

Belgian Cancer Registry



RIZIV/INAMI convention Complex Surgery

Pancreas and peri-ampullary region

Global report

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Belgian Cancer Registry Team

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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 three 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 third convention year the indicator 'completeness of registration' will include all the data of the three 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 - 30/06/2022.
- In case of no surgery: date of MC 1/07/2019 - 30/06/2022.

Remark:

- 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.
- In case that the same patient had multiple separate surgeries during the convention period, the different registrations were assessed individually to determine which registration was retained for the report.
- 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 consult (MC), distribution of indication type by surgery type and by expert centre.

Patient group	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>N patients discussed on a MC</i>	1,951	–	2,228	–	2,390	–
<i>N patients with surgery</i>	787	40.3^a	928	41.7^a	920	38.5^a
<i>Pathology type</i>						
Malignant tumour	598	76.0 ^b	721	77.7 ^b	739	80.3 ^b
Benign tumour	126	16.0 ^b	135	14.5 ^b	112	12.2 ^b
Non-tumoural	63	8.0 ^b	72	7.8 ^b	69	7.5 ^b
<i>Type of surgery</i>						
242830-242841: Pancreaticoduodenectomy	563	71.5 ^b	601	64.8 ^b	597	64.9 ^b
Pancreaticoduodenectomy	512	90.9 ^c	548	91.2 ^c	548	91.8 ^c
Total Pancreatectomy	51	9.1 ^c	53	8.8 ^c	49	8.2 ^c
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
242874-242885: Hemipancreatectomy left	150	19.1 ^b	208	22.4 ^b	217	23.6 ^b
242896-242900: Enucleation of a pancreatic tumour	11	1.4 ^b	15	1.6 ^b	18	2.0 ^b
<i>Expert centres</i>						
S1	45	5.7 ^b	56	6.0 ^b	47	5.1 ^b
S2	135	17.2 ^b	154	16.6 ^b	161	17.5 ^b
S3	30	3.8 ^b	45	4.8 ^b	37	4.0 ^b
S4	28	3.6 ^b	37	4.0 ^b	28	3.0 ^b
S5	85	10.8 ^b	83	8.9 ^b	98	10.7 ^b
S6	21	2.7 ^b	28	3.0 ^b	27	2.9 ^b
S7	36	4.6 ^b	36	3.9 ^b	33	3.6 ^b
S8	65	8.3 ^b	69	7.4 ^b	95	10.3 ^b
S9	35	4.4 ^b	27	2.9 ^b	33	3.6 ^b
S10	70	8.9 ^b	80	8.6 ^b	64	7.0 ^b
S11	44	5.6 ^b	52	5.6 ^b	51	5.5 ^b
S12	37	4.7 ^b	46	5.0 ^b	34	3.7 ^b
S13	87	11.1 ^b	106	11.4 ^b	107	11.6 ^b
S14	30	3.8 ^b	58	6.3 ^b	41	4.5 ^b
S15	39	5.0 ^b	51	5.5 ^b	64	7.0 ^b
<i>N patients without surgery</i>	1,164	59.7^a	1,300	58.3^a	1,470	61.5^a
<i>Pathology type</i>						

Patient group	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
Malignant tumour	738	63.4 ^b	747	57.5 ^b	821	55.9 ^b
Benign tumour	265	22.8 ^b	371	28.5 ^b	393	26.7 ^b
Non-tumoural	161	13.8 ^b	182	14.0 ^b	256	17.4 ^b
Expert centres						
S1	81	7.0 ^b	99	7.6 ^b	114	7.8 ^b
S2	108	9.3 ^b	154	11.8 ^b	184	12.5 ^b
S3	75	6.4 ^b	85	6.5 ^b	62	4.2 ^b
S4	69	5.9 ^b	36	2.8 ^b	44	3.0 ^b
S5	60	5.2 ^b	72	5.5 ^b	73	5.0 ^b
S6	29	2.5 ^b	47	3.6 ^b	91	6.2 ^b
S7	64	5.5 ^b	79	6.1 ^b	100	6.8 ^b
S8	118	10.1 ^b	112	8.6 ^b	122	8.3 ^b
S9	108	9.3 ^b	100	7.7 ^b	66	4.5 ^b
S10	82	7.0 ^b	97	7.5 ^b	104	7.1 ^b
S11	51	4.4 ^b	73	5.6 ^b	77	5.2 ^b
S12	48	4.1 ^b	24	1.8 ^b	51	3.5 ^b
S13	101	8.7 ^b	72	5.5 ^b	78	5.3 ^b
S14	87	7.5 ^b	112	8.6 ^b	115	7.8 ^b
S15	83	7.1 ^b	138	10.6 ^b	189	12.9 ^b

