.6, 2.2]
<i>Intra-abdominal abscess *</i>	5,071	326	6.4	[5.8, 7.1]
Year 1	724	43	5.9	[4.3, 7.9]
Year 2	856	45	5.3	[3.9, 7.0]
Year 3	851	54	6.3	[4.8, 8.2]
Year 4	834	60	7.2	[5.5, 9.2]
Year 5	913	60	6.6	[5.1, 8.4]
Year 6	893	64	7.2	[5.6, 9.1]
<i>Transferred to another hospital due to complications (CD I-IVb)</i>	5,071	3	0.1	[0.0, 0.2]
Year 1	724	2	0.3	[0.0, 1.0]
Year 2	856	0	0.0	[0.0, 0.4]
Year 3	851	0	0.0	[0.0, 0.4]
Year 4	834	1	0.1	[0.0, 0.7]
Year 5	913	0	0.0	[0.0, 0.4]
Year 6	893	0	0.0	[0.0, 0.4]

CD: Clavien-Dindo grade

1: graded according to the 2016 update of the International Study Group of Pancreatic Surgery (ISGPS)

2: graded according to the ISGPS definitions

3: graded according to the ISGPS definitions

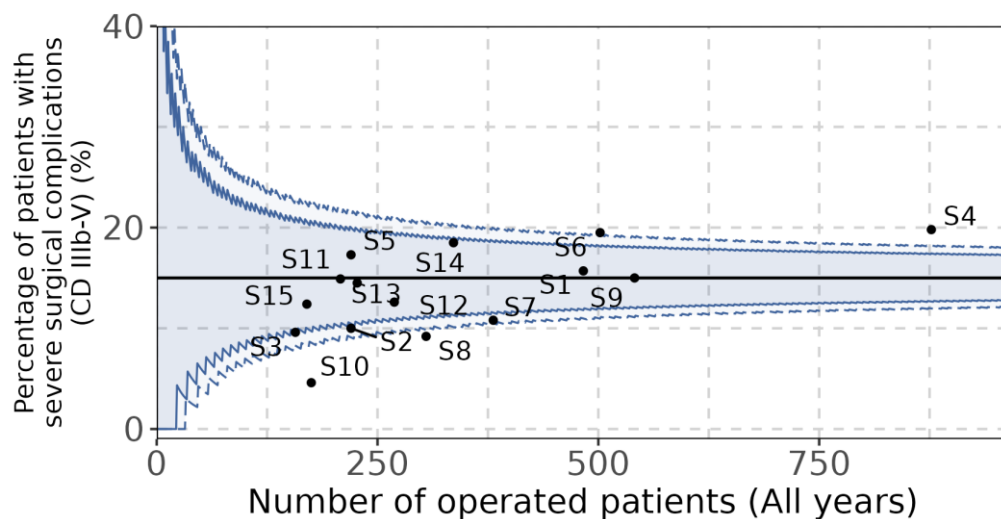
4: graded according to the International Study Group of Liver Surgery (ISGLS)

More information can be found in the project manual.

**: Patients could have a combination of complications, thus the total number of complications could be larger than the total number of patients.*

Figure 26. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **severe surgical complications** (CD IIIb-V), per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

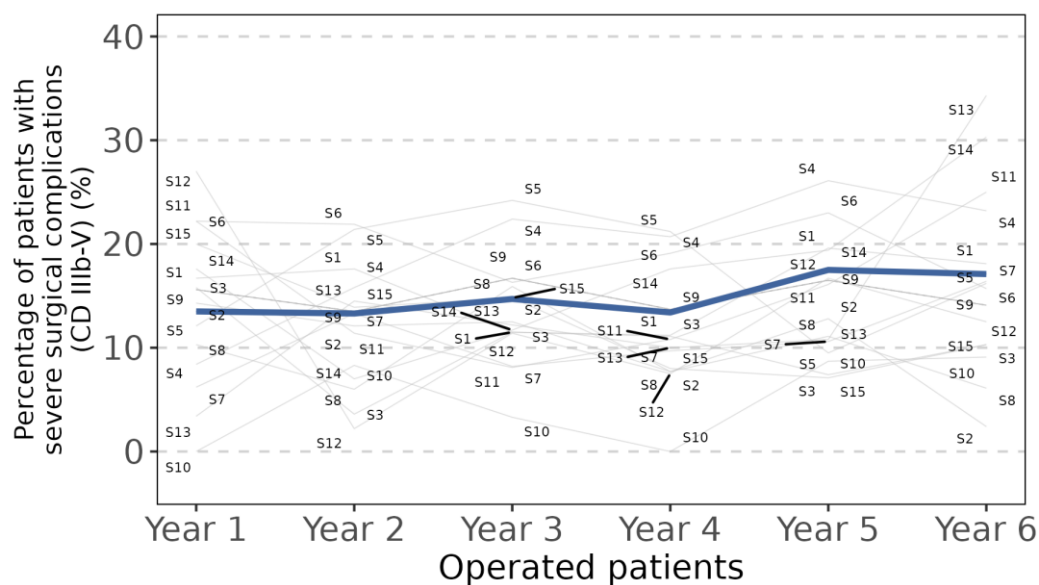
a)



• Surgical center %

— Belgium (15.0%) — 95% -- 99%

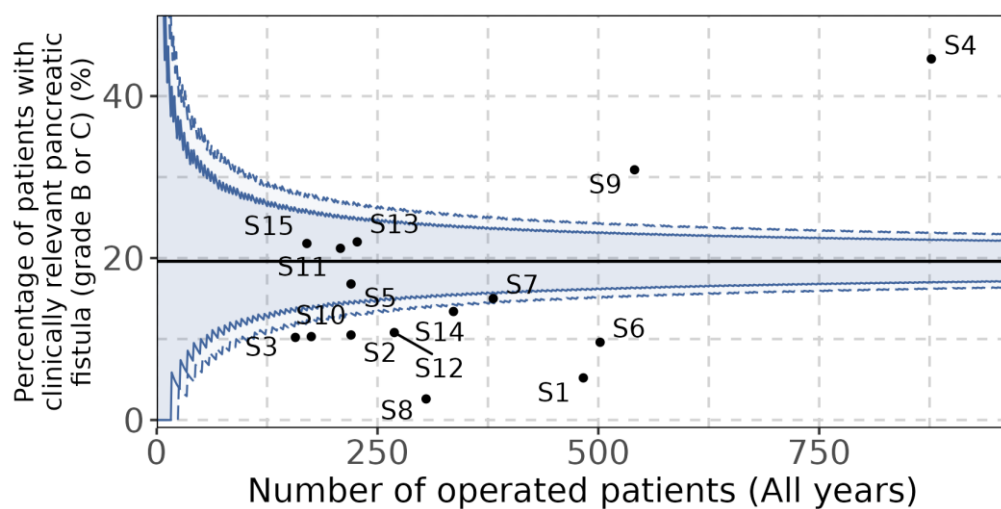
b)



— Belgium — Surgical centers

Figure 27. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

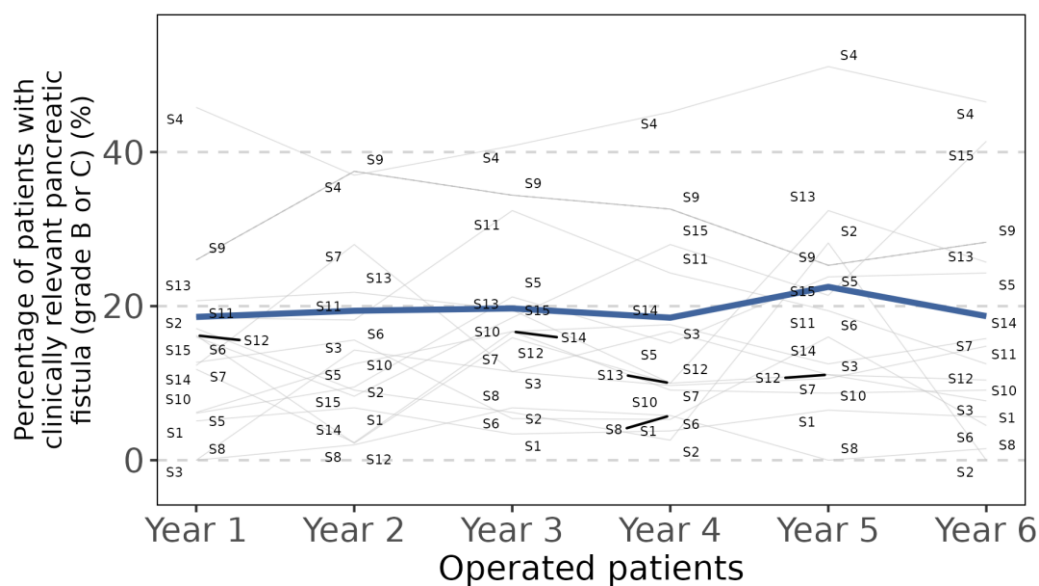
a)



• Surgical center %

— Belgium (19.6%) — 95% -- 99%

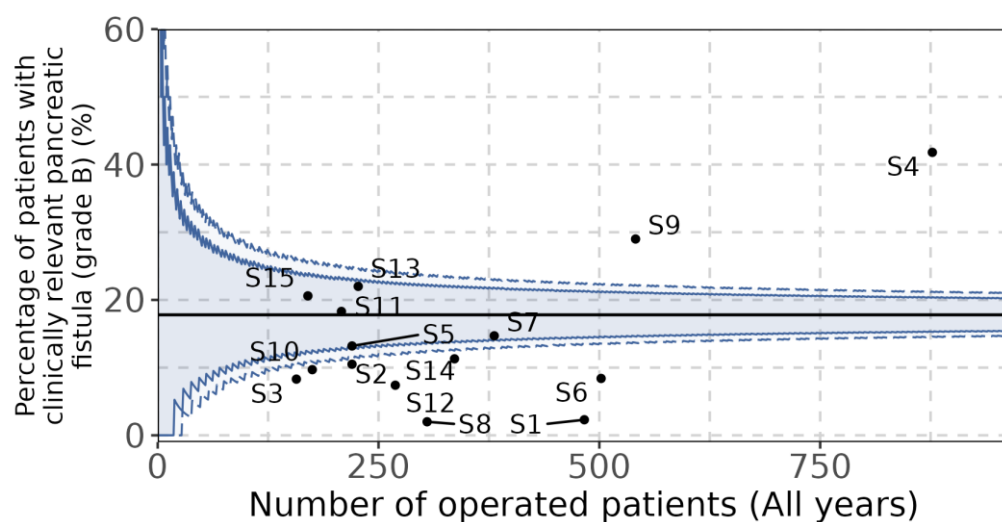
b)



— Belgium — Surgical centers

Figure 28. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

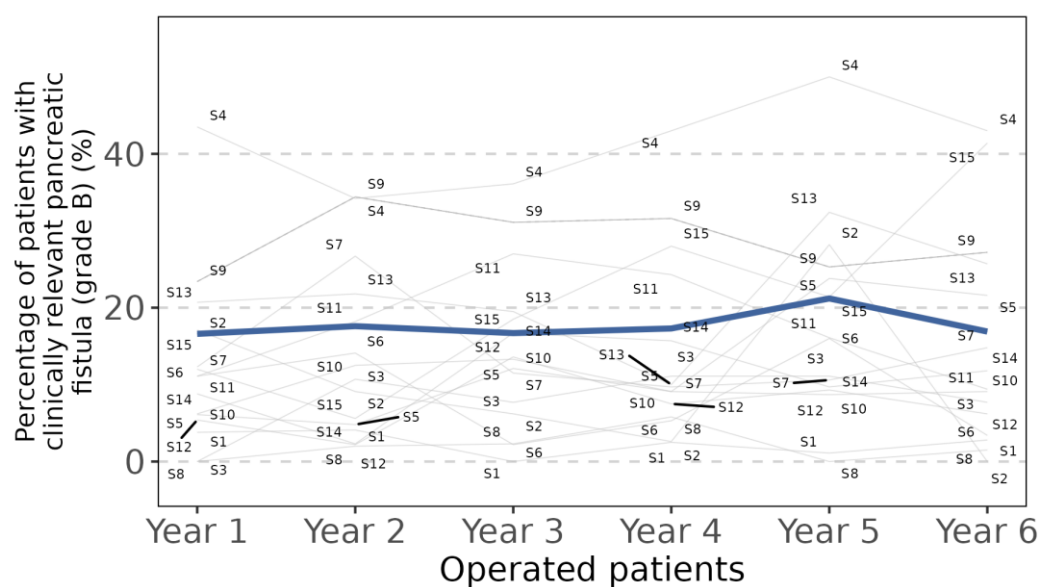
a)



• Surgical center %

— Belgium (17.8%) — 95% -- 99%

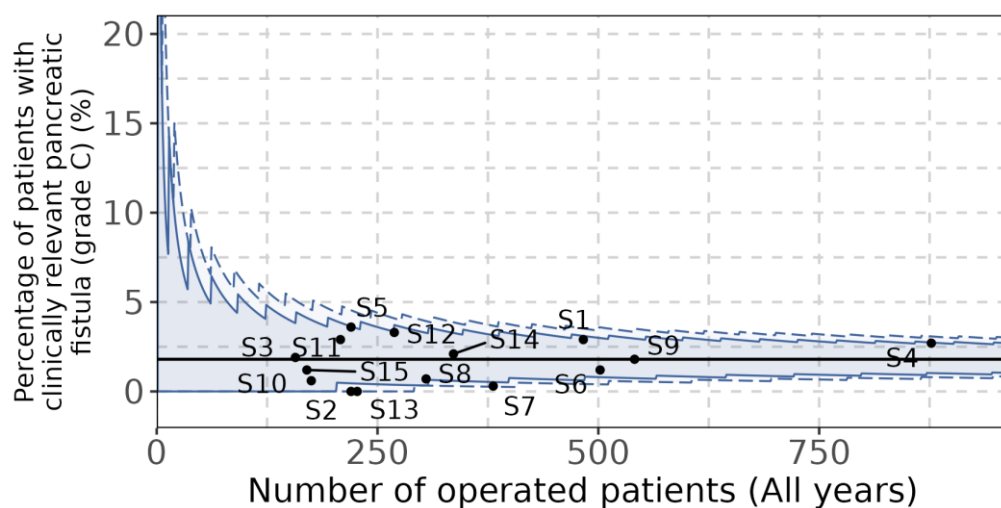
b)



— Belgium — Surgical centers

Figure 29. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

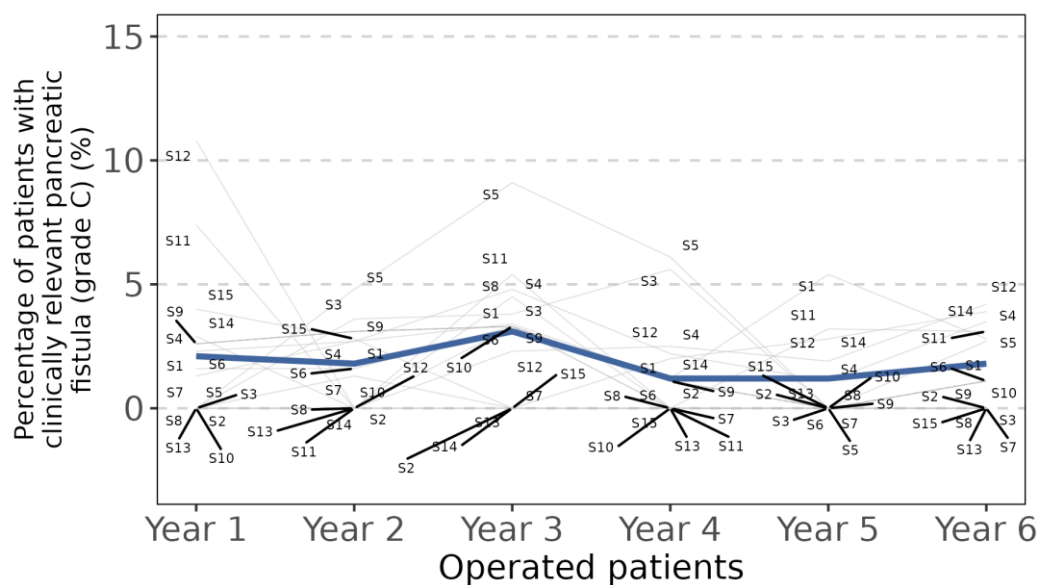
a)



• Surgical center %

— Belgium (1.8%) — 95% - - 99%

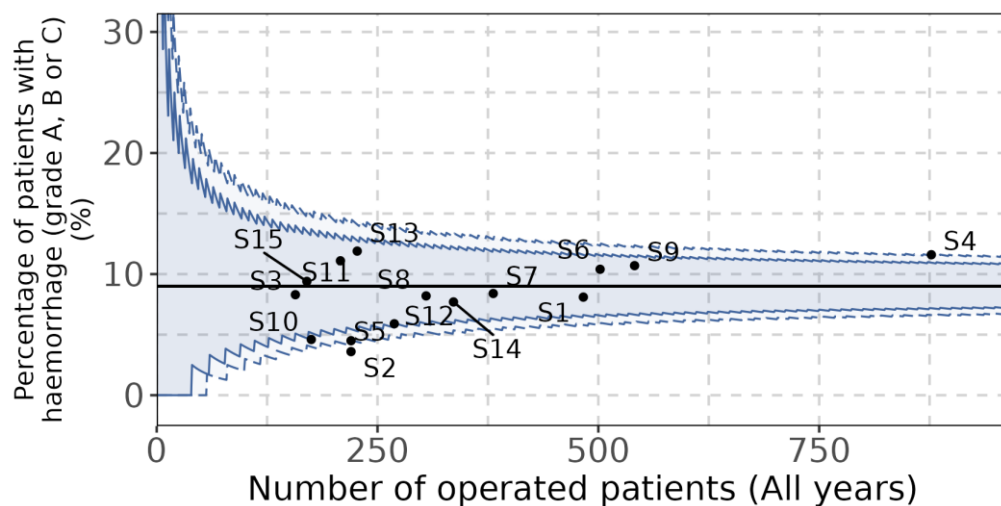
b)



— Belgium — Surgical centers

Figure 30. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

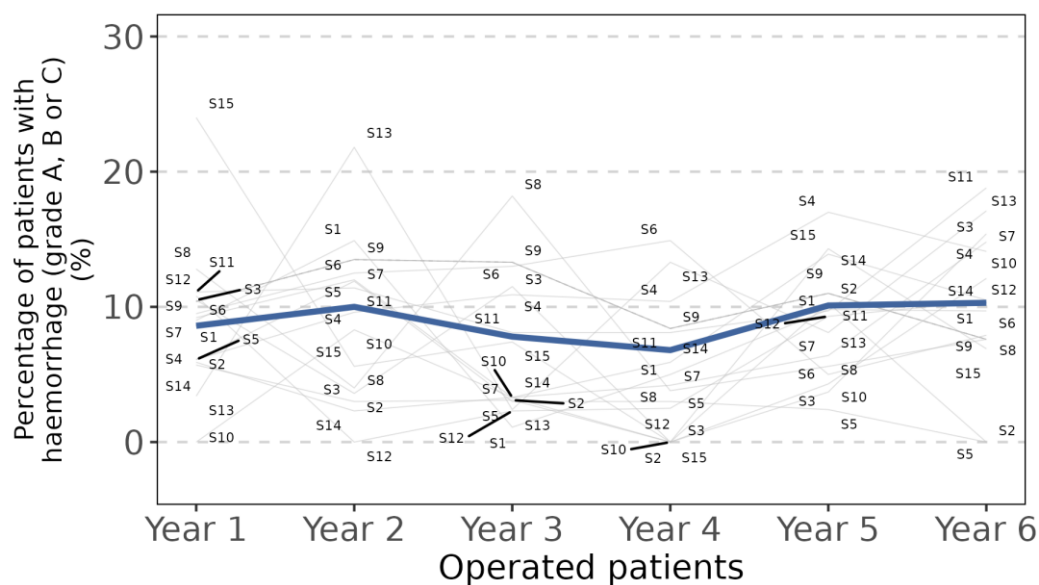
a)



• Surgical center %

— Belgium (9.0%) — 95% -- 99%

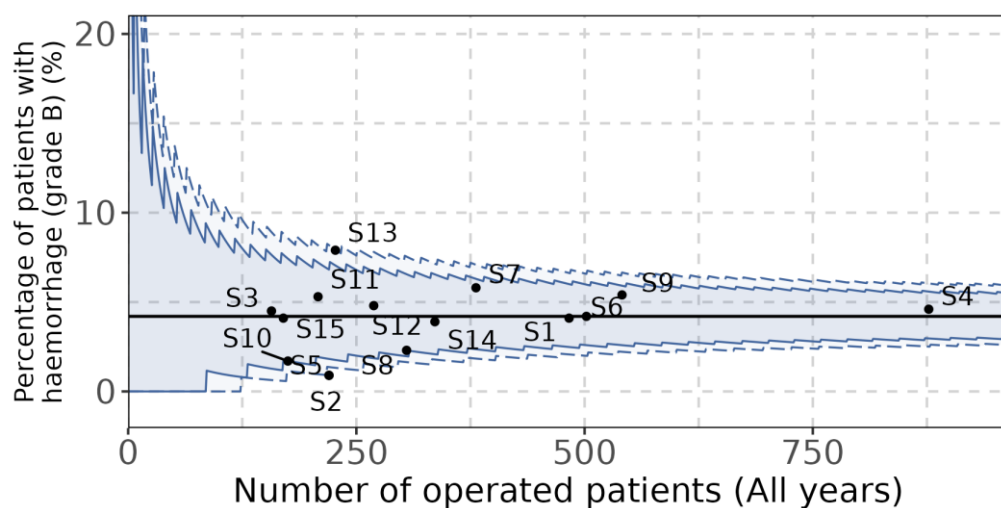
b)



— Belgium — Surgical centers

Figure 31. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with haemorrhage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

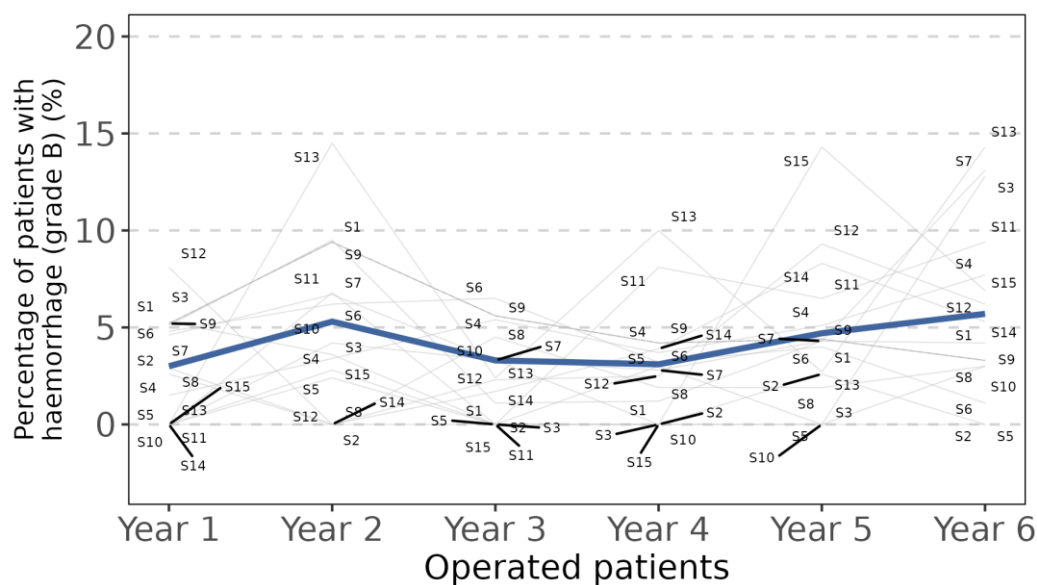
a)