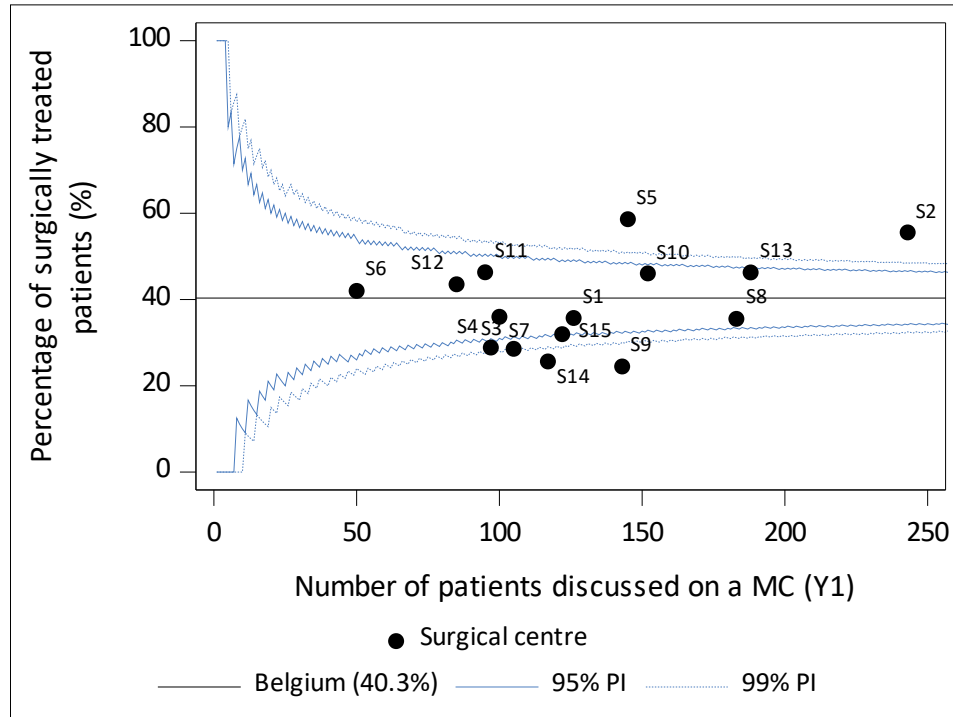
^a percentage relative to the number of patients with MC