• Surgical center %

— Belgium (4.2%) — 95% -- 99%

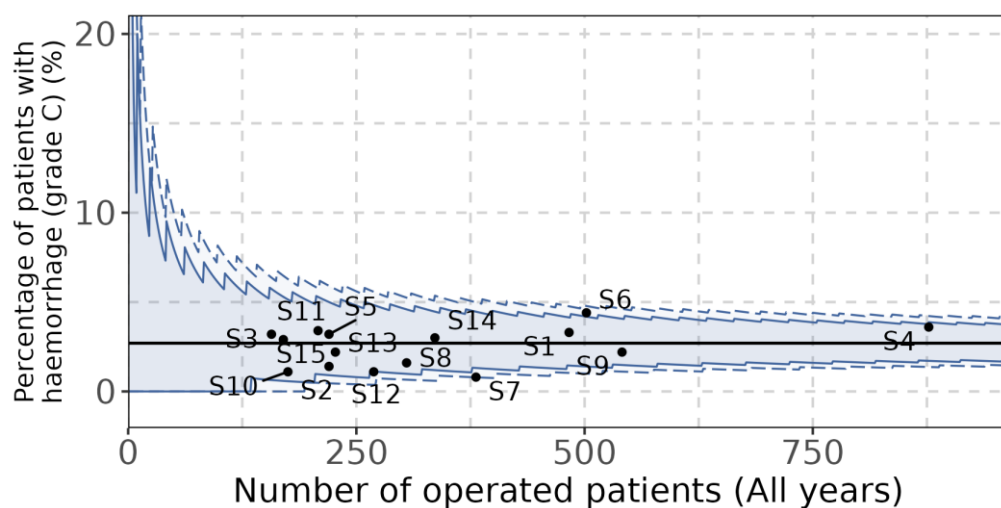
b)



— Belgium — Surgical centers

Figure 32. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with haemorrhage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

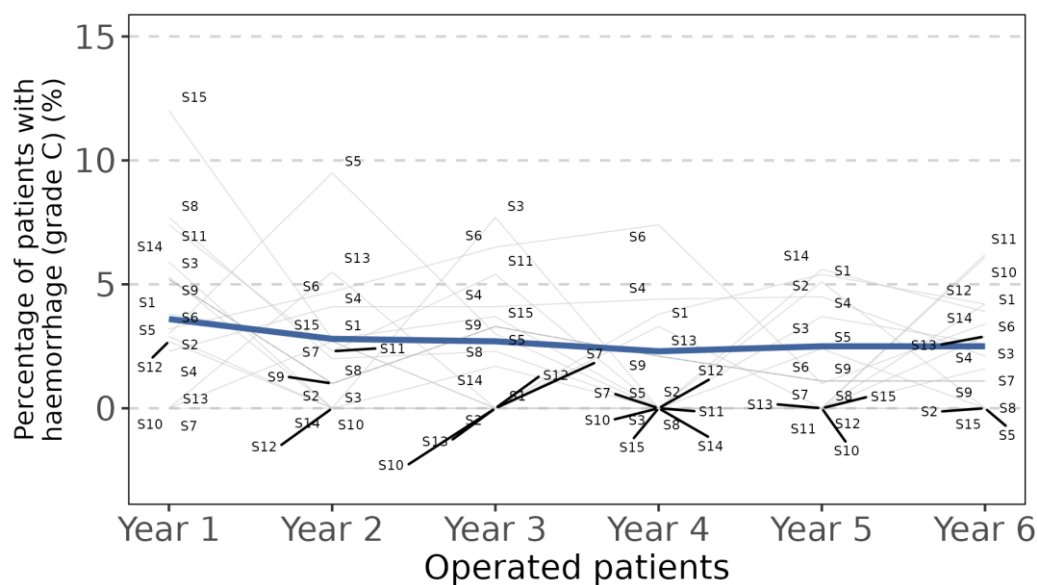
a)



• Surgical center %

— Belgium (2.7%) — 95% -- 99%

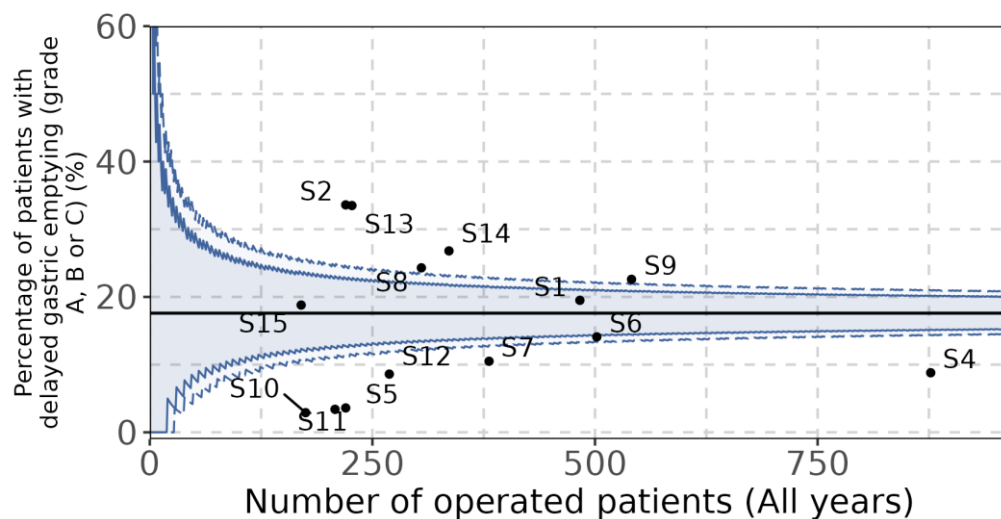
b)



— Belgium — Surgical centers

Figure 33. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

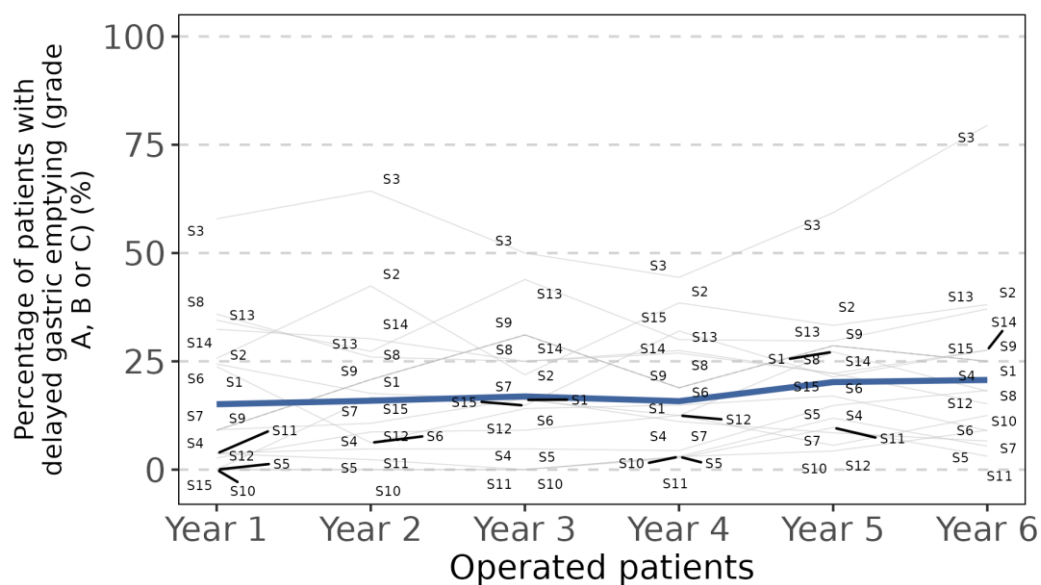
a)



• Surgical center %

— Belgium (17.6%) — 95% -- 99%

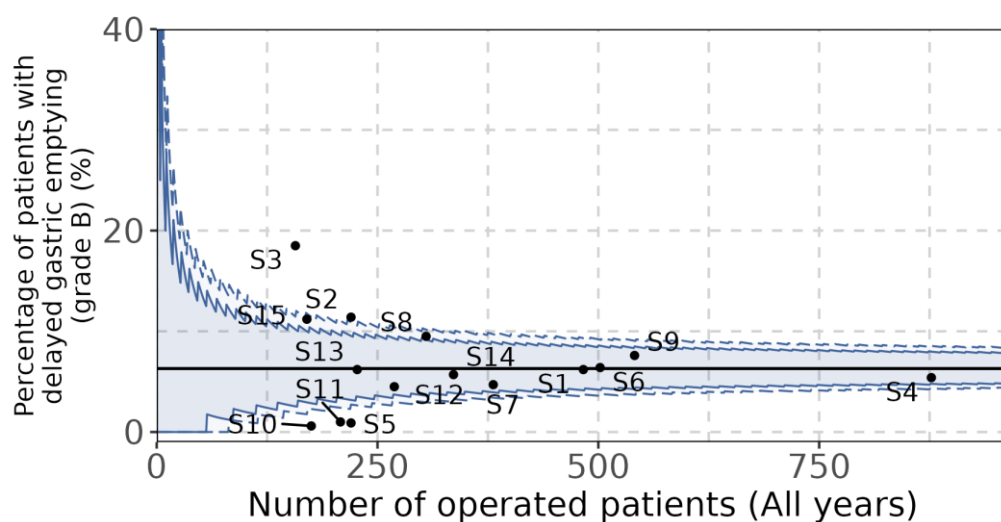
b)



— Belgium — Surgical centers

Figure 34. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **delayed gastric emptying (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

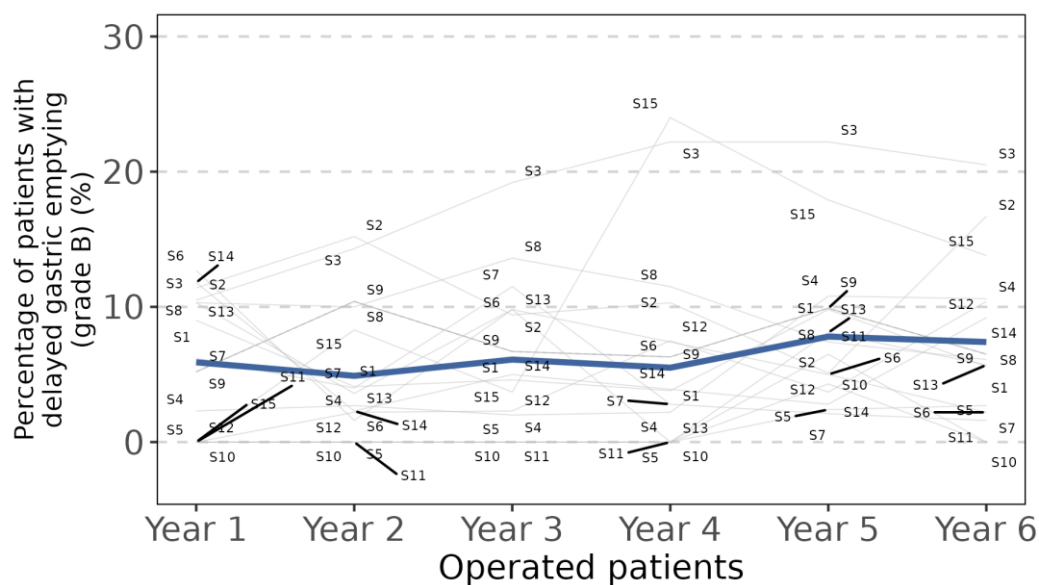
a)



• Surgical center %

— Belgium (6.3%) — 95% - - 99%

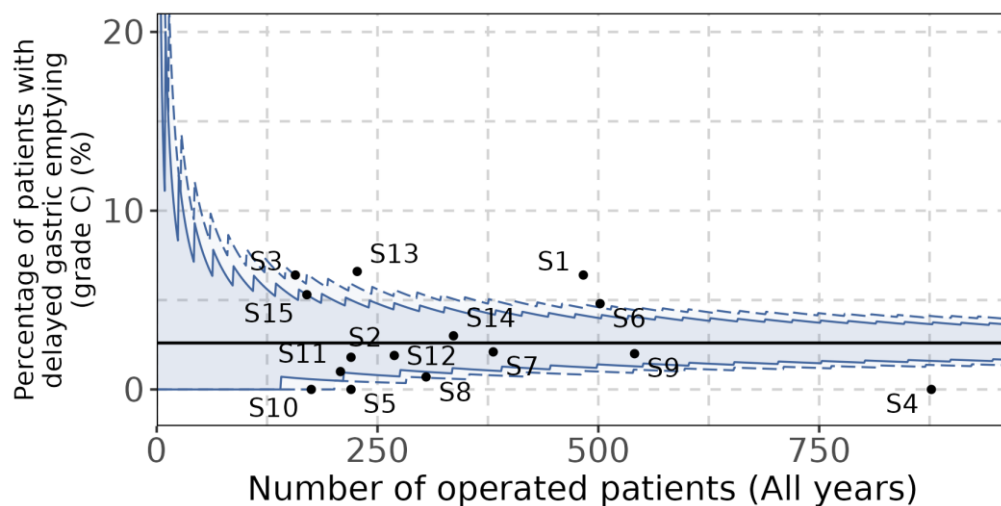
b)



— Belgium — Surgical centers

Figure 35. Funnel and spaghetti plot of operated patients with **malignant and benign tumours** with **delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

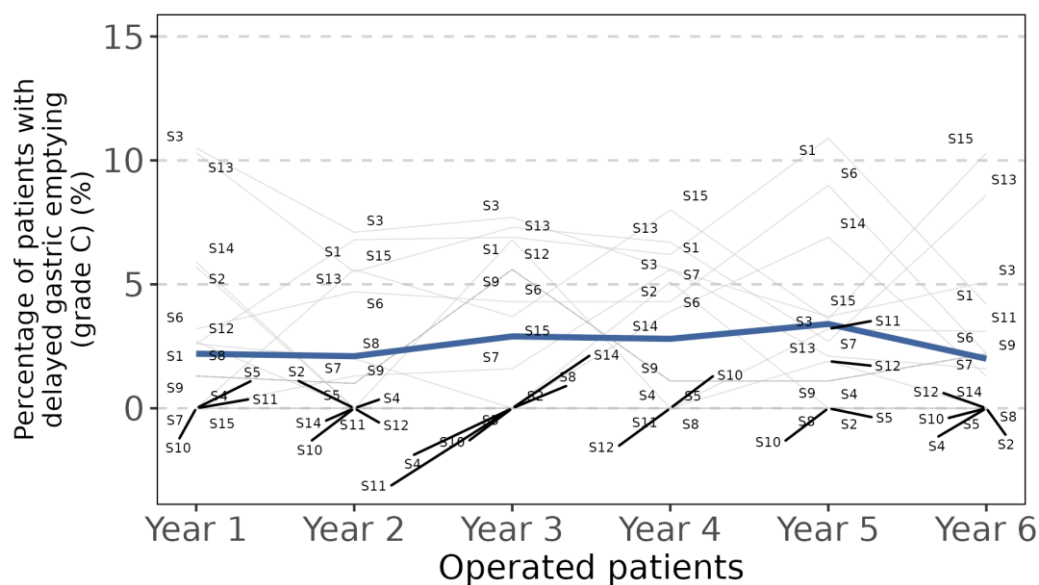
a)



• Surgical center %

— Belgium (2.6%) — 95% -- 99%

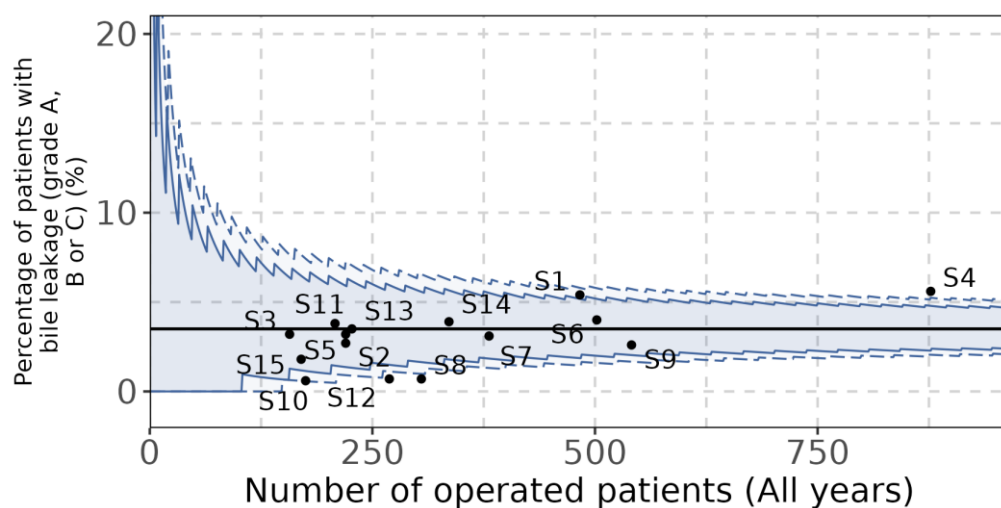
b)



— Belgium — Surgical centers

Figure 36. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



• Surgical center %

— Belgium (3.5%) — 95% -- 99%

b)

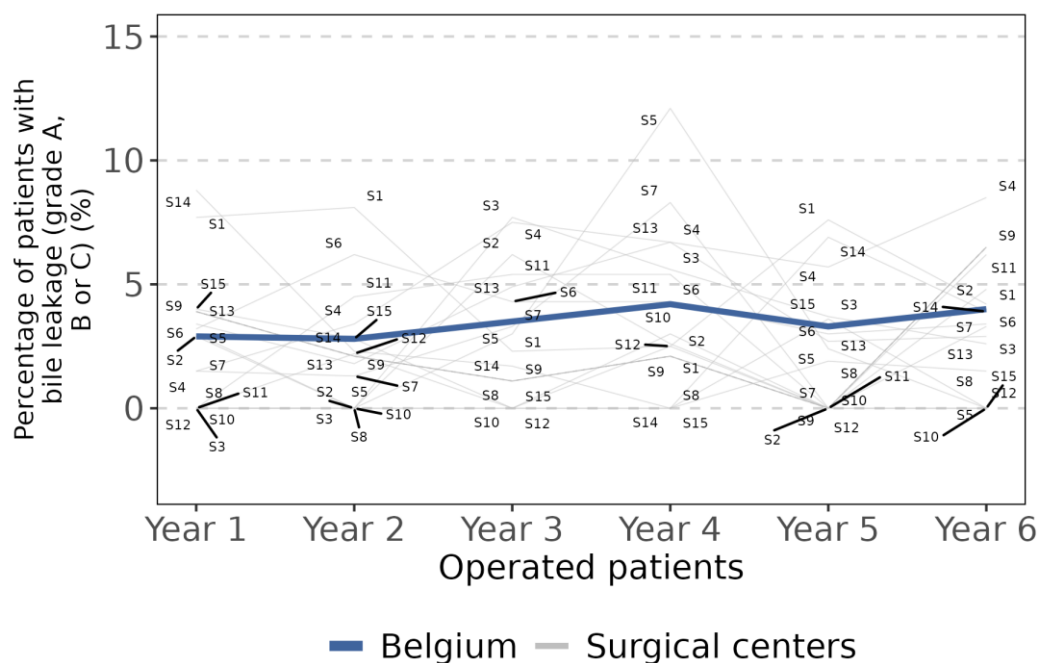
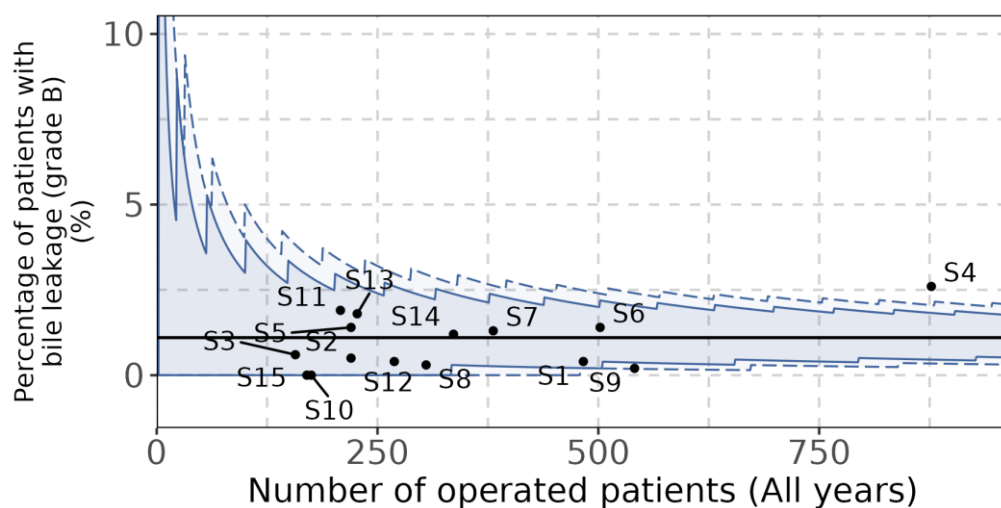


Figure 37. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



• Surgical center %

— Belgium (1.1%) — 95% -- 99%

b)

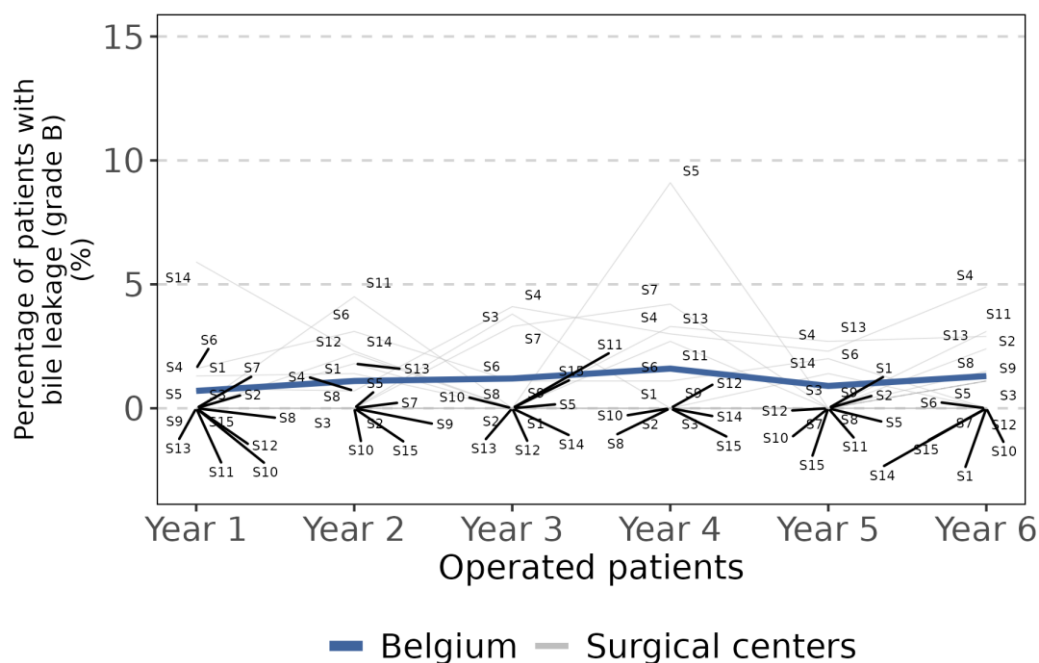
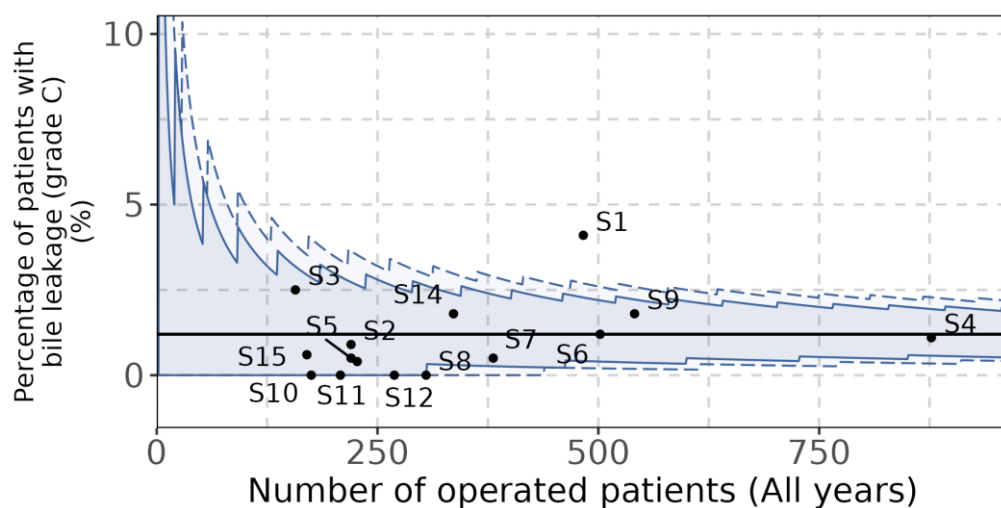


Figure 38. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

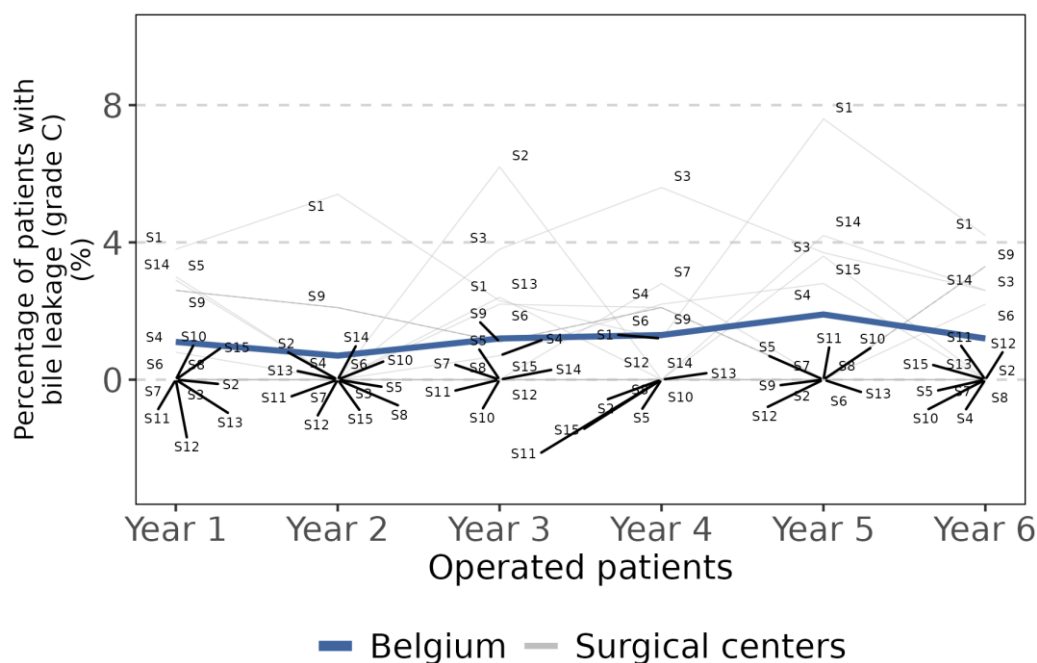
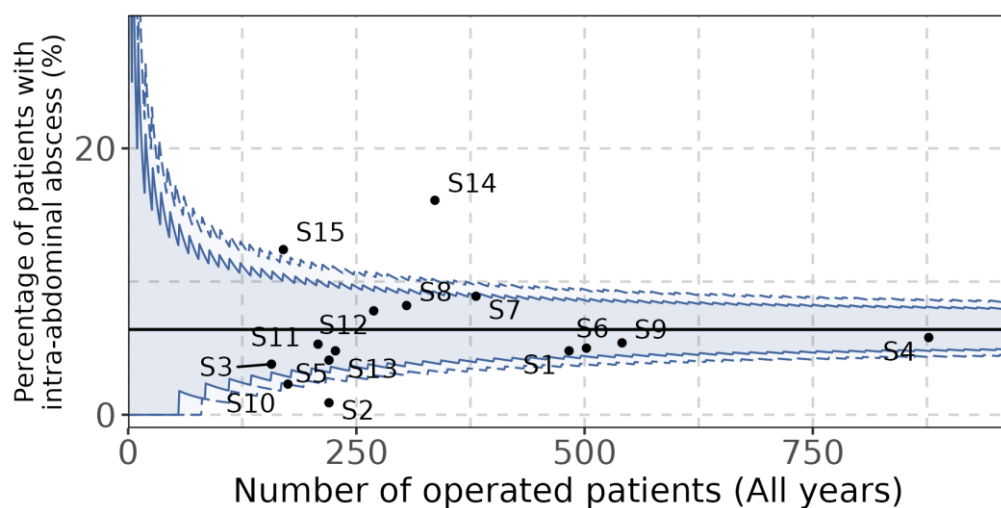


Figure 39. Funnel and spaghetti plot of operated patients with **malignant and benign tumours with intra-abdominal abscess (within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

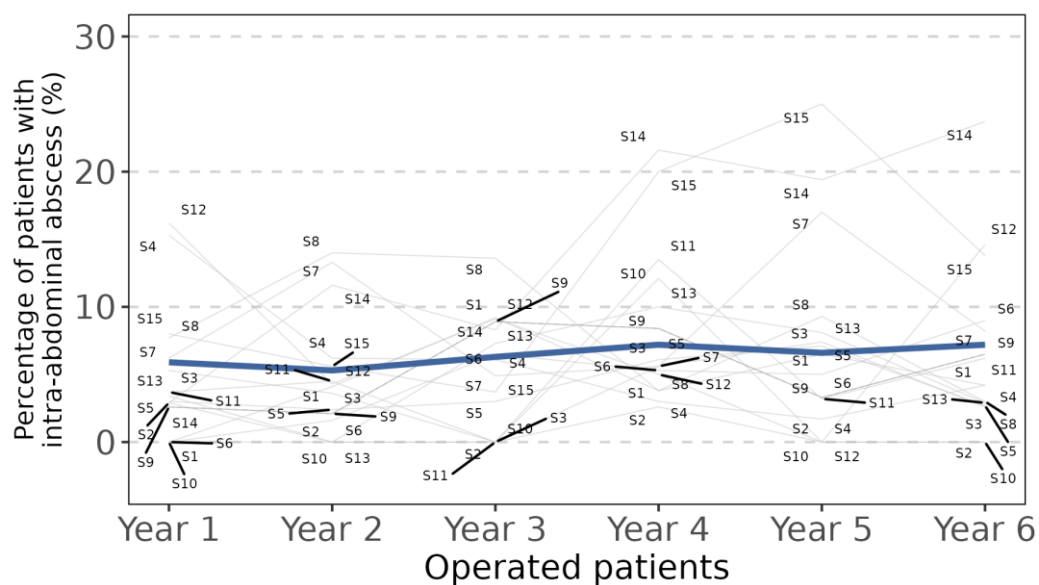
a)



• Surgical center %

— Belgium (6.4%) — 95% -- 99%

b)



— Belgium — Surgical centers

3.3.4.1. Proportion of operated patients with severe surgical complications (Clavien-Dindo grade IIIb-V, 90-day postoperative, in-hospital)

Table 28. Proportion of operated patients with **malignant and benign tumours** in the six convention years with severe surgical complications, by patient and tumour characteristics.

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Operated patients with a malignant/benign tumour	5,071	762	15.0	[14.1, 16.0]
Expert centers				
S1	483	76	15.7	[12.6, 19.3]
S2	220	22	10.0	[6.4, 14.7]
S3	157	15	9.6	[5.4, 15.3]
S4	877	174	19.8	[17.2, 22.6]
S5	220	38	17.3	[12.5, 22.9]
S6	502	98	19.5	[16.1, 23.3]
S7	381	41	10.8	[7.8, 14.3]
S8	305	28	9.2	[6.2, 13.0]
S9	541	81	15.0	[12.1, 18.3]
S10	175	8	4.6	[2.0, 8.8]
S11	208	31	14.9	[10.4, 20.5]
S12	269	34	12.6	[8.9, 17.2]
S13	227	33	14.5	[10.2, 19.8]
S14	336	62	18.5	[14.4, 23.0]
S15	170	21	12.4	[7.8, 18.3]
Convention year				
Year 1	724	98	13.5	[11.1, 16.2]
Year 2	856	114	13.3	[11.1, 15.8]
Year 3	851	125	14.7	[12.4, 17.2]
Year 4	834	112	13.4	[11.2, 15.9]
Year 5	913	160	17.5	[15.1, 20.1]
Year 6	893	153	17.1	[14.7, 19.8]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Sex				
Male	2,707	459	17.0	[15.6, 18.4]
Female	2,364	303	12.8	[11.5, 14.2]
Age at surgery				
<=69	2,835	406	14.3	[13.1, 15.7]
70-79	1,760	283	16.1	[14.4, 17.9]
>=80	476	73	15.3	[12.2, 18.9]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	4,935	739	15.0	[14.0, 16.0]
Relapse of primary tumour	64	11	17.2	[8.9, 28.7]
Metastasis	70	11	15.7	[8.1, 26.4]
Morphology				
Adenocarcinoma	3,271	514	15.7	[14.5, 17.0]
Neuroendocrine tumour	711	94	13.2	[10.8, 15.9]
Benign tumour	672	92	13.7	[11.2, 16.5]
Other or unspecified	417	62	14.9	[11.6, 18.7]
Primary tumour localisation				
C17.0 Duodenum	224	46	20.5	[15.4, 26.4]
C24.0 Extrahepatic bile duct	252	47	18.7	[14.0, 24.0]
C24.1 (Peri-) ampullary region	424	85	20.0	[16.3, 24.2]
C25.0 Head of pancreas	1,908	313	16.4	[14.8, 18.1]
C25.1 Body of pancreas	441	59	13.4	[10.3, 16.9]
C25.2 Tail of pancreas	699	71	10.2	[8.0, 12.6]
C25.3 Pancreatic duct	19	1	5.3	[0.1, 26.0]
C25.4 Islands of Langerhans	35	1	2.9	[0.1, 14.9]
C25.7-9 Other specified parts of pancreas	219	25	11.4	[7.5, 16.4]
Other	137	19	13.9	[8.6, 20.8]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Missing or benign	713	95	13.3	[10.9, 16.0]
Clinical stage				
0	111	18	16.2	[9.9, 24.4]
I	2,139	324	15.1	[13.7, 16.7]
II	1,197	192	16.0	[14.0, 18.2]
III	450	68	15.1	[11.9, 18.8]
IV	113	16	14.2	[8.3, 22.0]
X	282	39	13.8	[10.0, 18.4]
TNM not applicable or relapse *	779	105	13.5	[11.2, 16.1]
Resection margin °				
R0	3,168	483	15.2	[14.0, 16.5]
R1	1,166	182	15.6	[13.6, 17.8]
R2	14	3	21.4	[4.7, 50.8]
Missing	12	0	0.0	[0.0, 26.5]
Prior surgery or endoscopic treatment **				
Prior abdominal surgery	749	119	15.9	[13.3, 18.7]
Other treatment modality (that could affect the pancreas)	689	135	19.6	[16.7, 22.8]
Neoadjuvant treatment				
Chemoradiotherapy	102	15	14.7	[8.5, 23.1]
Chemotherapy	706	91	12.9	[10.5, 15.6]
Radiotherapy	4	0	0.0	[0.0, 60.2]
No chemo or radiation treatment	4,259	656	15.4	[14.3, 16.5]
Charlson Comorbidity Index				
0	2,118	309	14.6	[13.1, 16.2]
1	1,226	174	14.2	[12.3, 16.3]
2	810	117	14.4	[12.1, 17.1]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
3	403	73	18.1	[14.5, 22.2]
4	233	37	15.9	[11.4, 21.2]
5	105	27	25.7	[17.7, 35.2]
6	83	11	13.3	[6.8, 22.5]
7	44	7	15.9	[6.6, 30.1]
8	30	3	10.0	[2.1, 26.5]
9	10	2	20.0	[2.5, 55.6]
10	5	1	20.0	[0.5, 71.6]
11	2	0	0.0	[0.0, 84.2]
12	2	1	50.0	[1.3, 98.7]
WHO score at surgery				
0 - Asymptomatic, normal activity	1,558	229	14.7	[13.0, 16.6]
1 - Symptomatic, but ambulant	2,946	423	14.4	[13.1, 15.7]
2 - Symptomatic, bedbound < 50% day	484	91	18.8	[15.4, 22.6]
3 - Symptomatic, bedbound > 50% day	80	17	21.2	[12.9, 31.8]
4 - Completely dependent, 100% bedbound	3	2	66.7	[9.4, 99.2]
ASA score				
1 - Healthy person	307	33	10.7	[7.5, 14.8]
2 - Mild systemic disease, normal activity	2,636	356	13.5	[12.2, 14.9]
3 - Serious systemic disease, limited activity	2,073	361	17.4	[15.8, 19.1]
4 - Life-threatening illness, handicapped	55	12	21.8	[11.8, 35.0]
Resectability status α				
Before neoadjuvant treatment				
Upfront resectable	175	21	12.0	[7.6, 17.8]
Borderline resectable	417	55	13.2	[10.1, 16.8]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Unresectable	92	11	12.0	[6.1, 20.4]
No neoadjuvant treatment	2,764	448	16.2	[14.9, 17.6]
Before surgery				
Upfront resectable	2,984	463	15.5	[14.2, 16.9]
Borderline resectable	431	69	16.0	[12.7, 19.8]
Unresectable	26	3	11.5	[2.4, 30.2]
Missing	7	0	0.0	[0.0, 41.0]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	1,329	174	13.1	[11.3, 15.0]
Minimally invasive surgery (MIS) - Hybrid	5	2	40.0	[5.3, 85.3]
Minimally invasive surgery (MIS) - Robotic	712	121	17.0	[14.3, 20.0]
Open	2,785	414	14.9	[13.6, 16.2]
Conversion from MIS to open surgery	240	51	21.2	[16.3, 27.0]
Simultaneous venous resection				
No	4,448	654	14.7	[13.7, 15.8]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	623	108	17.3	[14.4, 20.5]
- With primary wedge-reconstruction	206	25	12.1	[8.0, 17.4]
- With primary end-to-end reconstruction	251	44	17.5	[13.0, 22.8]
- With vascular autograft interposition	15	3	20.0	[4.3, 48.1]
- With vascular allograft interposition	78	25	32.1	[21.9, 43.6]
- With synthetic/prosthetic interposition	12	3	25.0	[5.5, 57.2]
- With peritoneal patch wedge-reconstruction	50	7	14.0	[5.8, 26.7]
- Without reconstruction	11	1	9.1	[0.2, 41.3]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
<i>Simultaneous arterial resection **</i>				
No	4,991	752	15.1	[14.1, 16.1]
Hepatic artery resection	33	3	9.1	[1.9, 24.3]
- With primary end-to-end reconstruction	20	2	10.0	[1.2, 31.7]
- With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
- Without reconstruction	11	1	9.1	[0.2, 41.3]
Coeliac trunk resection	37	5	13.5	[4.5, 28.8]
- With primary end-to-end reconstruction	2	0	0.0	[0.0, 84.2]
- Without reconstruction	34	5	14.7	[5.0, 31.1]
Superior mesenteric artery (SMA) resection	9	2	22.2	[2.8, 60.0]
- With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
- With primary end-to-end reconstruction	3	1	33.3	[0.8, 90.6]
- With vascular autograft interposition	2	1	50.0	[1.3, 98.7]
- Without reconstruction	3	0	0.0	[0.0, 70.8]
<i>Simultaneous other organ resection **</i>				
No	3,097	499	16.1	[14.8, 17.5]
Colon	125	33	26.4	[18.9, 35.0]
Stomach	698	110	15.8	[13.1, 18.7]
Adrenal gland	101	9	8.9	[4.2, 16.2]
Spleen	1,161	131	11.3	[9.5, 13.2]
Other	304	46	15.1	[11.3, 19.7]
<i>RIZIV code for complex surgery</i>				
242830-242841: Pancreaticoduodenectomy	3,337	575	17.2	[16.0, 18.6]
Pancreaticoduodenectomy	3,012	513	17.0	[15.7, 18.4]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Total Pancreatectomy	324	62	19.1	[15.0, 23.8]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	456	48	10.5	[7.9, 13.7]
242874-242885: Hemipancreatectomy left	1,202	132	11.0	[9.3, 12.9]
242896-242900: Enucleation of a pancreatic tumour	76	7	9.2	[3.8, 18.1]
Antithrombotic medication				
No	3,578	503	14.1	[12.9, 15.2]
Yes	1,493	259	17.3	[15.5, 19.4]
Was the patient referred?				
No	2,328	355	15.2	[13.8, 16.8]
Yes	2,743	407	14.8	[13.5, 16.2]

*: Tumour staging not possible.

**: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

α: Results for this variable are only for malignant tumours and resectability status results are only available from the second half of Y2 onwards. .

°: Results for this variable are only for malignant tumours

4. Non-tumoural pathology

4.1. Descriptive

4.1.1 Patient case-mix description

Table 29. Case mix description of all patients with **non-tumoural pathology** discussed on a MC expert (with and without surgery).

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Patients discussed on a MC expert	221		251		321		313		332		327	
Expert centers												
S1	10	4.5	15	6.0	19	5.9	17	5.4	14	4.2	10	3.1
S2	24	10.9	25	10.0	42	13.1	49	15.7	51	15.4	53	16.2
S3	13	5.9	25	10.0	20	6.2	17	5.4	16	4.8	10	3.1
S4	10	4.5	26	10.4	39	12.1	42	13.4	40	12.0	40	12.2
S5	4	1.8	4	1.6	1	0.3	1	0.3	3	0.9	3	0.9
S6	13	5.9	9	3.6	10	3.1	7	2.2	2	0.6	9	2.8
S7	7	3.2	10	4.0	14	4.4	25	8.0	24	7.2	23	7.0
S8	14	6.3	24	9.6	40	12.5	30	9.6	35	10.5	31	9.5
S9	42	19.0	25	10.0	43	13.4	24	7.7	49	14.8	33	10.1
S10	35	15.8	22	8.8	19	5.9	22	7.0	33	9.9	28	8.6
S11	9	4.1	4	1.6	1	0.3	4	1.3	0	0.0	1	0.3
S12	8	3.6	19	7.6	28	8.7	18	5.8	24	7.2	31	9.5
S13	10	4.5	18	7.2	16	5.0	27	8.6	11	3.3	21	6.4
S14	17	7.7	24	9.6	28	8.7	29	9.3	25	7.5	31	9.5
S15	5	2.3	1	0.4	1	0.3	1	0.3	5	1.5	3	0.9
Sex												
Female	71	32.1	84	33.5	123	38.3	118	37.7	127	38.3	137	41.9
Male	150	67.9	167	66.5	198	61.7	195	62.3	205	61.7	190	58.1
Age at surgery												

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
<=69	165	74.7	183	72.9	221	68.8	212	67.7	248	74.7	230	70.3
70-79	38	17.2	51	20.3	71	22.1	76	24.3	59	17.8	74	22.6
>=80	18	8.1	17	6.8	29	9.0	25	8.0	25	7.5	23	7.0
Missing	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Indication												
Pancreatitis	109	49.3	149	59.4	156	48.6	156	49.8	153	46.1	161	49.2
Other	112	50.7	102	40.6	165	51.4	157	50.2	179	53.9	166	50.8
Was the patient referred?												
No	151	68.3	172	68.5	219	68.2	223	71.2	207	62.3	206	63.0
Yes	70	31.7	78	31.1	102	31.8	90	28.8	125	37.7	121	37.0
Missing	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0

Table 30. Case mix description of all patients with **non-tumoural pathology** discussed on a MC expert discussed on a MC expert who underwent surgical treatment.

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Patient with surgery	63		72		69		85		100		85	
Expert centers												
S1	7	11.1	9	12.5	11	15.9	10	11.8	11	11.0	9	10.6
S2	1	1.6	3	4.2	1	1.4	2	2.4	2	2.0	4	4.7
S3	2	3.2	0	0.0	1	1.4	2	2.4	2	2.0	4	4.7
S4	4	6.3	8	11.1	14	20.3	19	22.4	16	16.0	11	12.9
S5	4	6.3	4	5.6	1	1.4	1	1.2	2	2.0	3	3.5
S6	2	3.2	5	6.9	3	4.3	6	7.1	1	1.0	5	5.9
S7	5	7.9	5	6.9	3	4.3	7	8.2	7	7.0	9	10.6
S8	6	9.5	6	8.3	3	4.3	6	7.1	4	4.0	5	5.9
S9	10	15.9	10	13.9	17	24.6	16	18.8	24	24.0	6	7.1
S10	3	4.8	3	4.2	3	4.3	3	3.5	11	11.0	5	5.9
S11	3	4.8	1	1.4	0	0.0	3	3.5	0	0.0	1	1.2
S12	7	11.1	6	8.3	7	10.1	5	5.9	12	12.0	5	5.9
S13	1	1.6	3	4.2	0	0.0	1	1.2	1	1.0	3	3.5
S14	5	7.9	8	11.1	4	5.8	3	3.5	3	3.0	12	14.1
S15	3	4.8	1	1.4	1	1.4	1	1.2	4	4.0	3	3.5
Sex												
Female	21	33.3	22	30.6	22	31.9	28	32.9	29	29.0	30	35.3
Male	42	66.7	50	69.4	47	68.1	57	67.1	71	71.0	55	64.7
Age at surgery												
<=69	56	88.9	63	87.5	62	89.9	76	89.4	82	82.0	68	80.0
70-79	7	11.1	9	12.5	6	8.7	6	7.1	14	14.0	16	18.8
>=80	0	0.0	0	0.0	1	1.4	3	3.5	4	4.0	1	1.2
Indication												
Pancreatitis	36	57.1	51	70.8	44	63.8	56	65.9	63	63.0	56	65.9

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Other	27	42.9	21	29.2	25	36.2	29	34.1	37	37.0	29	34.1
Prior surgery or other treatment												
**												
Prior abdominal surgery	10	15.9	15	20.8	19	27.5	15	17.6	21	21.0	17	20.0
Other treatment modality (that could affect the pancreas)	11	17.5	18	25.0	14	20.3	16	18.8	19	19.0	16	18.8
Charlson Comorbidity Index												
0	22	34.9	30	41.7	31	44.9	40	47.1	39	39.0	42	49.4
1	18	28.6	17	23.6	13	18.8	19	22.4	30	30.0	16	18.8
2	13	20.6	9	12.5	8	11.6	14	16.5	18	18.0	15	17.6
3	4	6.3	8	11.1	9	13.0	7	8.2	8	8.0	5	5.9
4	3	4.8	5	6.9	4	5.8	4	4.7	2	2.0	2	2.4
5	0	0.0	1	1.4	2	2.9	0	0.0	3	3.0	2	2.4
6	3	4.8	1	1.4	0	0.0	0	0.0	0	0.0	0	0.0
7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
8	0	0.0	0	0.0	0	0.0	1	1.2	0	0.0	2	2.4
9	0	0.0	0	0.0	1	1.4	0	0.0	0	0.0	1	1.2
11	0	0.0	1	1.4	0	0.0	0	0.0	0	0.0	0	0.0
WHO score at surgery												
0 - Asymptomatic, normal activity	11	17.5	15	20.8	21	30.4	17	20.0	38	38.0	26	30.6
1 - Symptomatic, but ambulant	39	61.9	49	68.1	38	55.1	61	71.8	51	51.0	46	54.1
2 - Symptomatic	9	14.3	7	9.7	8	11.6	5	5.9	8	8.0	11	12.9

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
c, bedbound < 50% day												
3 - Symptomatic, bedbound > 50% day	3	4.8	1	1.4	1	1.4	1	1.2	1	1.0	2	2.4
4 - Completely dependent, 100% bedbound	1	1.6	0	0.0	1	1.4	1	1.2	2	2.0	0	0.0
ASA score												
1 - Healthy person	5	7.9	3	4.2	4	5.8	3	3.5	7	7.0	6	7.1
2 - Mild systemic disease, normal activity	34	54.0	40	55.6	34	49.3	44	51.8	53	53.0	42	49.4
3 - Serious systemic disease, limited activity	21	33.3	28	38.9	30	43.5	36	42.4	39	39.0	37	43.5
4 - Life-threatening illness, handicapped	3	4.8	1	1.4	1	1.4	1	1.2	1	1.0	0	0.0
Type of surgery												
Conversion from MIS to open surgery	0	0.0	4	5.6	5	7.2	10	11.8	4	4.0	3	3.5
Minimally invasive surgery (MIS) - Hybrid	0	0.0	1	1.4	1	1.4	0	0.0	0	0.0	0	0.0
Minimally invasive surgery (MIS) - Laparoscopic	15	23.8	13	18.1	18	26.1	14	16.5	16	16.0	13	15.3
Minimally invasive surgery	3	4.8	8	11.1	5	7.2	12	14.1	19	19.0	25	29.4

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
(MIS) - Robotic												
Open	45	71.4	46	63.9	40	58.0	49	57.6	61	61.0	44	51.8
Simultaneous vascular resection												
No vascular reconstruction	60	95.2	69	95.8	69	100.0	80	94.1	92	92.0	81	95.3
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	3	4.8	3	4.2	0	0.0	4	4.7	6	6.0	4	4.7
Simultaneous arterial resection**	0	0.0	0	0.0	0	0.0	0	0.0	2	2.0	0	0.0
Missing	0	0.0	0	0.0	0	0.0	1	1.2	0	0.0	0	0.0
Simultaneous other organ resection**												
No	42	66.7	42	58.3	40	58.0	57	67.1	67	67.0	47	55.3
Colon	1	1.6	4	5.6	3	4.3	3	3.5	4	4.0	2	2.4
Stomach	6	9.5	9	12.5	8	11.6	8	9.4	13	13.0	7	8.2
Adrenal gland	1	1.6	2	2.8	3	4.3	1	1.2	1	1.0	1	1.2
Spleen	14	22.2	19	26.4	19	27.5	17	20.0	22	22.0	29	34.1
Other	6	9.5	5	6.9	6	8.7	4	4.7	7	7.0	3	3.5
RIZIV code for complex surgery												
242830-242841: Pancreaticoduodenectomy	37	58.7	40	55.6	38	55.1	46	54.1	55	55.0	49	57.6
Pancreaticoduodenectomy	34	91.9	35	87.5	35	92.1	40	87.0	48	87.3	40	81.6
Total Pancreatectomy	3	8.1	5	12.5	3	7.9	6	13.0	7	12.7	9	18.4

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
242852- 242863: Hemipancr atectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatect omy (95 pct)	5	7.9	13	18.1	12	17.4	17	20.0	20	20.0	8	9.4
242874- 242885: Hemipancr atectomy left	21	33.3	19	26.4	18	26.1	21	24.7	22	22.0	27	31.8
242896- 242900: Enucleation of a pancreatic tumour	0	0.0	0	0.0	1	1.4	1	1.2	3	3.0	1	1.2
Antithrombotic medication												
No	50	79.4	57	79.2	53	76.8	63	74.1	78	78.0	63	74.1
Yes	13	20.6	15	20.8	16	23.2	22	25.9	22	22.0	22	25.9
Was the patient referred?												
No	39	61.9	41	56.9	43	62.3	56	65.9	63	63.0	46	54.1
Yes	24	38.1	31	43.1	26	37.7	29	34.1	37	37.0	39	45.9

**: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

4.1.2. Completeness of registration

The indicator 'completeness of registration forms' indicates for how many patients a fully completed dataset was received (including all requested complex surgery variables and textual reports).