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

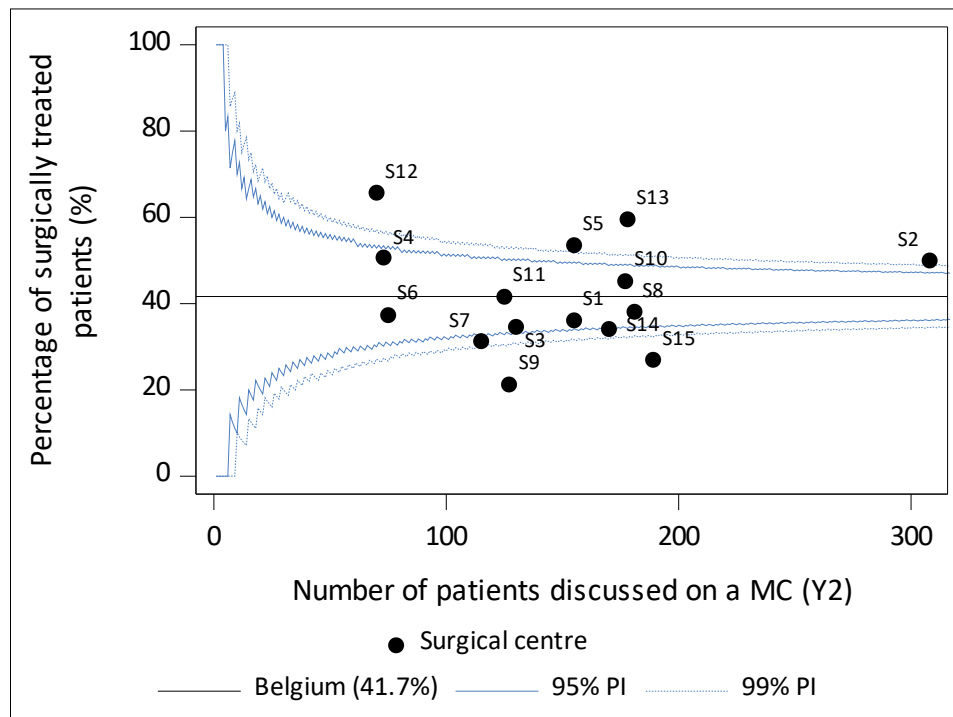
^c percentage relative to the number of patients with 242830-242841 Pancreaticoduodenectomy as type of surgery

Figure 1: Funnel and spaghetti plot of the proportion of patients discussed on a MC who were treated surgically by an individual expert centre, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

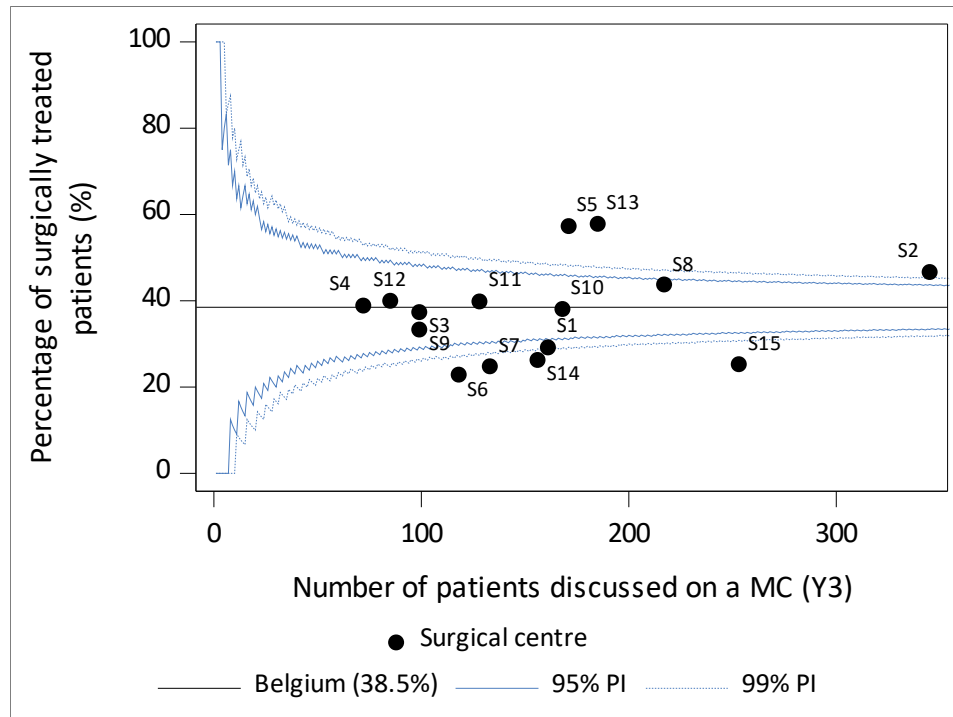
(a)



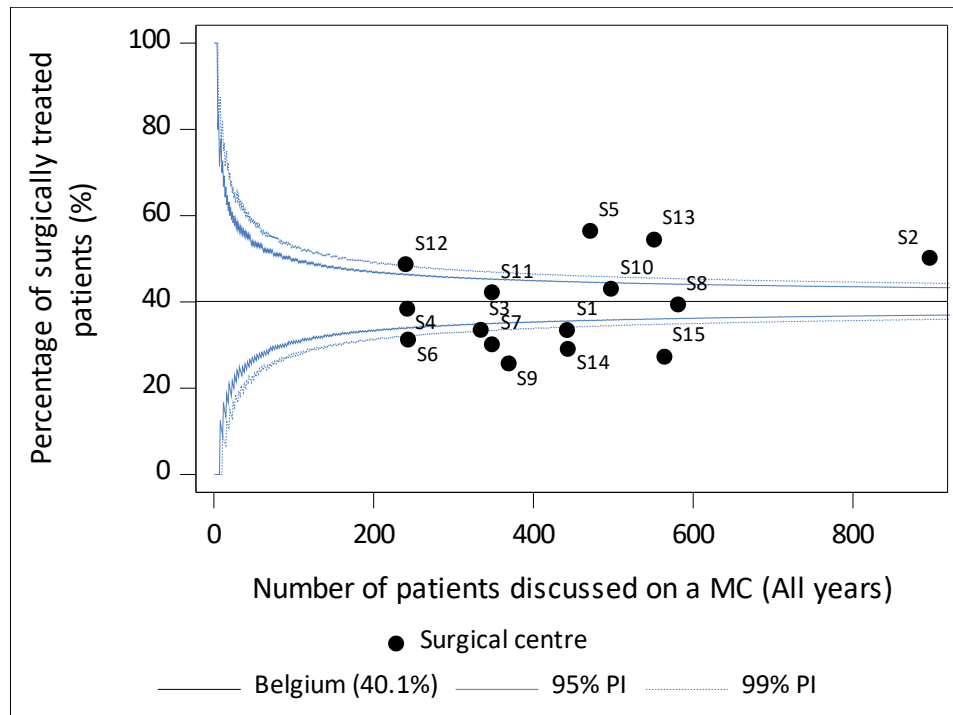
(b)



(c)



(d)



(e)