Minimum target value: $\geq 95\%$ for the sixth convention year.

Table 31. Completeness of registration forms: number of registrations in complex surgery database that were complete in the sixth convention year.

Belgium			
Patient group	N registered	n complete	n/N (%)
<i>Patients discussed on a MC in Year 6</i>	327	327	100
<i>Surgery status</i>			
<i>Patients with surgery in Year 6</i>	85	85	100
Patients without surgery in Year 6	242	242	100
<i>Expert centers</i>			
S1	10	10	100
S2	53	53	100
S3	10	10	100
S4	40	40	100
S5	3	3	100
S6	9	9	100
S7	23	23	100
S8	31	31	100
S9	33	33	100
S10	28	28	100
S11	1	1	100
S12	31	31	100
S13	21	21	100
S14	31	31	100
S15	3	3	100

4.2. Process indicators

4.2.1 Length of stay in the expert centre

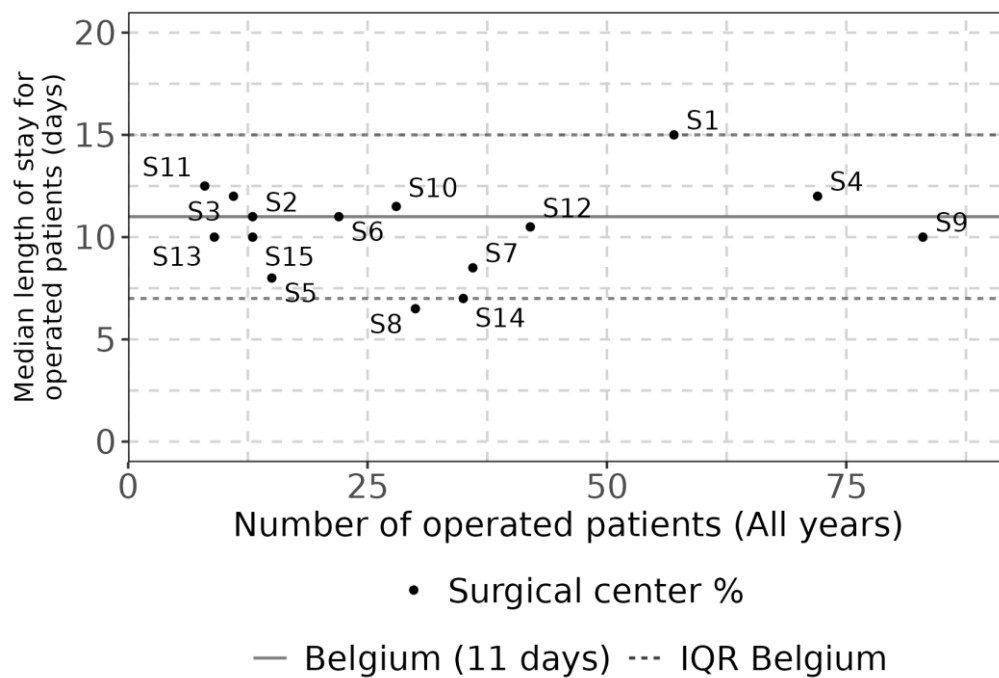
Table 32. Length of stay in an expert centre for operated patients in the sixth convention years.

Belgium			
Characteristic	N	Median (days)	IQR**
Operated patients with non-tumoural pathology*	474	11	[7, 15]
Convention year			
Year 1	63	12	[9, 15]
Year 2	72	12	[7, 16]
Year 3	69	10	[7, 14]
Year 4	85	10	[8, 15]
Year 5	100	12	[8, 16]
Year 6	85	10	[7, 14]

*:length of stay longer than 90 days was truncated at 90 days.

**.: Interquartile Range= [the 25th, and 75th percentiles of the data]

Figure 40. Median length of stay for operated patients, per centre, for all years combined.



4.3. Outcome indicators

4.3.1 Postoperative mortality

4.3.1.1. Unadjusted 30-day postoperative mortality

There were only 4 postoperative deaths observed for all hospitals combined (N=1 for Y1, N=1 for Y2, N=0 for Y3, N=1 for Y4, N=1 for Y5 and N=0 for Y6), therefore no results are given.

4.3.1.2. Unadjusted 90-day postoperative mortality

There were only 11 postoperative deaths observed for all hospitals combined (N=3 for Y1, N=2 for Y2, N=0 for Y3, N=2 for Y4, N=2 for Y5 and N=2 for Y6), therefore no results are given.

4.3.2. Survival

4.3.2.1. Unadjusted 1-year observed survival after surgery (all causes of death)

There were only 29 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2, N=5 for Y3, N=3 for Y4, N=8 for Y5 and N=5 for Y6), therefore no results are given.

4.3.2.2. Unadjusted 1-year relative survival after surgery

There were only 29 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2, N=5 for Y3, N=3 for Y4, N=8 for Y5 and N=5 for Y6), therefore no results are given.

4.3.3. Proportion of operated patients with surgical complications

Note that in-hospital is defined as the days the patient was hospitalised between the date of surgery and 90 days post-surgery.

Table 33. Proportion of operated patients with surgical complications in the six convention years (90-day postoperative, in-hospital), by complication type.

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Severe postoperative complications (CD IIIB-V)	474	63	13.3	[10.4, 16.7]
Year 1	63	9	14.3	[6.7, 25.4]
Year 2	72	7	9.7	[4.0, 19.0]
Year 3	69	7	10.1	[4.2, 19.8]
Year 4	85	13	15.3	[8.4, 24.7]
Year 5	100	14	14.0	[7.9, 22.4]
Year 6	85	13	15.3	[8.4, 24.7]
Clinically relevant pancreatic fistula (Grade B or C) 1*	474	79	16.7	[13.4, 20.3]
Grade B	474	71	15.0	[11.9, 18.5]
Year 1	63	4	6.3	[1.8, 15.5]
Year 2	72	11	15.3	[7.9, 25.7]
Year 3	69	8	11.6	[5.1, 21.6]
Year 4	85	15	17.6	[10.2, 27.4]
Year 5	100	20	20.0	[12.7, 29.2]
Year 6	85	13	15.3	[8.4, 24.7]
Grade C	474	8	1.7	[0.7, 3.3]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	2	2.8	[0.3, 9.7]
Year 3	69	1	1.4	[0.0, 7.8]
Year 4	85	4	4.7	[1.3, 11.6]
Year 5	100	0	0.0	[0.0, 3.6]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 6	85	1	1.2	[0.0, 6.4]
Haemorrhage (Grade A, B or C) 2*	474	27	5.7	[3.8, 8.2]
Grade A	474	4	0.8	[0.2, 2.1]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	1	1.4	[0.0, 7.5]
Year 3	69	0	0.0	[0.0, 5.2]
Year 4	85	1	1.2	[0.0, 6.4]
Year 5	100	0	0.0	[0.0, 3.6]
Year 6	85	2	2.4	[0.3, 8.2]
Grade B	474	15	3.2	[1.8, 5.2]
Year 1	63	2	3.2	[0.4, 11.0]
Year 2	72	3	4.2	[0.9, 11.7]
Year 3	69	1	1.4	[0.0, 7.8]
Year 4	85	2	2.4	[0.3, 8.2]
Year 5	100	6	6.0	[2.2, 12.6]
Year 6	85	1	1.2	[0.0, 6.4]
Grade C	474	8	1.7	[0.7, 3.3]
Year 1	63	1	1.6	[0.0, 8.5]
Year 2	72	0	0.0	[0.0, 5.0]
Year 3	69	0	0.0	[0.0, 5.2]
Year 4	85	2	2.4	[0.3, 8.2]
Year 5	100	1	1.0	[0.0, 5.4]
Year 6	85	4	4.7	[1.3, 11.6]
Delayed gastric emptying (Grade A, B or C) 3*	474	63	13.3	[10.4, 16.7]
Grade A	474	37	7.8	[5.6, 10.6]
Year 1	63	2	3.2	[0.4, 11.0]
Year 2	72	8	11.1	[4.9, 20.7]
Year 3	69	1	1.4	[0.0, 7.8]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 4	85	6	7.1	[2.6, 14.7]
Year 5	100	7	7.0	[2.9, 13.9]
Year 6	85	13	15.3	[8.4, 24.7]
Grade B	474	19	4.0	[2.4, 6.2]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	2	2.8	[0.3, 9.7]
Year 3	69	6	8.7	[3.3, 18.0]
Year 4	85	2	2.4	[0.3, 8.2]
Year 5	100	4	4.0	[1.1, 9.9]
Year 6	85	5	5.9	[1.9, 13.2]
Grade C	474	7	1.5	[0.6, 3.0]
Year 1	63	1	1.6	[0.0, 8.5]
Year 2	72	1	1.4	[0.0, 7.5]
Year 3	69	1	1.4	[0.0, 7.8]
Year 4	85	3	3.5	[0.7, 10.0]
Year 5	100	1	1.0	[0.0, 5.4]
Year 6	85	0	0.0	[0.0, 4.2]
Bile leakage (Grade A, B or C) 4*	474	7	1.5	[0.6, 3.0]
Grade A	474	3	0.6	[0.1, 1.8]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	0	0.0	[0.0, 5.0]
Year 3	69	0	0.0	[0.0, 5.2]
Year 4	85	2	2.4	[0.3, 8.2]
Year 5	100	0	0.0	[0.0, 3.6]
Year 6	85	1	1.2	[0.0, 6.4]
Grade B	474	2	0.4	[0.1, 1.5]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	1	1.4	[0.0, 7.5]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 3	69	0	0.0	[0.0, 5.2]
Year 4	85	0	0.0	[0.0, 4.2]
Year 5	100	1	1.0	[0.0, 5.4]
Year 6	85	0	0.0	[0.0, 4.2]
Grade C	474	2	0.4	[0.1, 1.5]
Year 1	63	1	1.6	[0.0, 8.5]
Year 2	72	0	0.0	[0.0, 5.0]
Year 3	69	0	0.0	[0.0, 5.2]
Year 4	85	1	1.2	[0.0, 6.4]
Year 5	100	0	0.0	[0.0, 3.6]
Year 6	85	0	0.0	[0.0, 4.2]
<i>Intra-abdominal abscess *</i>	474	34	7.2	[5.0, 9.9]
Year 1	63	3	4.8	[1.0, 13.3]
Year 2	72	6	8.3	[3.1, 17.3]
Year 3	69	6	8.7	[3.3, 18.0]
Year 4	85	9	10.6	[5.0, 19.2]
Year 5	100	5	5.0	[1.6, 11.3]
Year 6	85	5	5.9	[1.9, 13.2]
<i>Transferred to another hospital due to complications (CD I-IVb)</i>	474	1	0.2	[0.0, 1.2]
Year 1	63	0	0.0	[0.0, 5.7]
Year 2	72	0	0.0	[0.0, 5.0]
Year 3	69	1	1.4	[0.0, 7.8]
Year 4	85	0	0.0	[0.0, 4.2]
Year 5	100	0	0.0	[0.0, 3.6]
Year 6	85	0	0.0	[0.0, 4.2]

CD: Clavien-Dindo grade

1: graded according to the 2016 update of the International Study Group of Pancreatic Surgery (ISGPS)

2: graded according to the ISGPS definitions

3: graded according to the ISGPS definitions

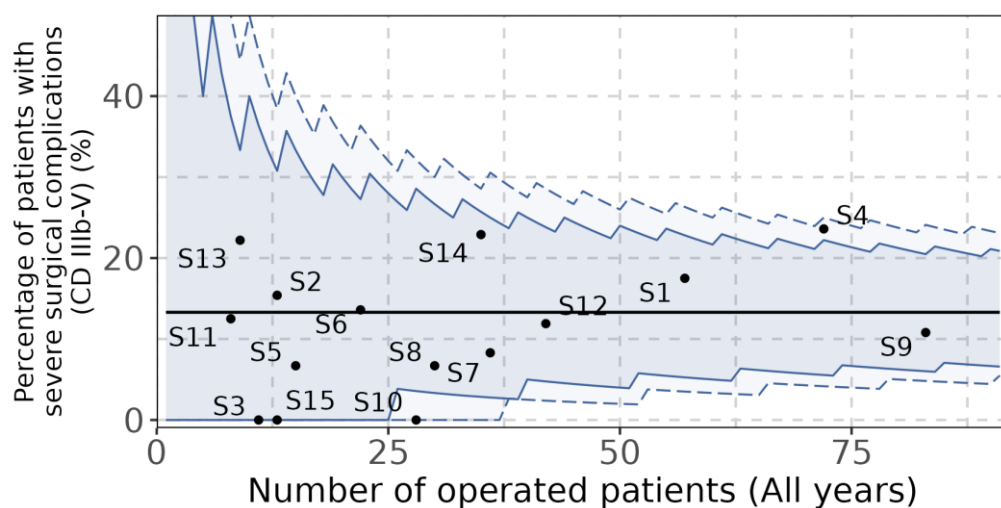
4: graded according to the International Study Group of Liver Surgery (ISGLS)

More information can be found in the project manual.

**: Patients could have a combination of complications, thus the total number of complications could be larger than the total number of patients.*

Figure 41. Funnel and spaghetti plot of operated patients with **severe surgical complications (CDIIlb-V)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

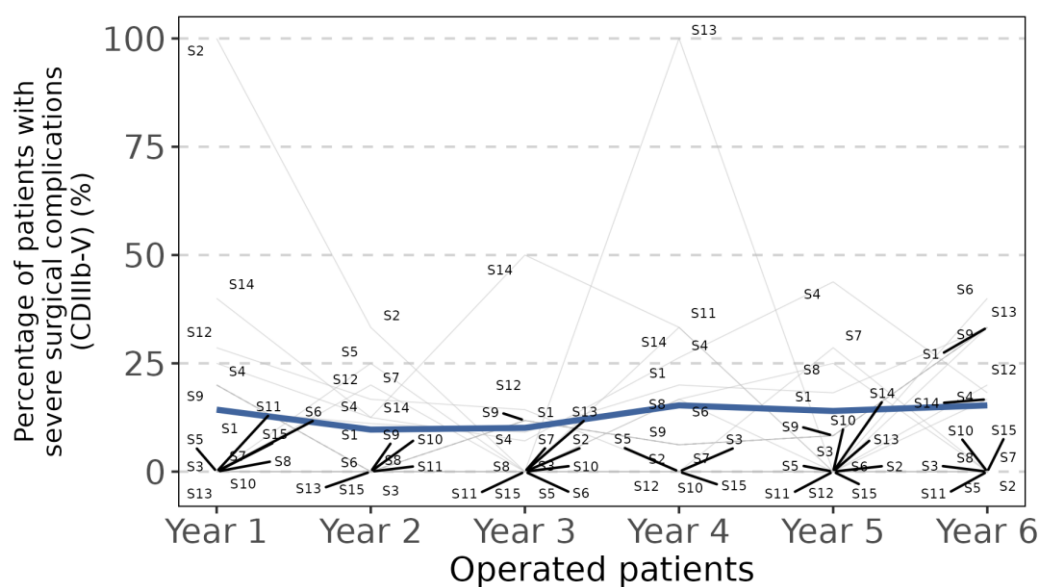
a)



• Surgical center %

— Belgium (13.3%) — 95% -- 99%

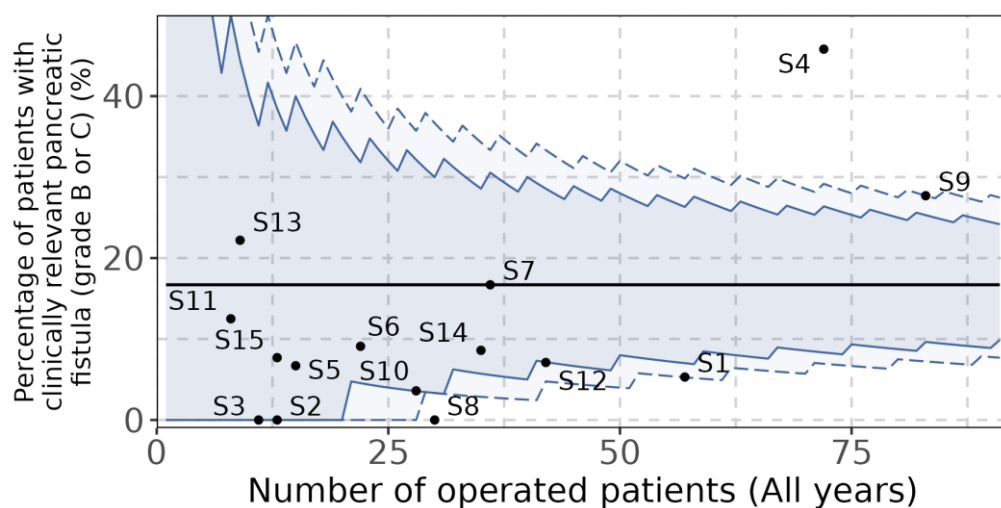
b)



— Belgium — Surgical centers

Figure 42. Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

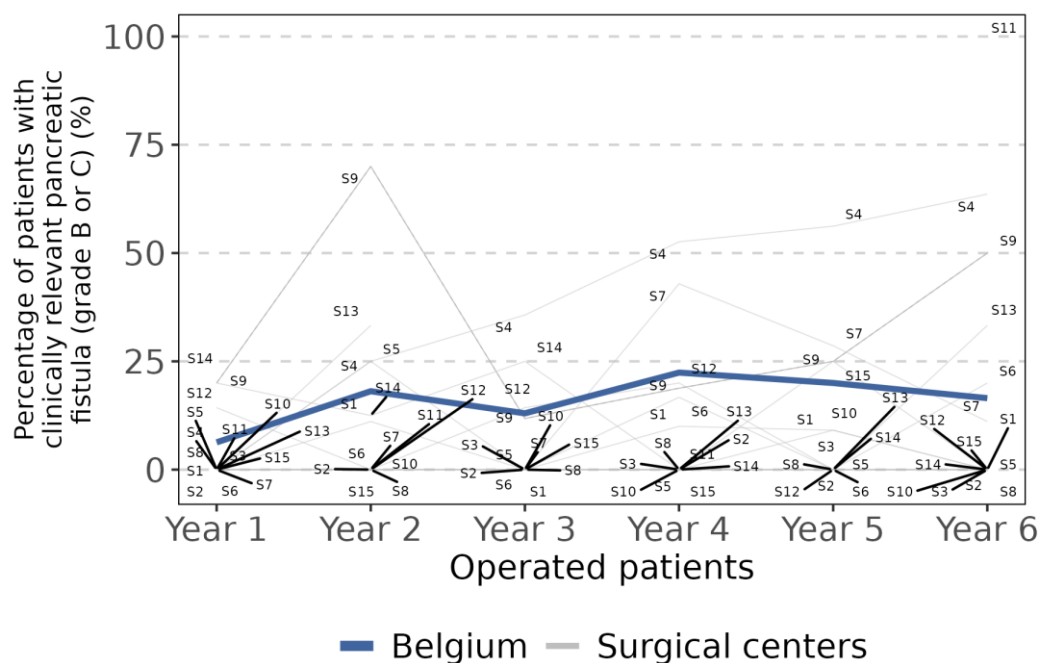
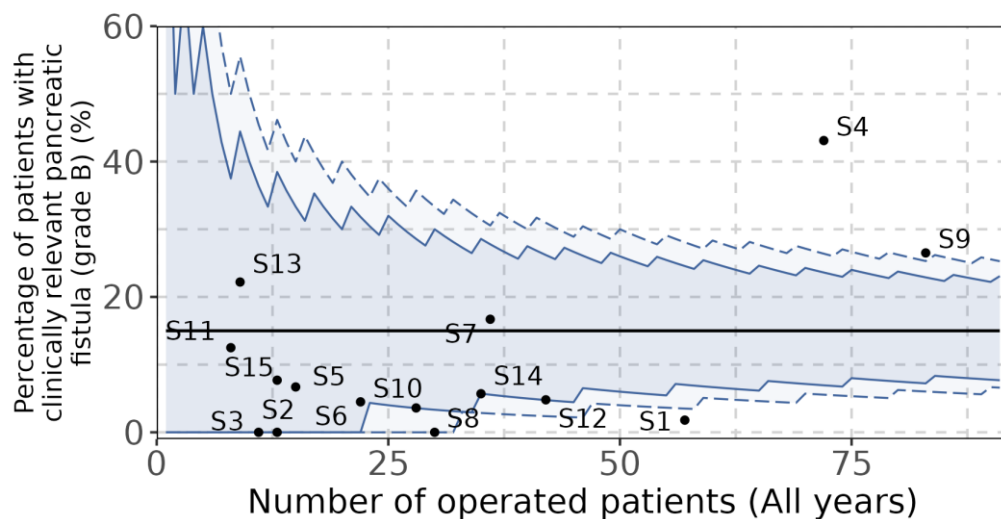