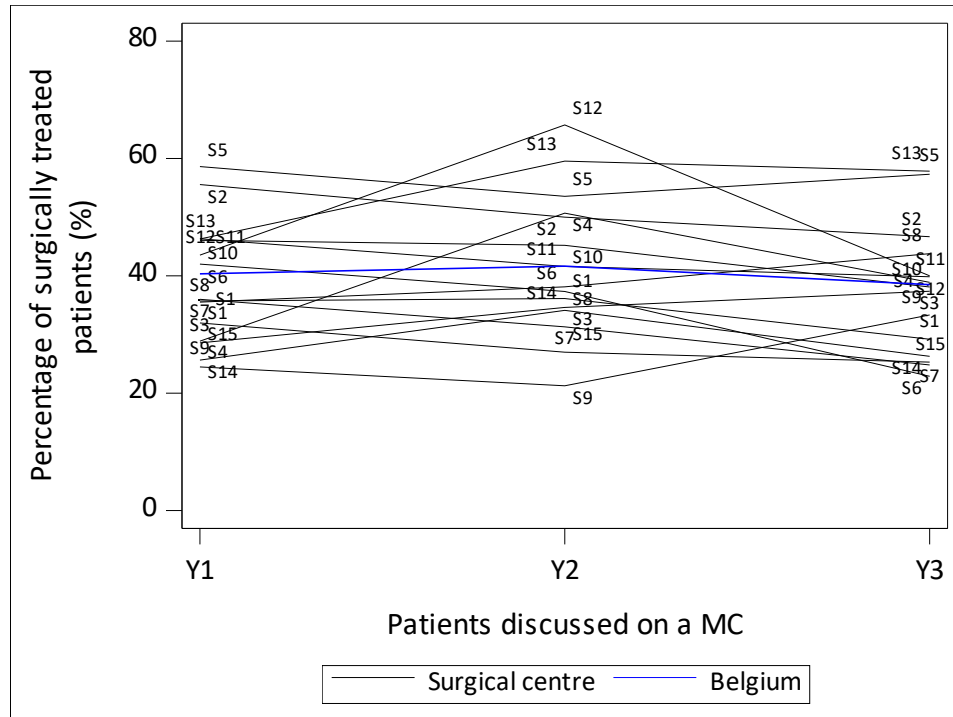
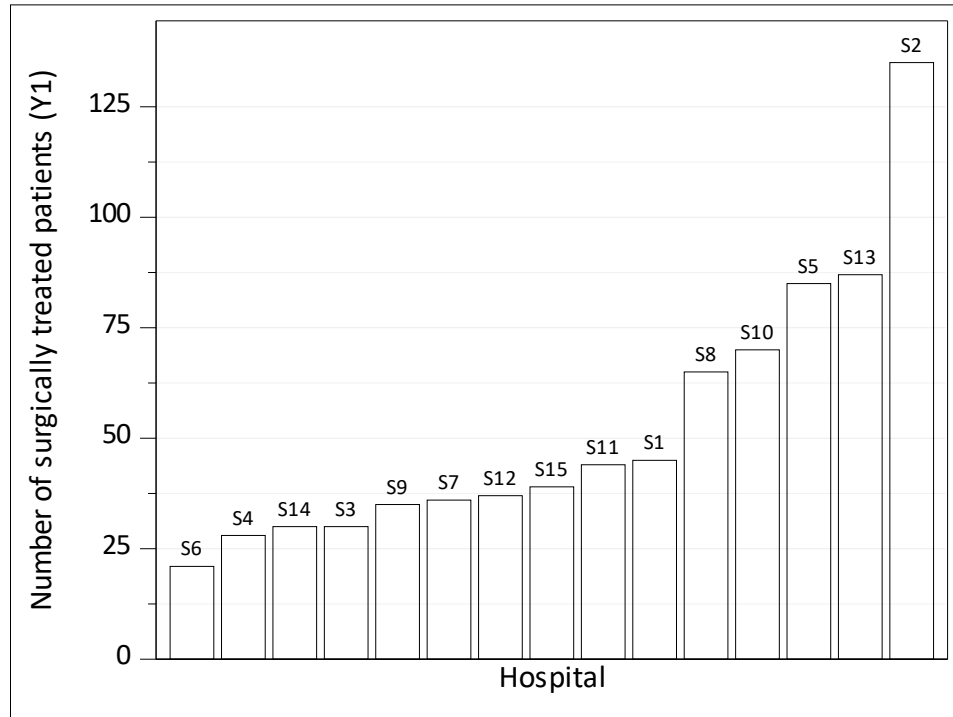
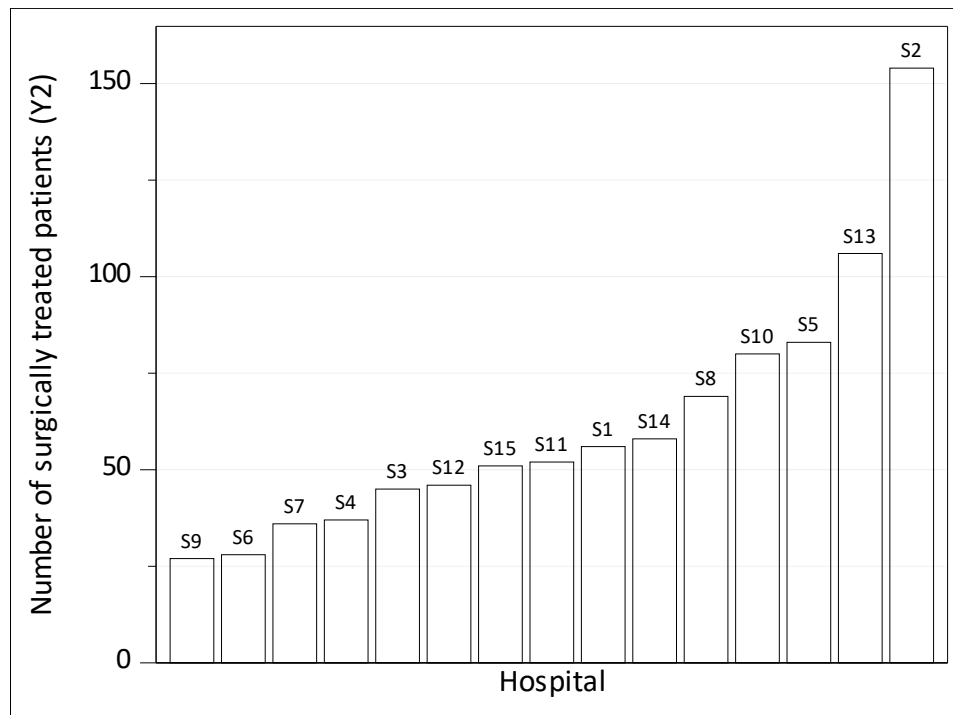


Figure 2: Absolute number of patients discussed on a MC that were treated surgically in the three convention years, by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

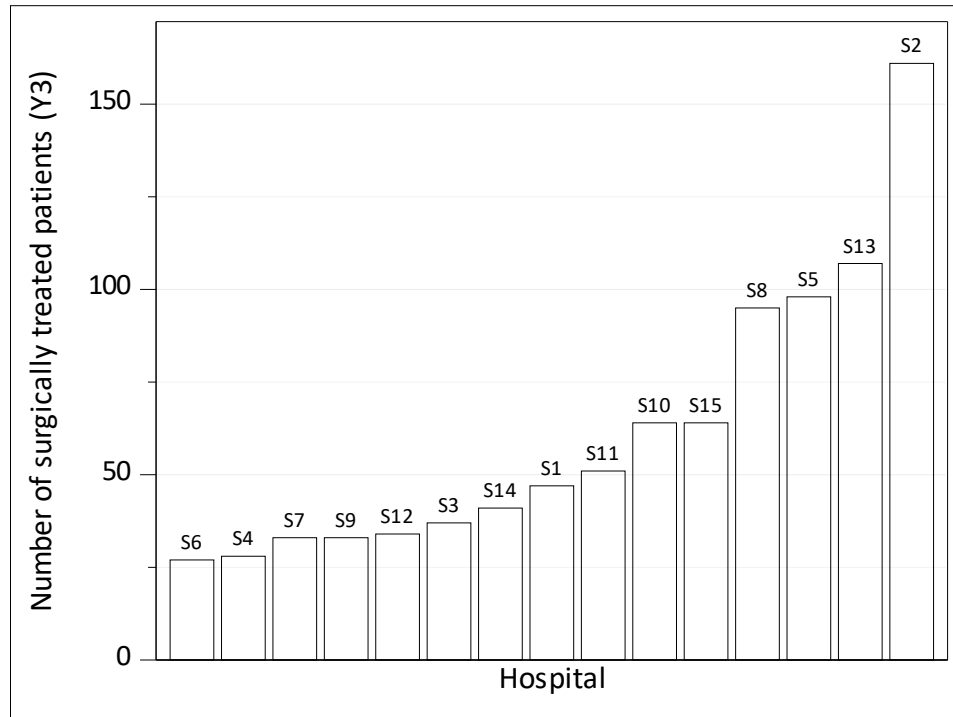
(a)



(b)



(c)



(d)