Figure 43. Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

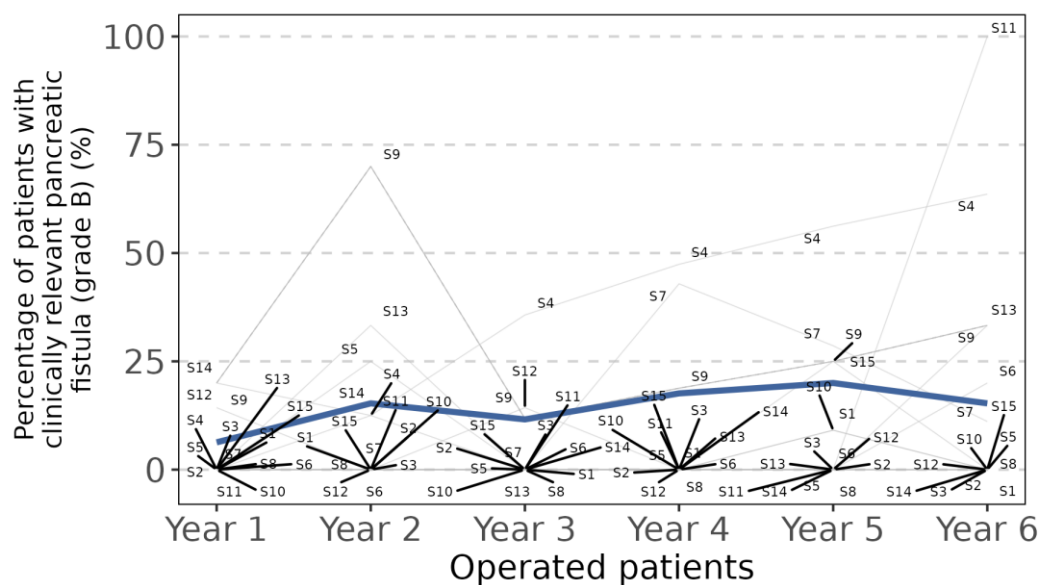
a)



• Surgical center %

— Belgium (15.0%) — 95% -- 99%

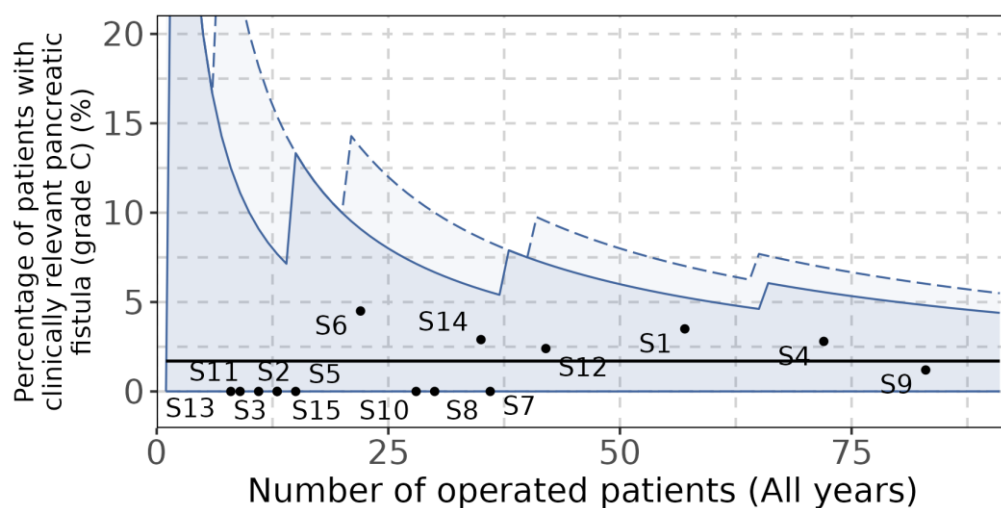
b)



— Belgium — Surgical centers

Figure 44. Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

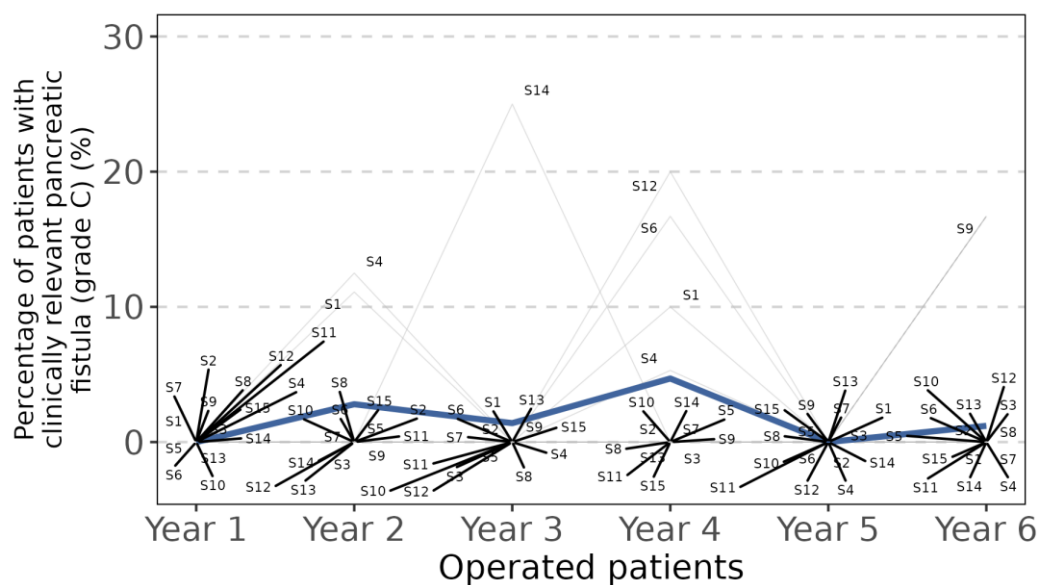
a)



• Surgical center %

— Belgium (1.7%) — 95% -- 99%

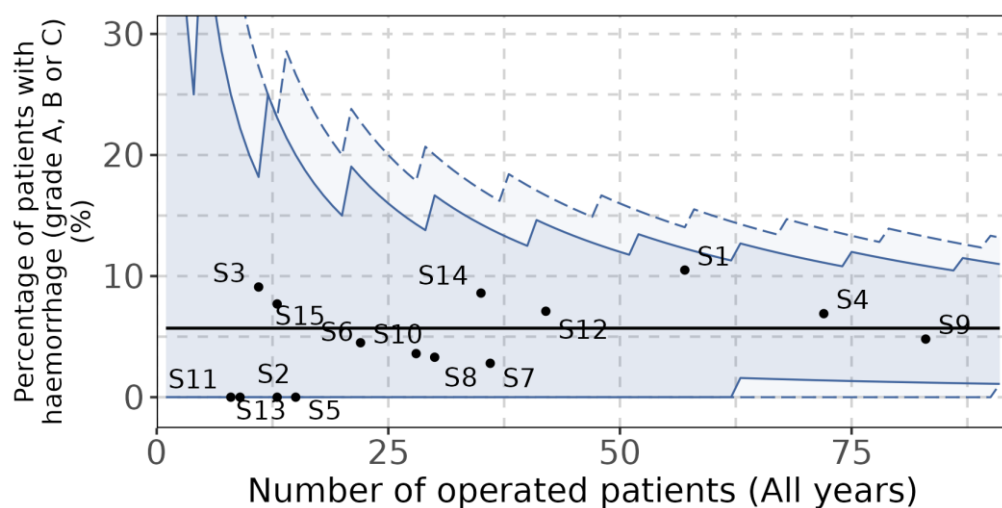
b)



— Belgium — Surgical centers

Figure 45. Funnel and spaghetti plot of operated patients with **haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

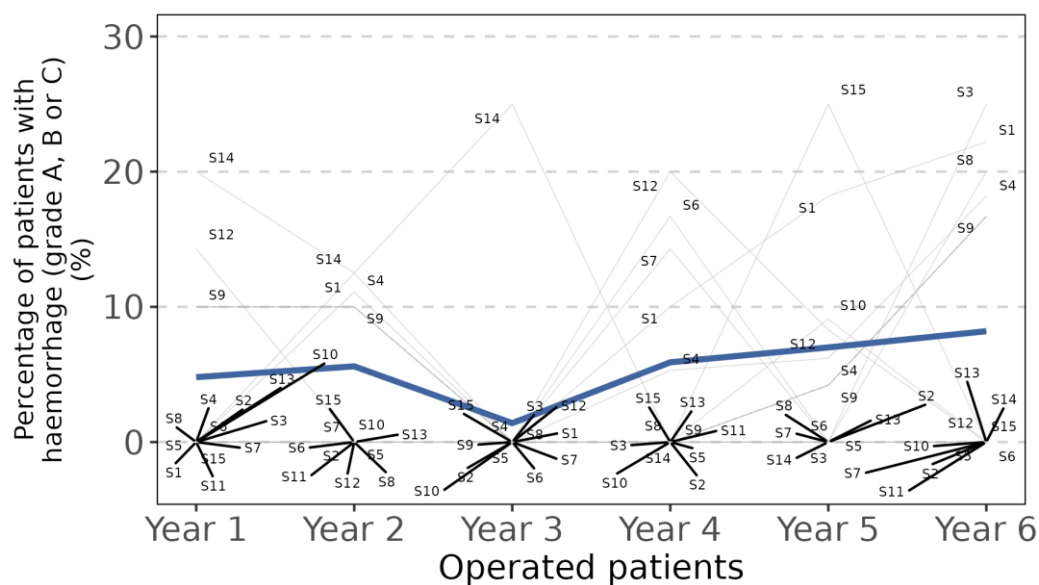
a)



• Surgical center %

— Belgium (5.7%) — 95% - - 99%

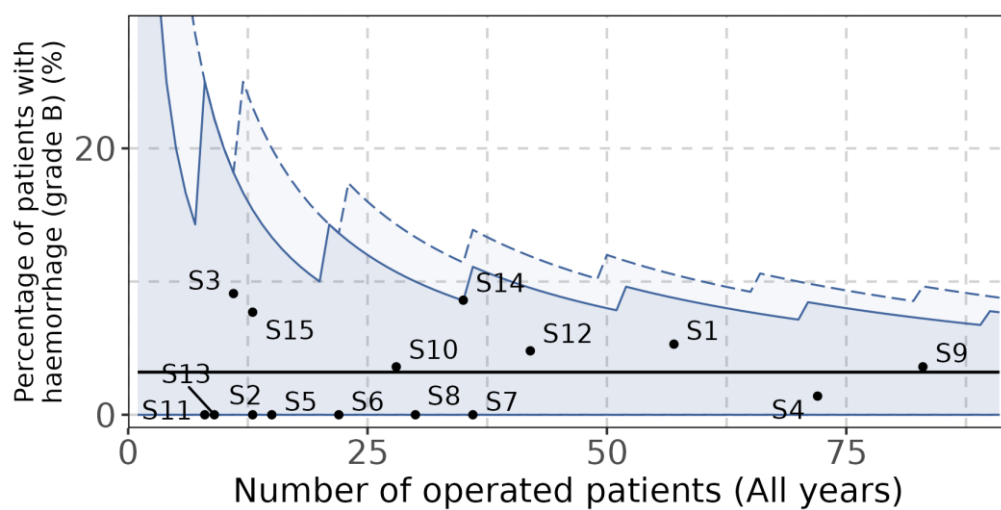
b)



— Belgium — Surgical centers

Figure 46. Funnel and spaghetti plot of operated patients with **haemorrhage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

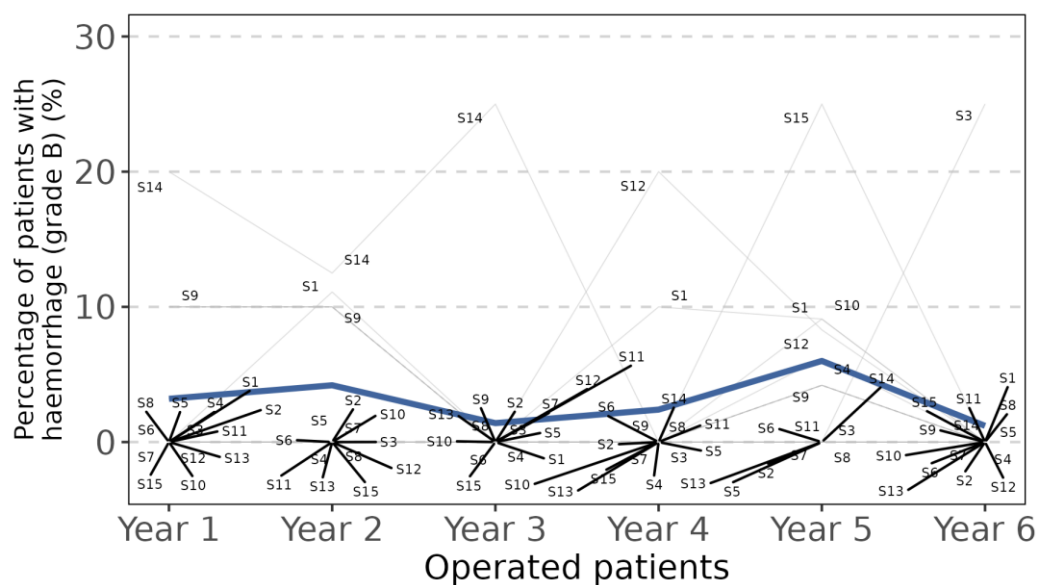
a)



• Surgical center %

— Belgium (3.2%) — 95% — 99%

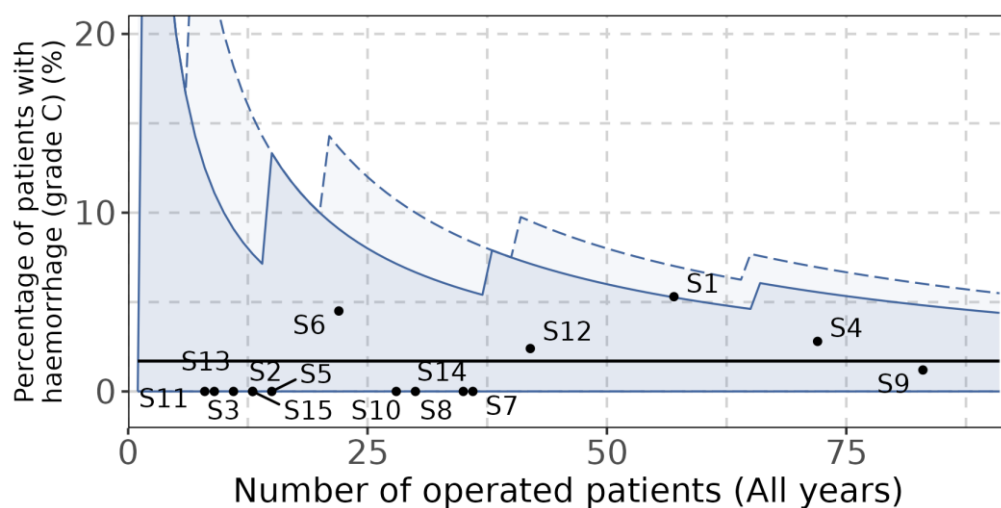
b)



— Belgium — Surgical centers

Figure 47. Funnel and spaghetti plot of operated patients with **haemorrhage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

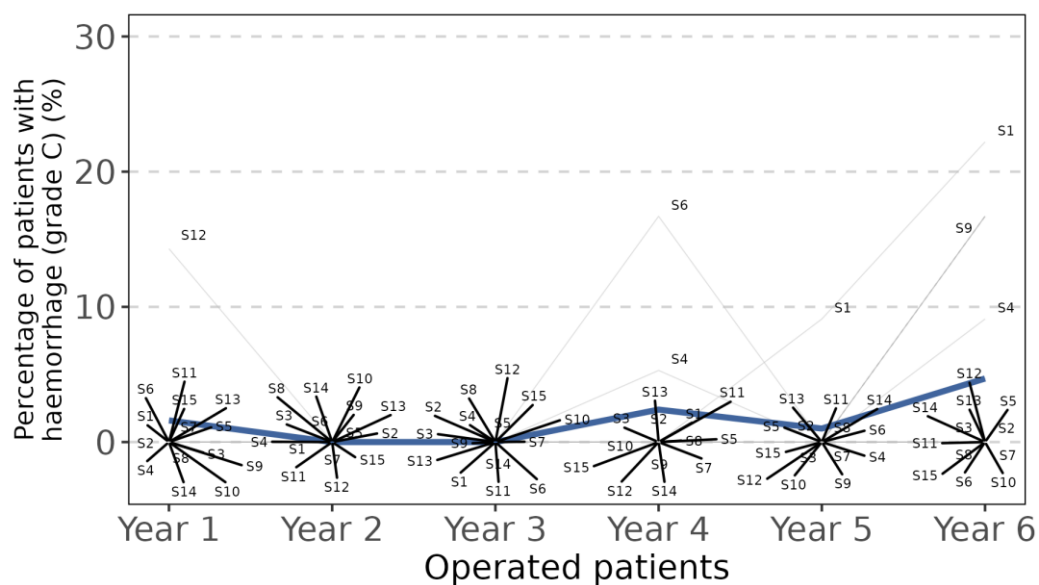
a)



• Surgical center %

— Belgium (1.7%) — 95% -- 99%

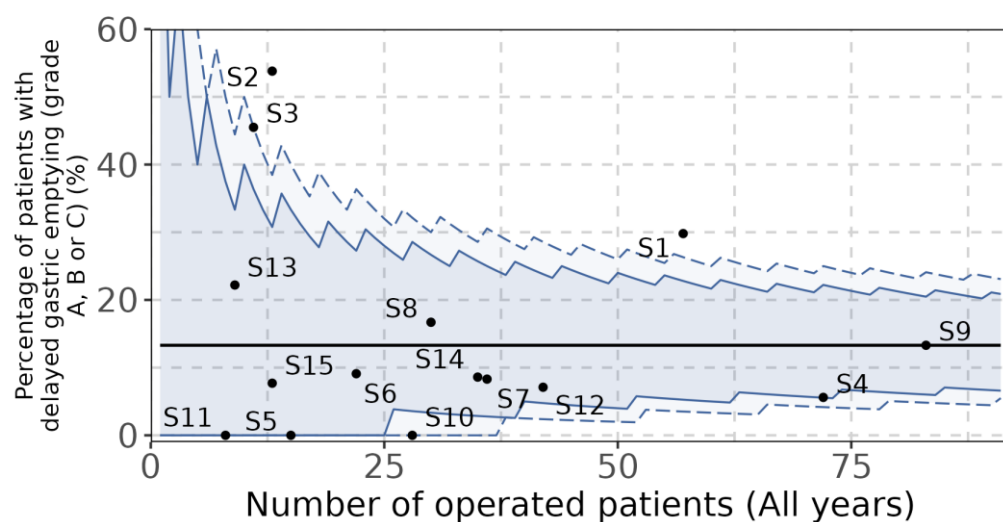
b)



— Belgium — Surgical centers

Figure 48. Funnel and spaghetti plot of operated patients with **delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

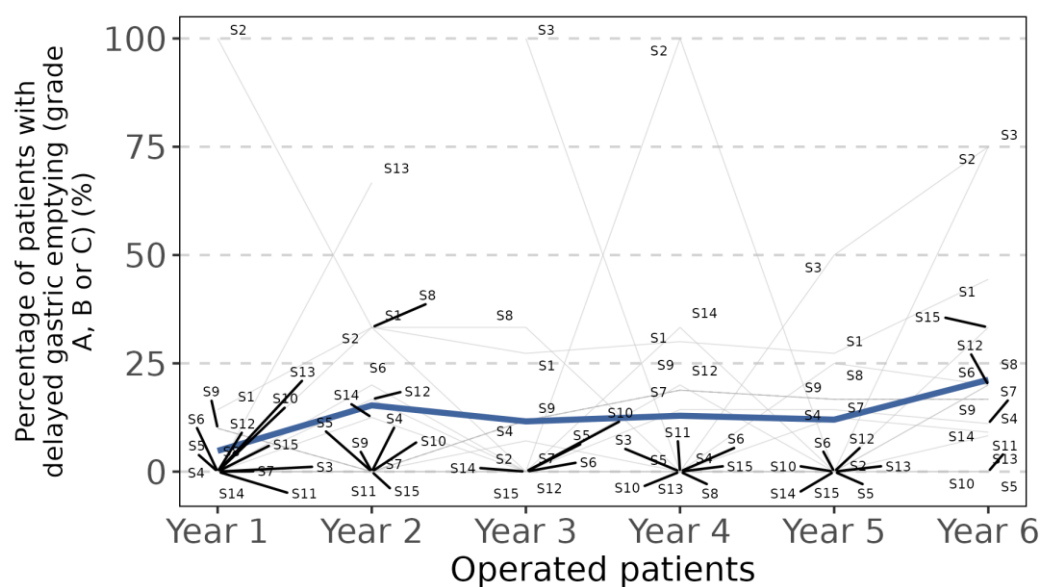
a)



• Surgical center %

— Belgium (13.3%) — 95% -- 99%

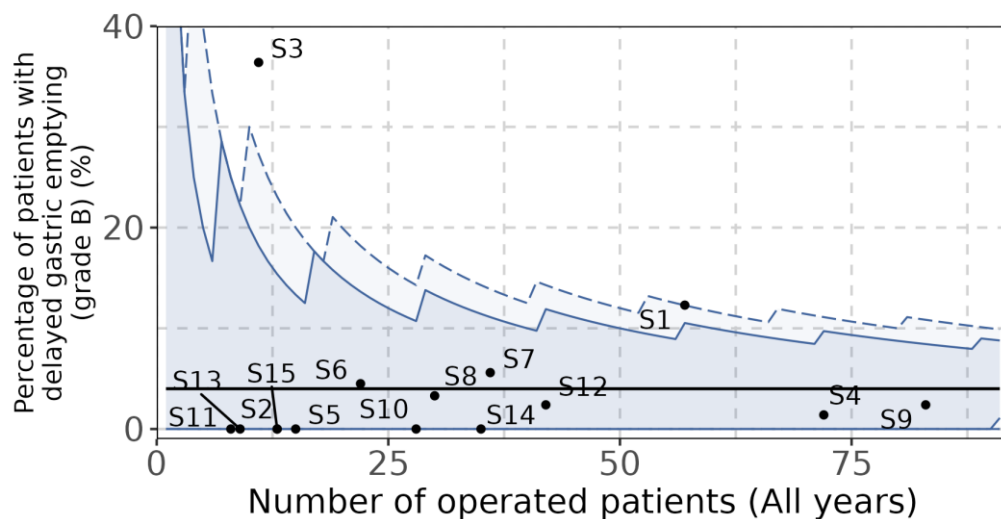
b)



— Belgium — Surgical centers

Figure 49. Funnel and spaghetti plot of operated patients with **delayed gastric emptying (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

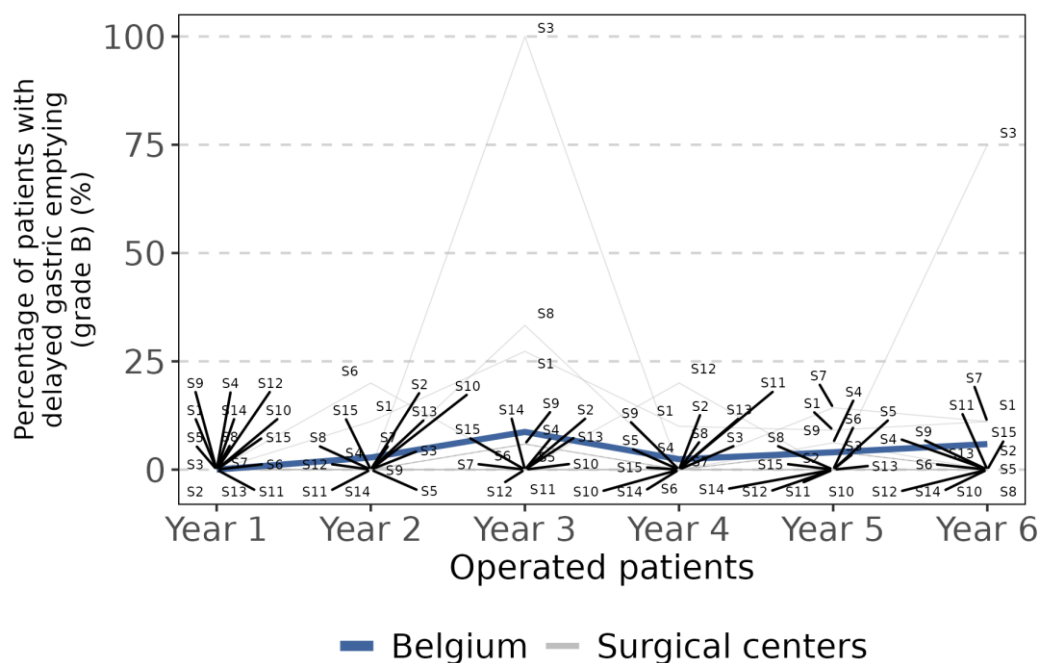
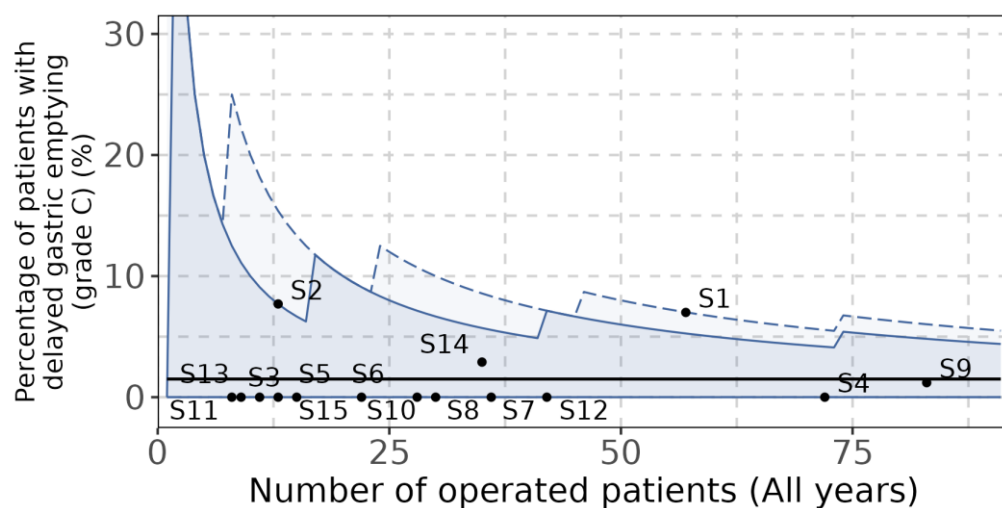


Figure 50. Funnel and spaghetti plot of operated patients with **delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



b)

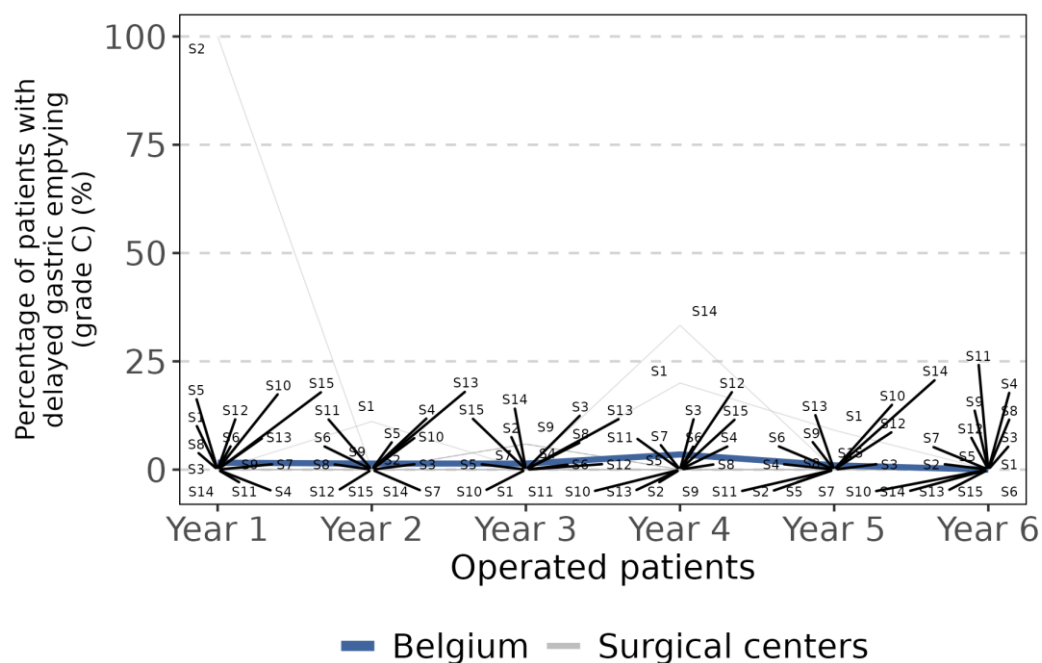
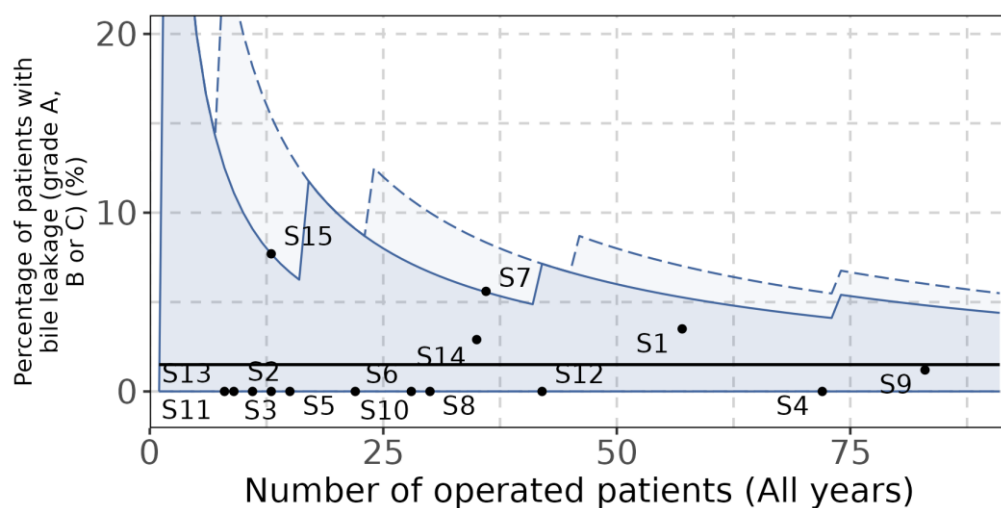


Figure 51. Funnel and spaghetti plot of operated patients with **bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

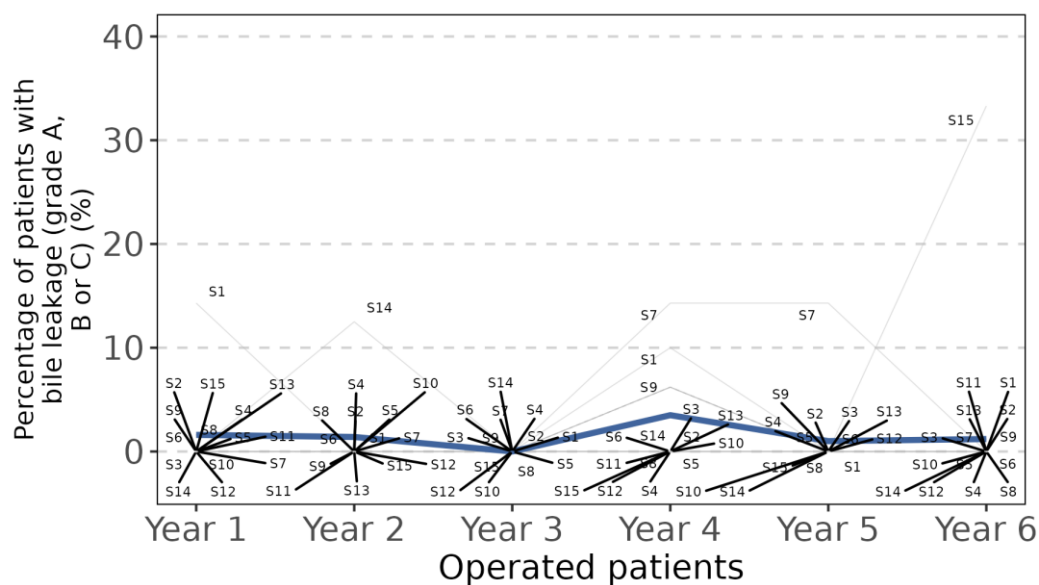
a)



• Surgical center %

— Belgium (1.5%) — 95% -- 99%

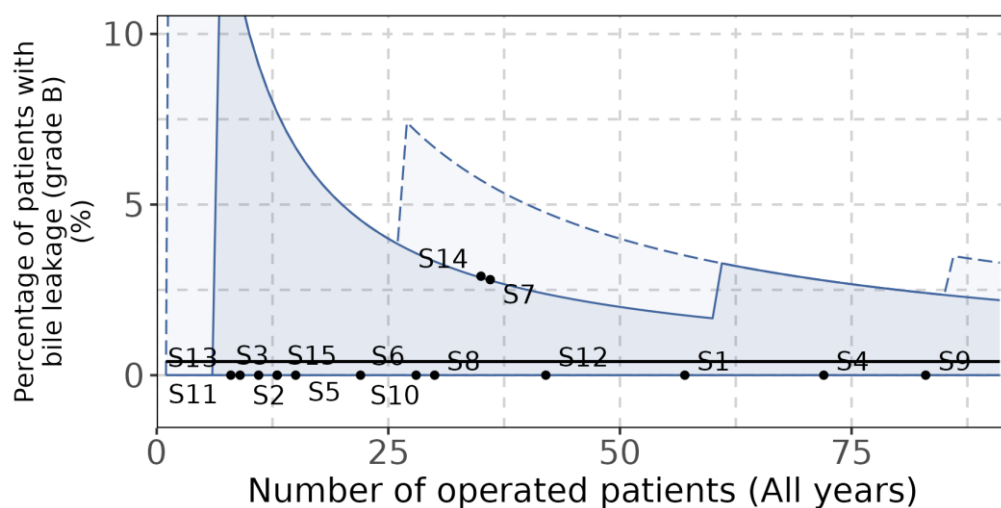
b)



— Belgium — Surgical centers

Figure 52. Funnel and spaghetti plot of operated patients with **bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

a)



• Surgical center %

— Belgium (0.4%) — 95% - - 99%

b)

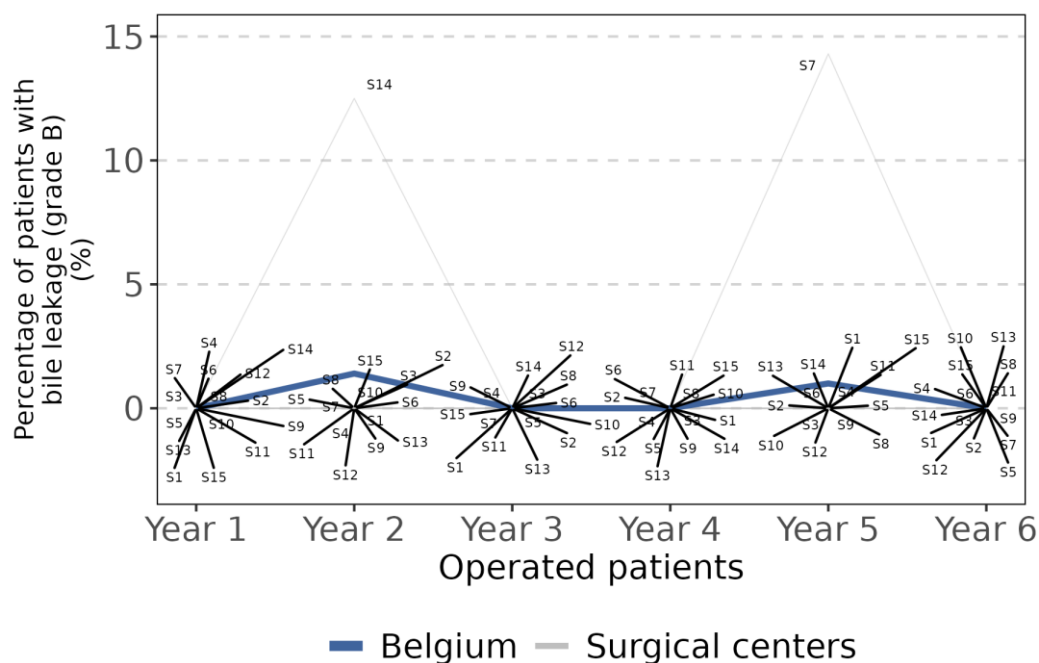
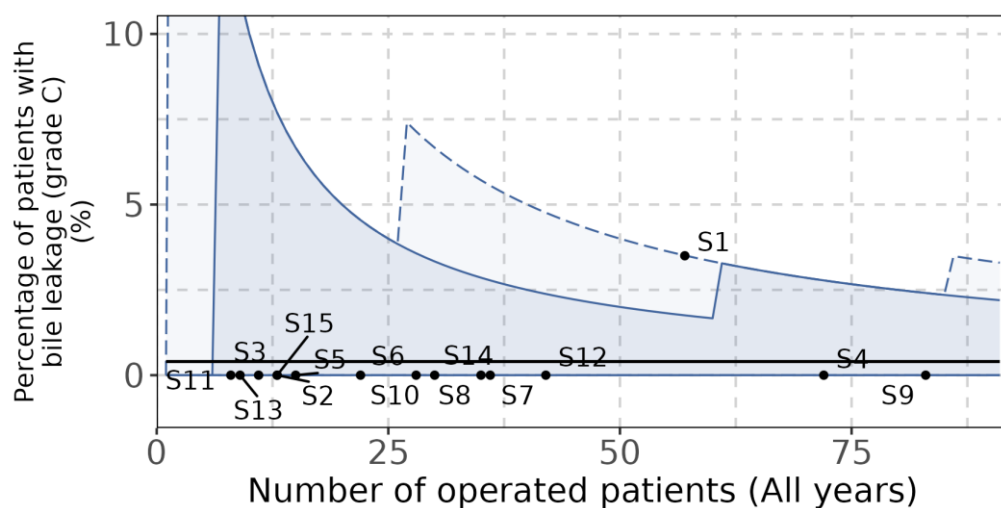


Figure 53. Funnel and spaghetti plot of operated patients with **bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

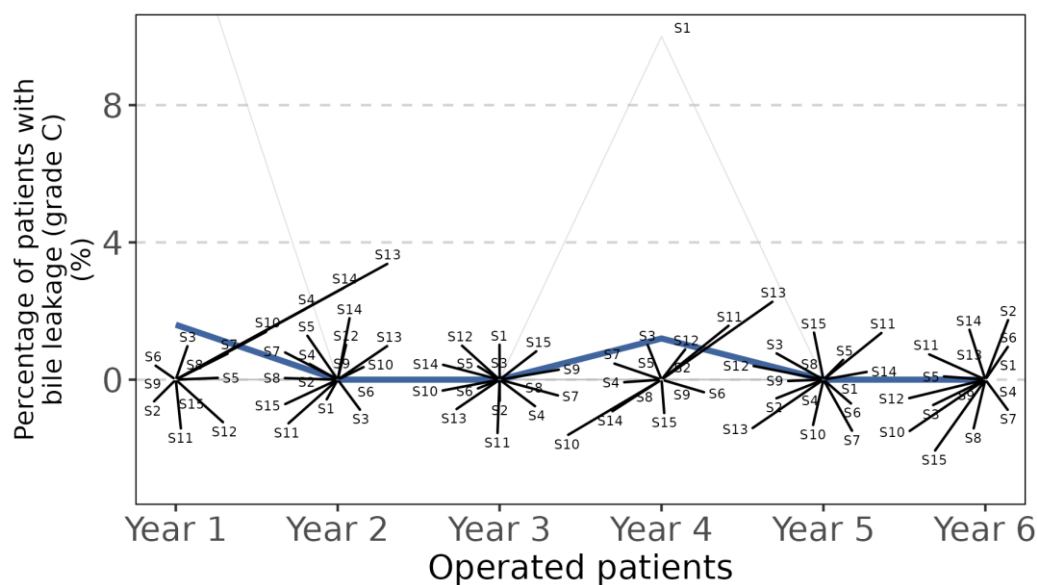
a)



• Surgical center %

— Belgium (0.4%) — 95% - - 99%

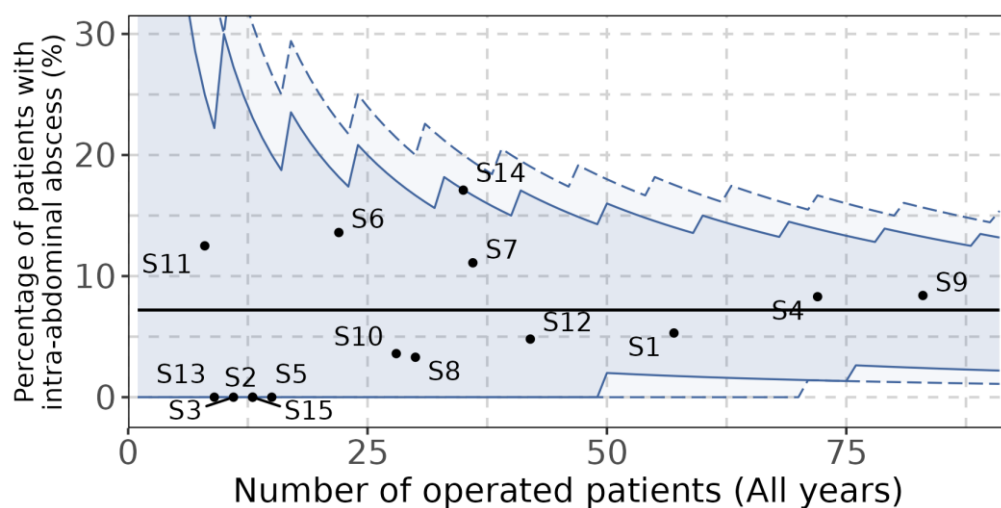
b)



— Belgium — Surgical centers

Figure 54. Funnel and spaghetti plot of operated patients with *intra-abdominal abscess (within 90 days)*, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4, 5 and 6.

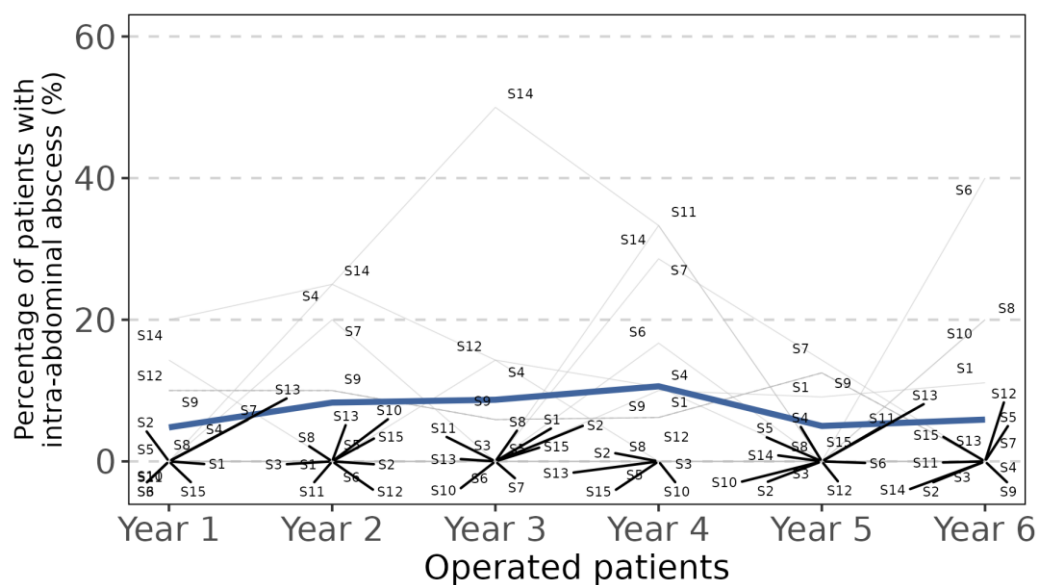
a)



• Surgical center %

— Belgium (7.2%) — 95% -- 99%

b)



— Belgium — Surgical centers

4.3.3.1. Proportion of operated patients with severe surgical complications (Clavien-Dindo grade IIIb-V, 90-day postoperative, in-hospital)

Table 34. Proportion of operated patients with severe surgical complications in the six convention years, by patient and tumour characteristics.

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Operated patients with non-tumoural pathology	474	63	13.3	[10.4, 16.7]
Expert centers				
S1	57	10	17.5	[8.7, 29.9]
S2	13	2	15.4	[1.9, 45.4]
S3	11	0	0.0	[0.0, 28.5]
S4	72	17	23.6	[14.4, 35.1]
S5	15	1	6.7	[0.2, 31.9]
S6	22	3	13.6	[2.9, 34.9]
S7	36	3	8.3	[1.8, 22.5]
S8	30	2	6.7	[0.8, 22.1]
S9	83	9	10.8	[5.1, 19.6]
S10	28	0	0.0	[0.0, 12.3]
S11	8	1	12.5	[0.3, 52.7]
S12	42	5	11.9	[4.0, 25.6]
S13	9	2	22.2	[2.8, 60.0]
S14	35	8	22.9	[10.4, 40.1]
S15	13	0	0.0	[0.0, 24.7]
Convention year				
Year 1	63	9	14.3	[6.7, 25.4]
Year 2	72	7	9.7	[4.0, 19.0]
Year 3	69	7	10.1	[4.2, 19.8]
Year 4	85	13	15.3	[8.4, 24.7]
Year 5	100	14	14.0	[7.9, 22.4]
Year 6	85	13	15.3	[8.4, 24.7]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Sex				
Male	322	45	14.0	[10.4, 18.2]
Female	152	18	11.8	[7.2, 18.1]
Age at surgery				
<=69	407	56	13.8	[10.6, 17.5]
70-79	58	5	8.6	[2.9, 19.0]
>=80	9	2	22.2	[2.8, 60.0]
Prior surgery or other treatment **				
Prior abdominal surgery	97	15	15.5	[8.9, 24.2]
Other treatment modality (that could affect the pancreas)	94	16	17.0	[10.1, 26.2]
Charlson Comorbidity Index				
0	204	26	12.7	[8.5, 18.1]
1	113	13	11.5	[6.3, 18.9]
2	77	14	18.2	[10.3, 28.6]
3	41	5	12.2	[4.1, 26.2]
4	20	2	10.0	[1.2, 31.7]
5	8	2	25.0	[3.2, 65.1]
6	4	1	25.0	[0.6, 80.6]
7				
8	3	0	0.0	[0.0, 70.8]
9	2	0	0.0	[0.0, 84.2]
10	1	0	0.0	[0.0, 97.5]
11	1	0	0.0	[0.0, 97.5]
WHO score at surgery				
0 - Asymptomatic, normal activity	128	20	15.6	[9.8, 23.1]
1 - Symptomatic, but ambulant	284	34	12.0	[8.4, 16.3]
2 - Symptomatic, bedbound < 50% day	48	4	8.3	[2.3, 20.0]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
3 - Symptomatic, bedbound > 50% day	9	1	11.1	[0.3, 48.2]
4 - Completely dependent, 100% bedbound	5	4	80.0	[28.4, 99.5]
ASA score				
1 - Healthy person	28	0	0.0	[0.0, 12.3]
2 - Mild systemic disease, normal activity	247	32	13.0	[9.0, 17.8]
3 - Serious systemic disease, limited activity	191	28	14.7	[10.0, 20.5]
4 - Life-threatening illness, handicapped	7	3	42.9	[9.9, 81.6]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	89	14	15.7	[8.9, 25.0]
Minimally invasive surgery (MIS) - Hybrid	2	0	0.0	[0.0, 84.2]
Minimally invasive surgery (MIS) - Robotic	72	11	15.3	[7.9, 25.7]
Open	285	33	11.6	[8.1, 15.9]
Conversion from MIS to open surgery	26	5	19.2	[6.6, 39.4]
Simultaneous venous resection				
No vascular reconstruction	451	60	13.3	[10.3, 16.8]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	20	3	15.0	[3.2, 37.9]
Simultaneous arterial resection **	2	0	0.0	[0.0, 84.2]
Missing	1	0	0.0	[0.0, 97.5]
Simultaneous other organ resection				
**				
No	295	40	13.6	[9.9, 18.0]
Colon	17	4	23.5	[6.8, 49.9]
Stomach	51	10	19.6	[9.8, 33.1]
Adrenal gland	9	2	22.2	[2.8, 60.0]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Spleen	120	14	11.7	[6.5, 18.8]
Other	31	5	16.1	[5.5, 33.7]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	265	39	14.7	[10.7, 19.6]
Pancreaticoduodenectomy	232	32	13.8	[9.6, 18.9]
Total Pancreatectomy	33	7	21.2	[9.0, 38.9]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	75	8	10.7	[4.7, 19.9]
242874-242885: Hemipancreatectomy left	128	16	12.5	[7.3, 19.5]
242896-242900: Enucleation of a pancreatic tumour	6	0	0.0	[0.0, 45.9]
Antithrombotic medication				
No	364	51	14.0	[10.6, 18.0]
Yes	110	12	10.9	[5.8, 18.3]
Was the patient referred?				
No	288	39	13.5	[9.8, 18.0]
Yes	186	24	12.9	[8.4, 18.6]

**: Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients.

5. Total operated population

5.1. Case mix description for the total operated population

Table 35. Case mix description for **the total operated** population.