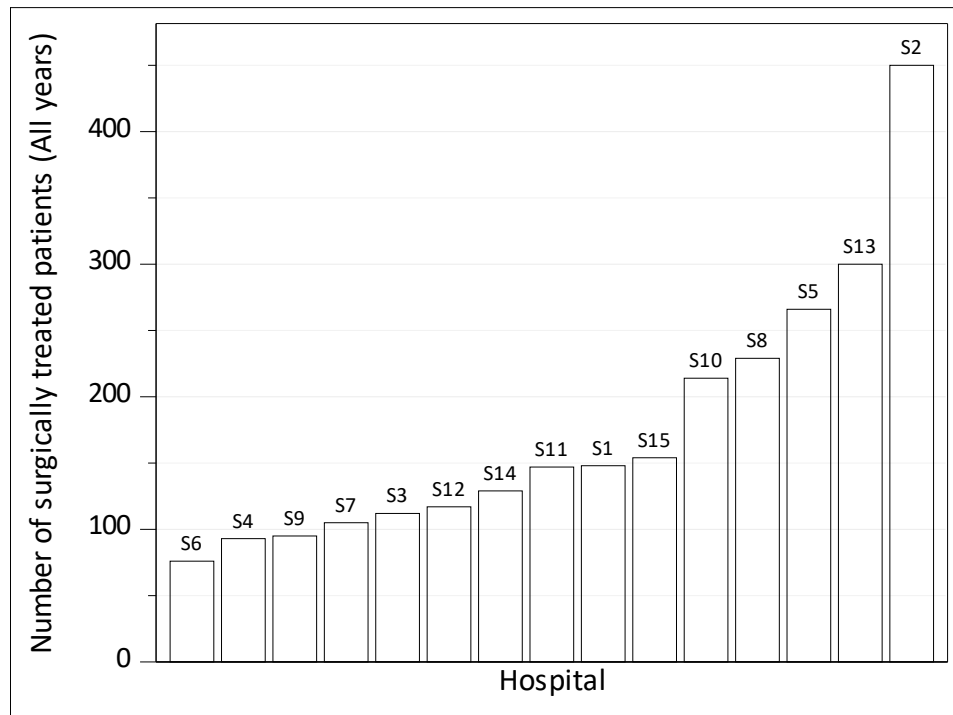
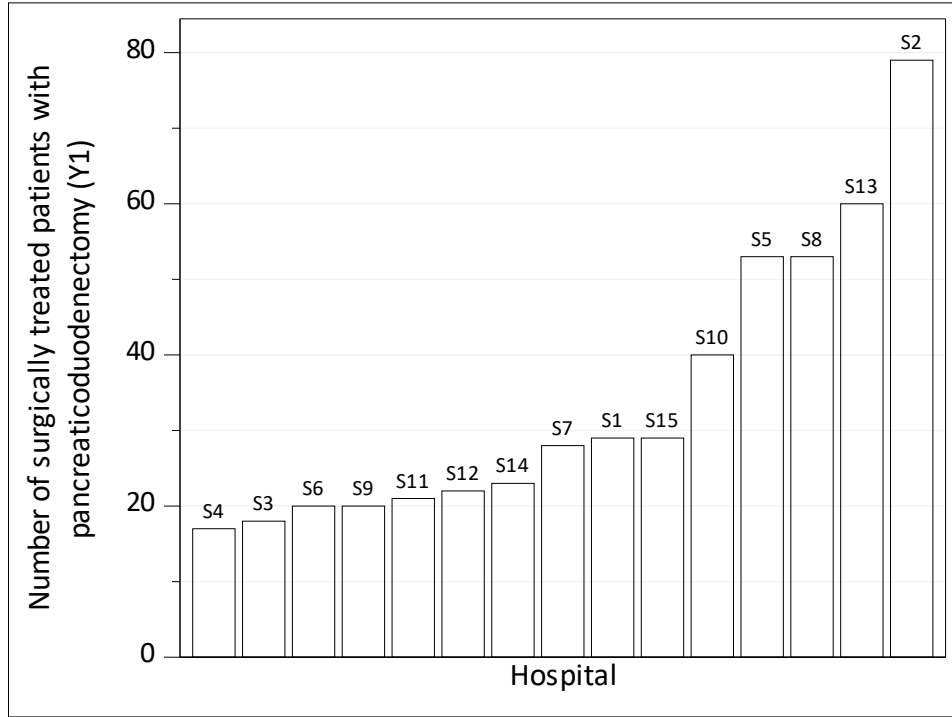
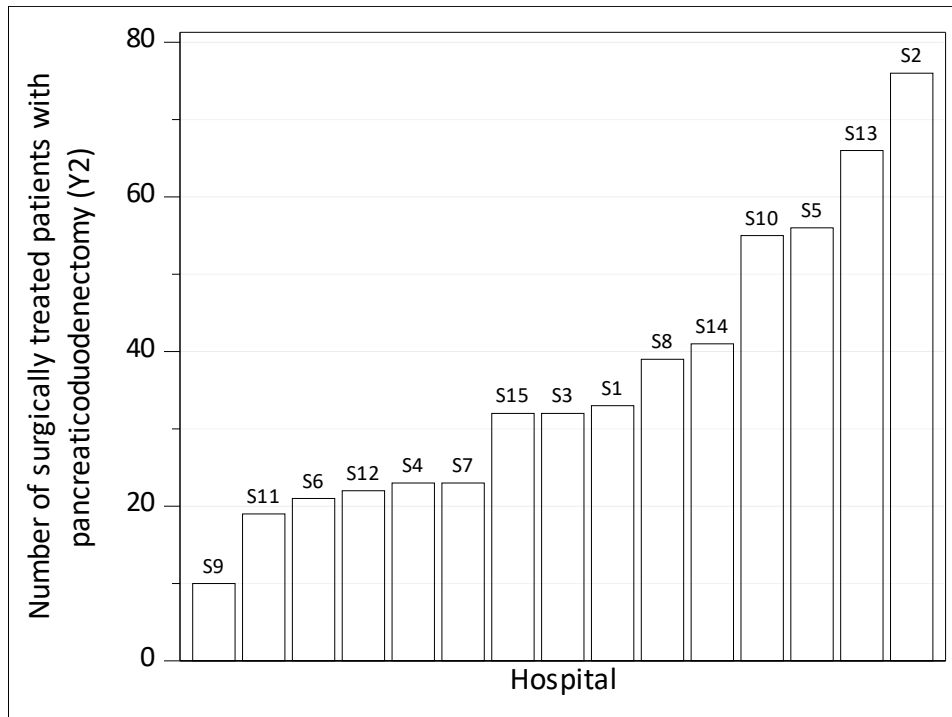