Belgium												
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
Characteristic	N	%	N	%	N	%	N	%	N	%	N	%
Patients with surgery	787		928		920		919		1,013		978	
Morphology												
Adenocarcinoma	476	60.5	554	59.7	552	60.0	545	59.3	579	57.2	565	57.8
Neuroendocrine tumour	67	8.5	114	12.3	123	13.4	102	11.1	130	12.8	136	13.9
Benign tumour	126	16.0	135	14.5	112	12.2	118	12.8	112	11.1	108	11.0
Other or unspecified	118	15.0	125	13.5	133	14.5	154	16.8	192	19.0	169	17.3
Type of surgery												
Minimally invasive surgery (MIS) - Laparoscopic	207	26.3	270	29.1	293	31.8	234	25.5	234	23.1	180	18.4
Minimally invasive surgery (MIS) - Hybrid	1	0.1	3	0.3	2	0.2	1	0.1	0	0.0	0	0.0
Minimally invasive surgery (MIS) - Robotic	21	2.7	78	8.4	91	9.9	128	13.9	217	21.4	249	25.5
Open	532	67.6	530	57.1	483	52.5	511	55.6	517	51.0	497	50.8
Conversion from MIS to open surgery	26	3.3	47	5.1	51	5.5	45	4.9	45	4.4	52	5.3
RIZIV code for complex surgery												
242830-242841: Pancreaticoduodenectomy	563	71.5	601	64.8	597	64.9	597	65.0	621	61.3	623	63.7
Pancreaticoduodenectomy	512	90.9	548	91.2	548	91.8	533	89.3	551	88.7	552	88.7
Total Pancreatectomy	51	9.1	53	8.8	49	8.2	64	10.7	70	11.3	70	11.3
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	63	8.0	104	11.2	88	9.6	122	13.3	91	9.0	63	6.4
242874-242885: Hemipancreatectomy left	150	19.1	208	22.4	217	23.6	191	20.8	285	28.1	279	28.5

Belgium												
Characteristic	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
	N	%	N	%	N	%	N	%	N	%	N	%
242896-242900: Enucleation of a pancreatic tumour	11	1.4	15	1.6	18	2.0	9	1.0	16	1.6	13	1.3

5.2. Postoperative mortality for the total operated population

5.2.1. Unadjusted 30-day postoperative mortality

Table 36. Unadjusted 36-day postoperative mortality for **the total operated** population in the six convention years, by patient and tumour characteristics.

Unadjusted 36-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Patients with surgery	5,545	107	1.9	[1.6, 2.3]
Expert centers				
S1	540	13	2.4	[1.3, 4.1]
S2	233	3	1.3	[0.3, 3.7]
S3	168	5	3.0	[1.0, 6.8]
S4	949	16	1.7	[1.0, 2.7]
S5	235	7	3.0	[1.2, 6.0]
S6	524	15	2.9	[1.6, 4.7]
S7	417	1	0.2	[0.0, 1.3]
S8	335	4	1.2	[0.3, 3.0]
S9	624	6	1.0	[0.4, 2.1]
S10	203	1	0.5	[0.0, 2.7]
S11	216	12	5.6	[2.9, 9.5]
S12	311	5	1.6	[0.5, 3.7]
S13	236	6	2.5	[0.9, 5.5]
S14	371	11	3.0	[1.5, 5.2]
S15	183	2	1.1	[0.1, 3.9]
Convention year				
Year 1	787	19	2.4	[1.5, 3.7]
Year 2	928	20	2.2	[1.3, 3.3]
Year 3	920	22	2.4	[1.5, 3.6]
Year 4	919	14	1.5	[0.8, 2.5]
Year 5	1,013	15	1.5	[0.8, 2.4]

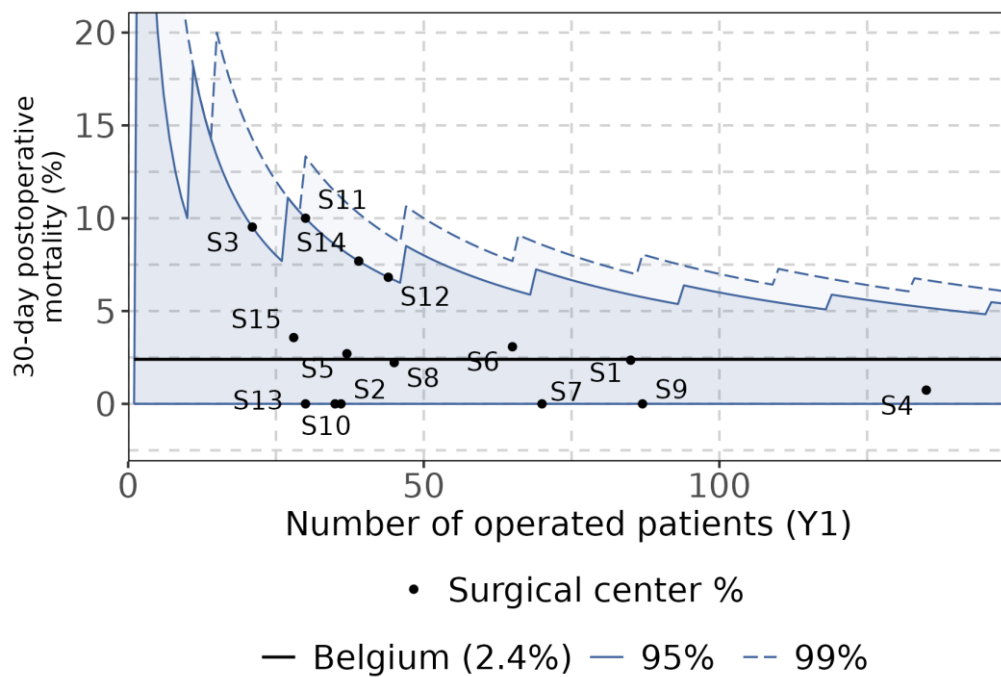
Unadjusted 36-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Year 6	978	17	1.7	[1.0, 2.8]
Sex				
Female	2,516	40	1.6	[1.1, 2.2]
Male	3,029	67	2.2	[1.7, 2.8]
Age at surgery				
<=69	3,242	42	1.3	[0.9, 1.7]
70-79	1,818	47	2.6	[1.9, 3.4]
>=80	485	18	3.7	[2.2, 5.8]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	4,949	100	2.0	[1.6, 2.5]
Relapse of primary tumour	64	2	3.1	[0.4, 10.8]
Metastasis	70	1	1.4	[0.0, 7.7]
Morphology				
Adenocarcinoma	3,271	81	2.5	[2.0, 3.1]
Neuroendocrine tumour	672	7	1.0	[0.4, 2.1]
Benign tumour	711	7	1.0	[0.4, 2.0]
Other or unspecified	891	12	1.3	[0.7, 2.3]
Charlson Comorbidity Index				
0	2,322	20	0.9	[0.5, 1.3]
1	1,339	35	2.6	[1.8, 3.6]
2	887	24	2.7	[1.7, 4.0]
3	444	11	2.5	[1.2, 4.4]
4	253	6	2.4	[0.9, 5.1]
5	113	3	2.7	[0.6, 7.6]
6	87	4	4.6	[1.3, 11.4]
7	44	1	2.3	[0.1, 12.0]
8	33	2	6.1	[0.7, 20.2]

Unadjusted 36-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
9	12	1	8.3	[0.2, 38.5]
10	6	0	0.0	[0.0, 45.9]
11	3	0	0.0	[0.0, 70.8]
12	2	0	0.0	[0.0, 84.2]
WHO score at surgery				
0 - Asymptomatic, normal activity	1,686	21	1.2	[0.8, 1.9]
1 - Symptomatic, but ambulant	3,230	63	2.0	[1.5, 2.5]
2 - Symptomatic, bedbound < 50% day	532	18	3.4	[2.0, 5.3]
3 - Symptomatic, bedbound > 50% day	89	3	3.4	[0.7, 9.5]
4 - Completely dependent, 100% bedbound	8	2	25.0	[3.2, 65.1]
ASA score				
1 - Healthy person	335	4	1.2	[0.3, 3.0]
2 - Mild systemic disease, normal activity	2,883	42	1.5	[1.1, 2.0]
3 - Serious systemic disease, limited activity	2,264	57	2.5	[1.9, 3.2]
4 - Life-threatening illness, handicapped	62	4	6.5	[1.8, 15.7]
5 - Dying	1	0	0.0	[0.0, 97.5]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	1,418	14	1.0	[0.5, 1.7]
Minimally invasive surgery (MIS) - Hybrid	7	0	0.0	[0.0, 41.0]
Minimally invasive surgery (MIS) - Robotic	784	13	1.7	[0.9, 2.8]
Open	3,070	69	2.2	[1.8, 2.8]
Conversion from MIS to open surgery	266	11	4.1	[2.1, 7.3]
RIZIV code for complex surgery				

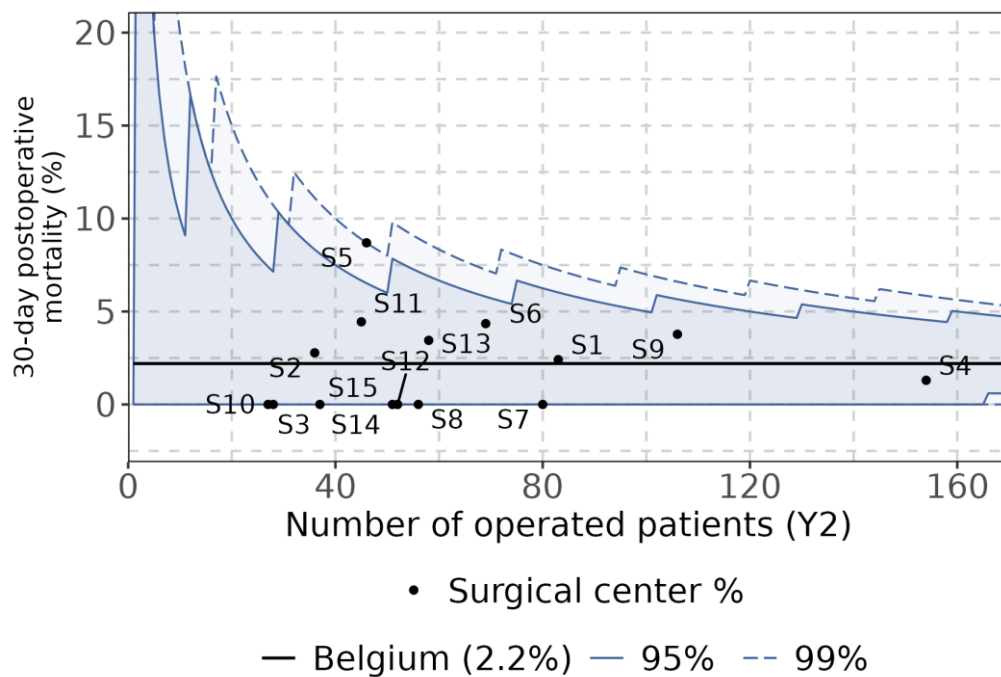
Unadjusted 36-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
242830-242841: Pancreaticoduodenectomy	3,602	90	2.5	[2.0, 3.1]
Pancreaticoduodenectomy	3,244	82	2.5	[2.0, 3.1]
Total Pancreatectomy	357	8	2.2	[1.0, 4.4]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	531	6	1.1	[0.4, 2.4]
242874-242885: Hemipancreatectomy left	1,330	10	0.8	[0.4, 1.4]
242896-242900: Enucleation of a pancreatic tumour	82	1	1.2	[0.0, 6.6]
Antithrombotic medication				
No	3,942	55	1.4	[1.1, 1.8]
Yes	1,603	52	3.2	[2.4, 4.2]
Was the patient referred?				
No	2,616	46	1.8	[1.3, 2.3]
Yes	2,929	61	2.1	[1.6, 2.7]

Figure 55. Funnel and spaghetti plot of the unadjusted 30-day postoperative mortality for the **total operated population** in the six convention years, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

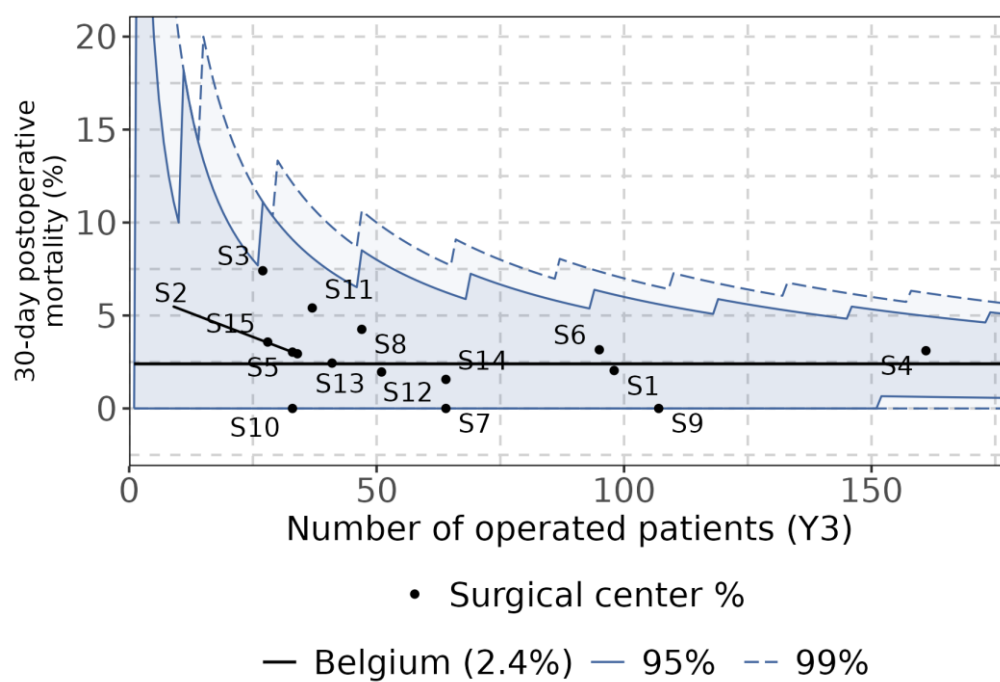
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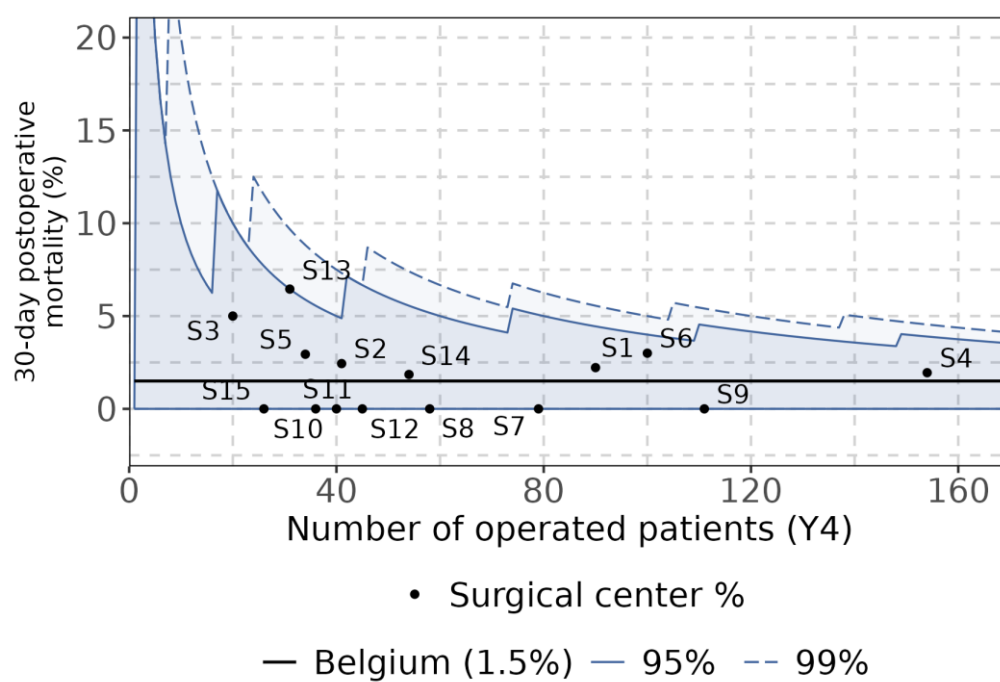
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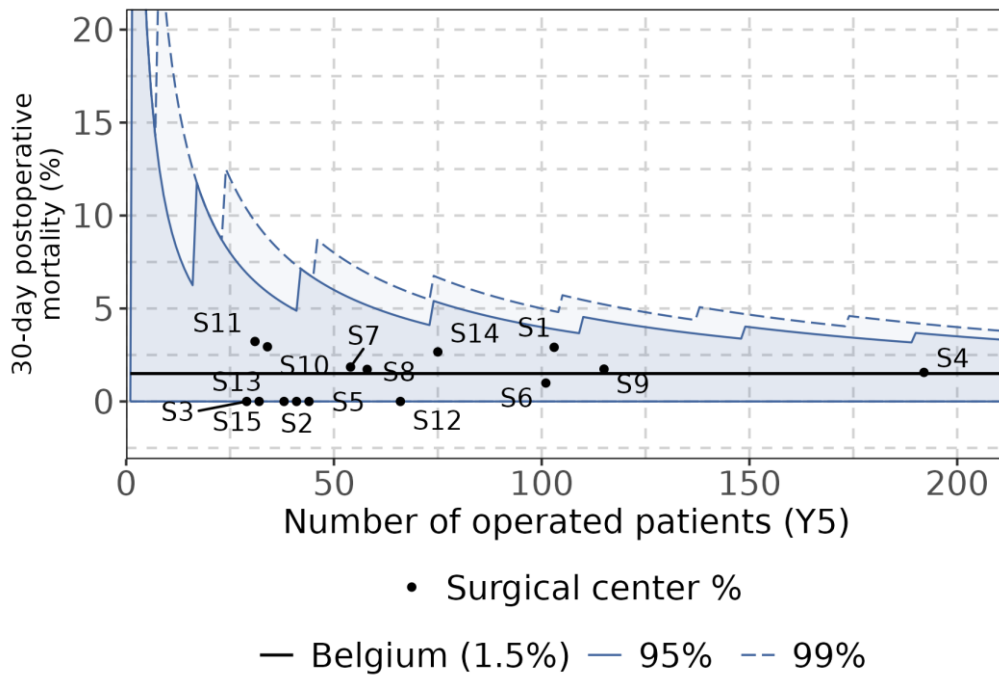
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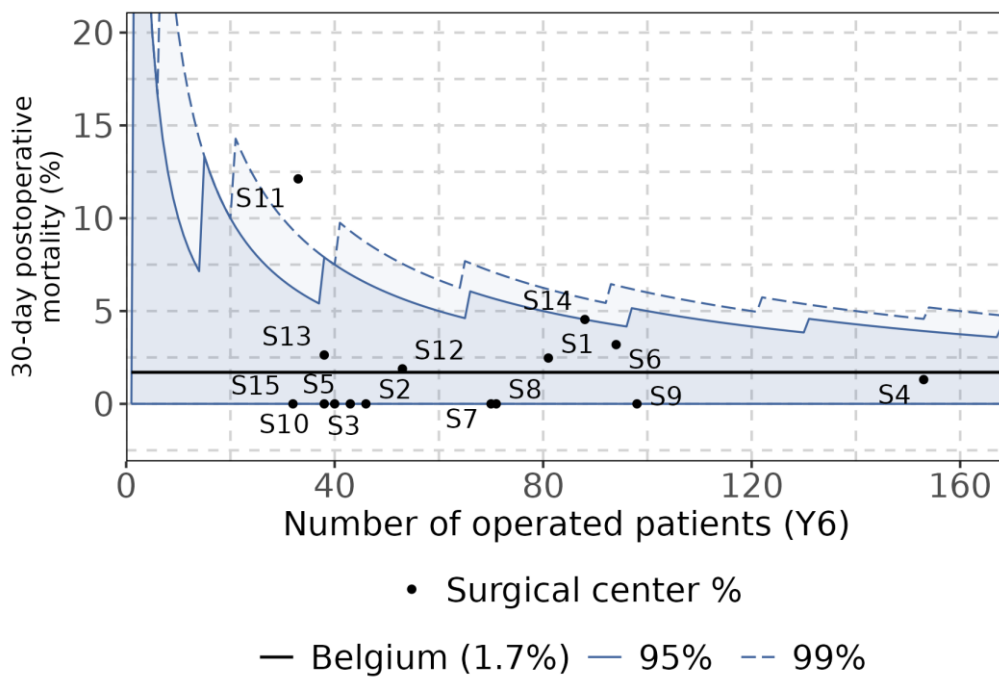
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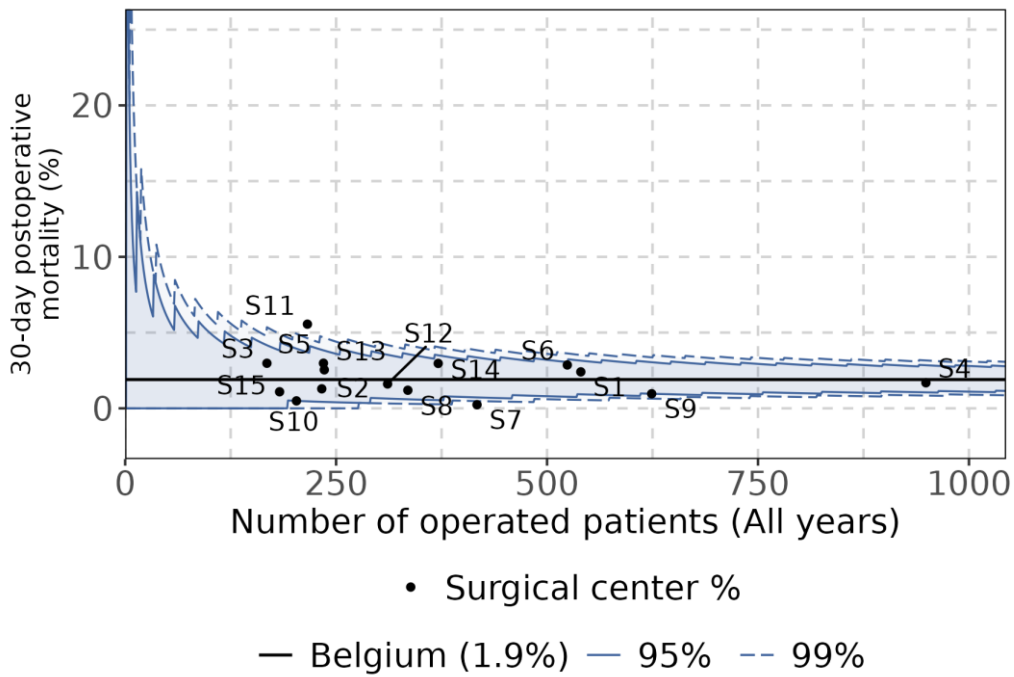
e)



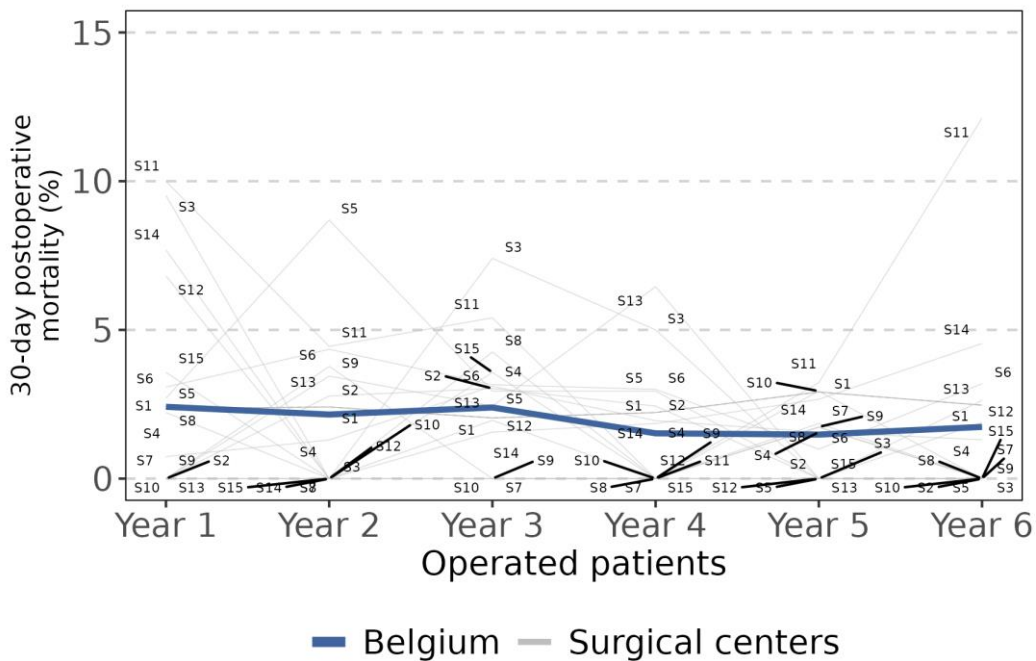
f)



g)



h)



5.2.2. Unadjusted 90-day postoperative mortality

Table 37. Unadjusted 90-day postoperative mortality for **the total operated** population in the six convention years, by patient and tumour characteristics.

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Patients with surgery	5,545	224	4.0	[3.5, 4.6]
Expert centers				
S1	540	24	4.4	[2.9, 6.5]
S2	233	13	5.6	[3.0, 9.4]
S3	168	8	4.8	[2.1, 9.2]
S4	949	33	3.5	[2.4, 4.8]
S5	235	9	3.8	[1.8, 7.1]
S6	524	28	5.3	[3.6, 7.6]
S7	417	6	1.4	[0.5, 3.1]
S8	335	12	3.6	[1.9, 6.2]
S9	624	15	2.4	[1.4, 3.9]
S10	203	10	4.9	[2.4, 8.9]
S11	216	20	9.3	[5.7, 13.9]
S12	311	9	2.9	[1.3, 5.4]
S13	236	9	3.8	[1.8, 7.1]
S14	371	17	4.6	[2.7, 7.2]
S15	183	11	6.0	[3.0, 10.5]
Convention year				
Year 1	787	36	4.6	[3.2, 6.3]
Year 2	928	49	5.3	[3.9, 6.9]
Year 3	920	45	4.9	[3.6, 6.5]
Year 4	919	30	3.3	[2.2, 4.6]
Year 5	1,013	33	3.3	[2.3, 4.5]
Year 6	978	31	3.2	[2.2, 4.5]
Sex				

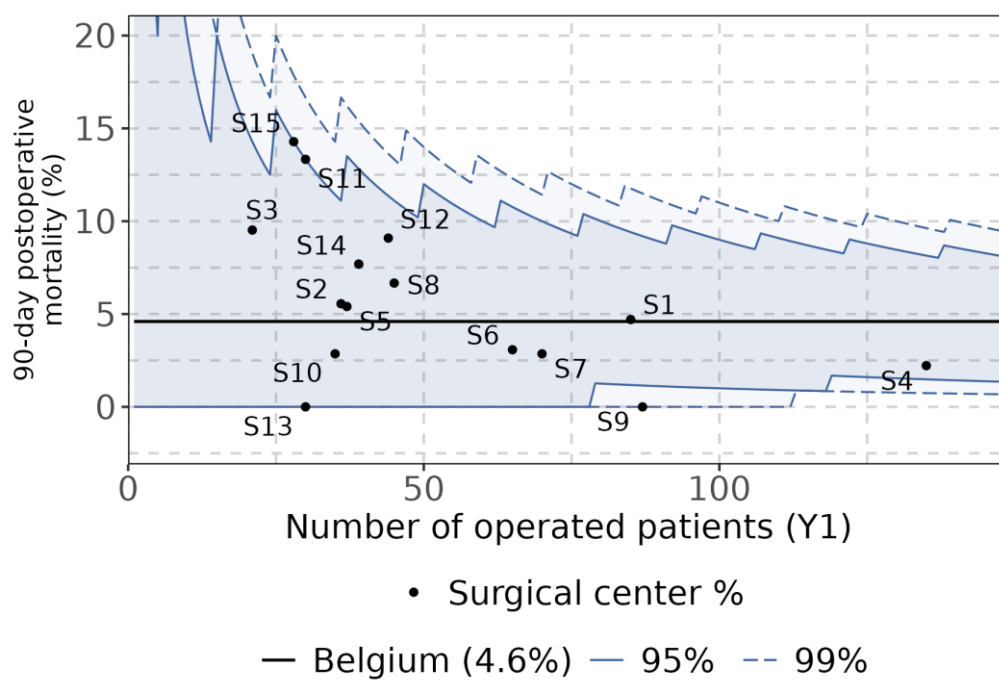
Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
Female	2,516	97	3.9	[3.1, 4.7]
Male	3,029	127	4.2	[3.5, 5.0]
Age at surgery				
<=69	3,242	83	2.6	[2.0, 3.2]
70-79	1,818	107	5.9	[4.8, 7.1]
>=80	485	34	7.0	[4.9, 9.7]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	4,949	206	4.2	[3.6, 4.8]
Relapse of primary tumour	64	4	6.2	[1.7, 15.2]
Metastasis	70	3	4.3	[0.9, 12.0]
Morphology				
Adenocarcinoma	3,271	172	5.3	[4.5, 6.1]
Neuroendocrine tumour	672	16	2.4	[1.4, 3.8]
Benign tumour	711	12	1.7	[0.9, 2.9]
Other or unspecified	891	24	2.7	[1.7, 4.0]
Charlson Comorbidity Index				
0	2,322	54	2.3	[1.8, 3.0]
1	1,339	64	4.8	[3.7, 6.1]
2	887	41	4.6	[3.3, 6.2]
3	444	21	4.7	[3.0, 7.1]
4	253	17	6.7	[4.0, 10.5]
5	113	10	8.8	[4.3, 15.7]
6	87	8	9.2	[4.1, 17.3]
7	44	3	6.8	[1.4, 18.7]
8	33	3	9.1	[1.9, 24.3]
9	12	1	8.3	[0.2, 38.5]
10	6	2	33.3	[4.3, 77.7]
11	3	0	0.0	[0.0, 70.8]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
12	2	0	0.0	[0.0, 84.2]
WHO score at surgery				
0 - Asymptomatic, normal activity	1,686	43	2.6	[1.9, 3.4]
1 - Symptomatic, but ambulant	3,230	123	3.8	[3.2, 4.5]
2 - Symptomatic, bedbound < 50% day	532	45	8.5	[6.2, 11.2]
3 - Symptomatic, bedbound > 50% day	89	10	11.2	[5.5, 19.7]
4 - Completely dependent, 100% bedbound	8	3	37.5	[8.5, 75.5]
ASA score				
1 - Healthy person	335	7	2.1	[0.8, 4.3]
2 - Mild systemic disease, normal activity	2,883	95	3.3	[2.7, 4.0]
3 - Serious systemic disease, limited activity	2,264	116	5.1	[4.3, 6.1]
4 - Life-threatening illness, handicapped	62	6	9.7	[3.6, 19.9]
5 - Dying	1	0	0.0	[0.0, 97.5]
Type of surgery				
Minimally invasive surgery (MIS) - Laparoscopic	1,418	31	2.2	[1.5, 3.1]
Minimally invasive surgery (MIS) - Hybrid	7	1	14.3	[0.4, 57.9]
Minimally invasive surgery (MIS) - Robotic	784	23	2.9	[1.9, 4.4]
Open	3,070	150	4.9	[4.2, 5.7]
Conversion from MIS to open surgery	266	19	7.1	[4.4, 10.9]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	3,602	182	5.1	[4.4, 5.8]
Pancreaticoduodenectomy	3,244	162	5.0	[4.3, 5.8]
Total Pancreatectomy	357	20	5.6	[3.5, 8.5]

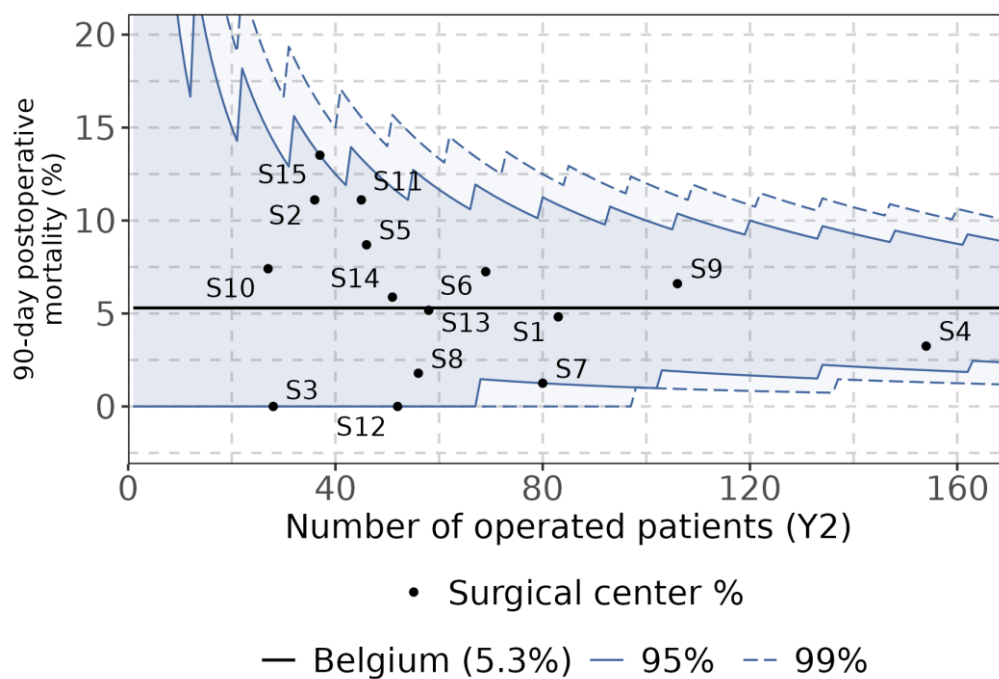
Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N deaths	%	95% CI
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	531	12	2.3	[1.2, 3.9]
242874-242885: Hemipancreatectomy left	1,330	29	2.2	[1.5, 3.1]
242896-242900: Enucleation of a pancreatic tumour	82	1	1.2	[0.0, 6.6]
<i>Antithrombotic medication</i>				
No	3,942	134	3.4	[2.9, 4.0]
Yes	1,603	90	5.6	[4.5, 6.9]
<i>Was the patient referred?</i>				
No	2,616	95	3.6	[2.9, 4.4]
Yes	2,929	129	4.4	[3.7, 5.2]

Figure 56. Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality for the **total operated population** in the six convention years, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) years 6, (g) all years combined, (h) evolution year 1, 2, 3, 4, 5 and 6.

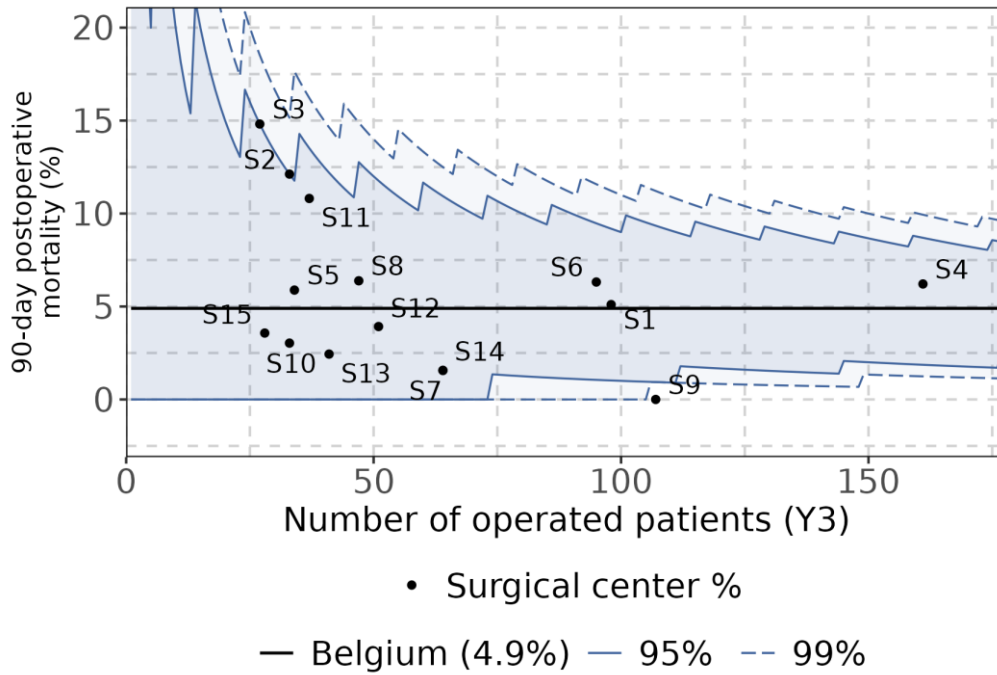
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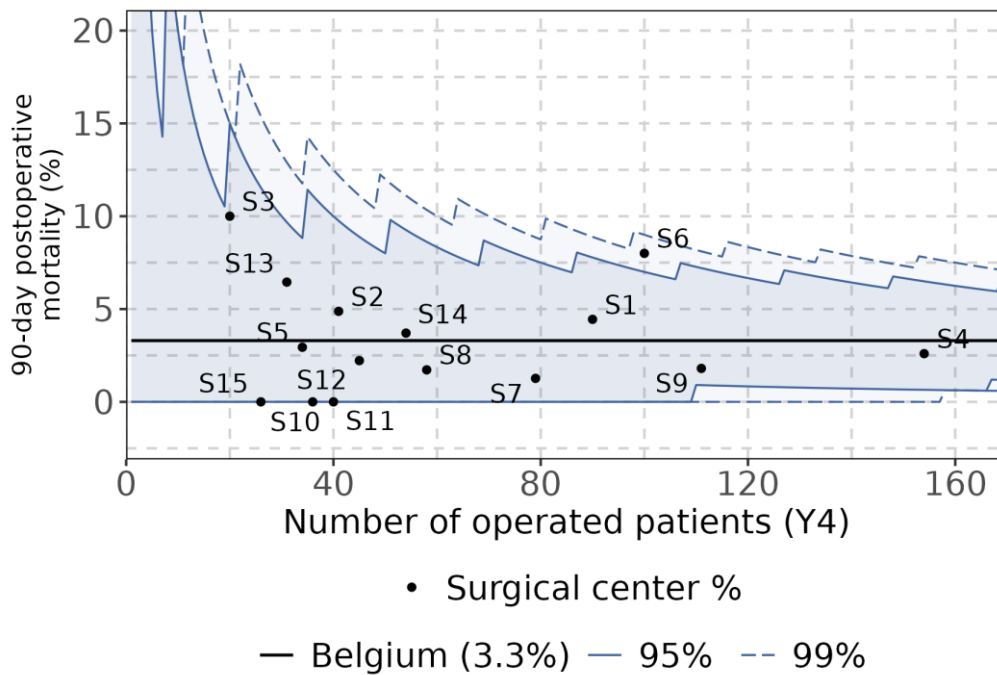
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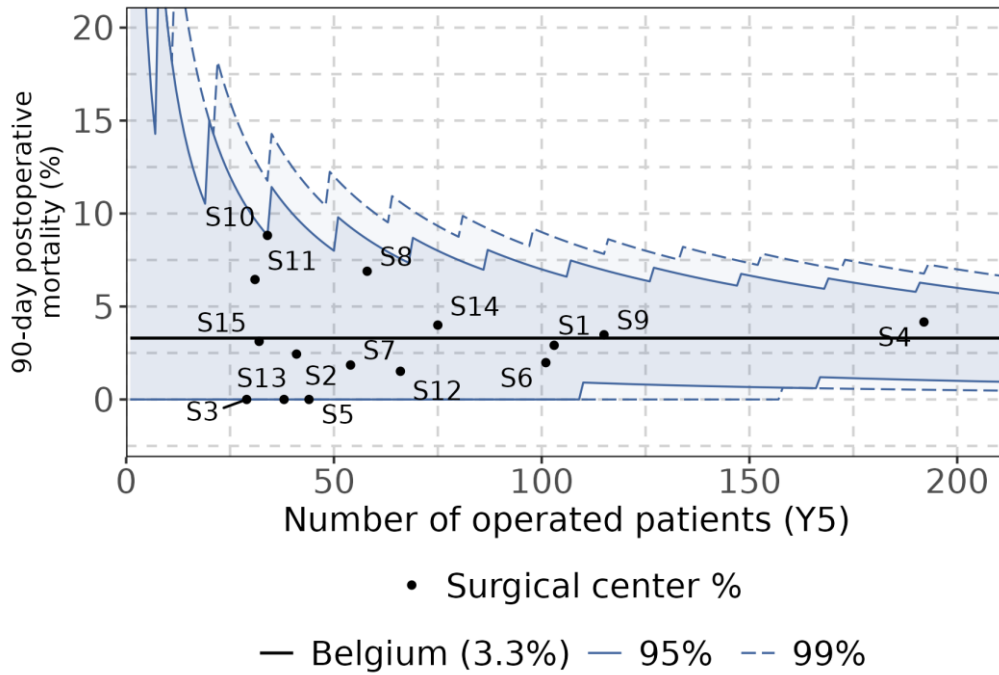
c)



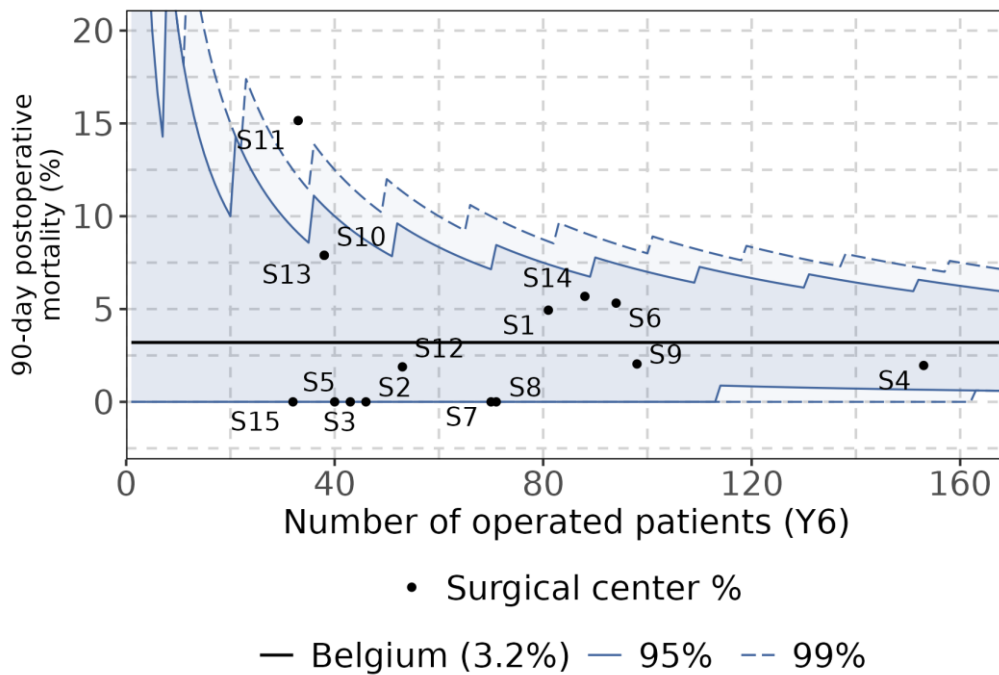
d)



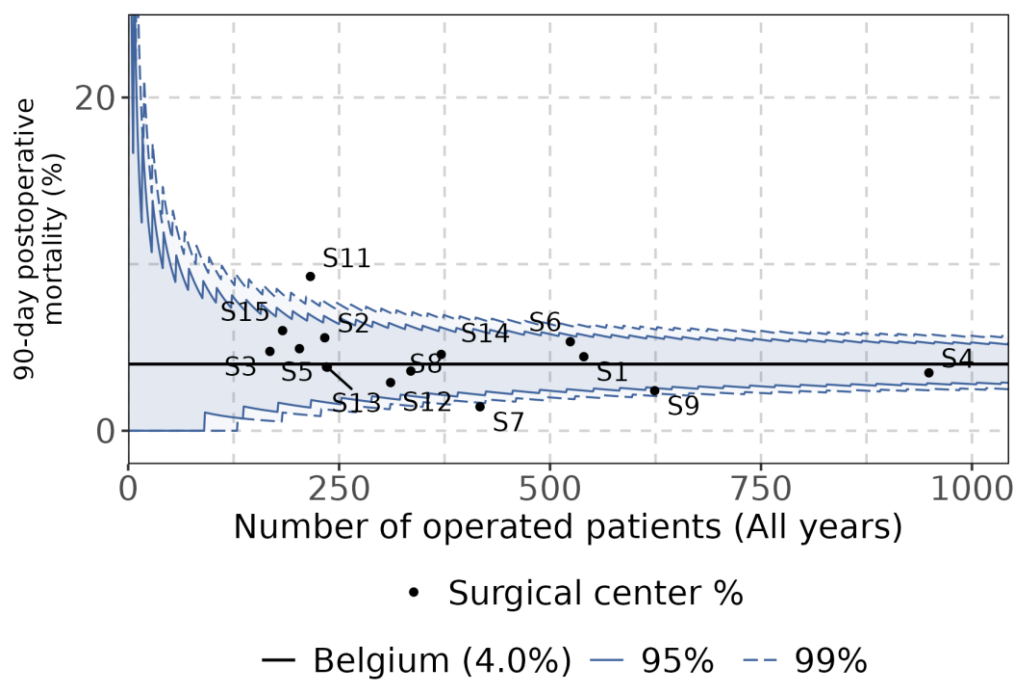
e)



f)



g)



h)