Figure 3: Absolute number of patients discussed on a MC that were treated with pancreaticoduodenectomy in the three convention years, by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

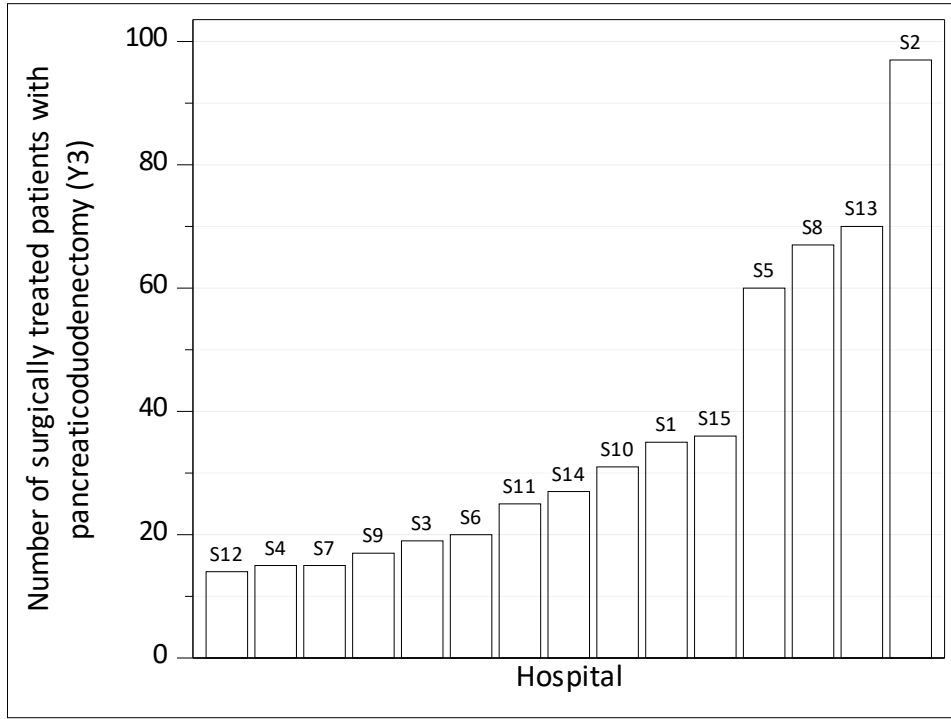
(a)



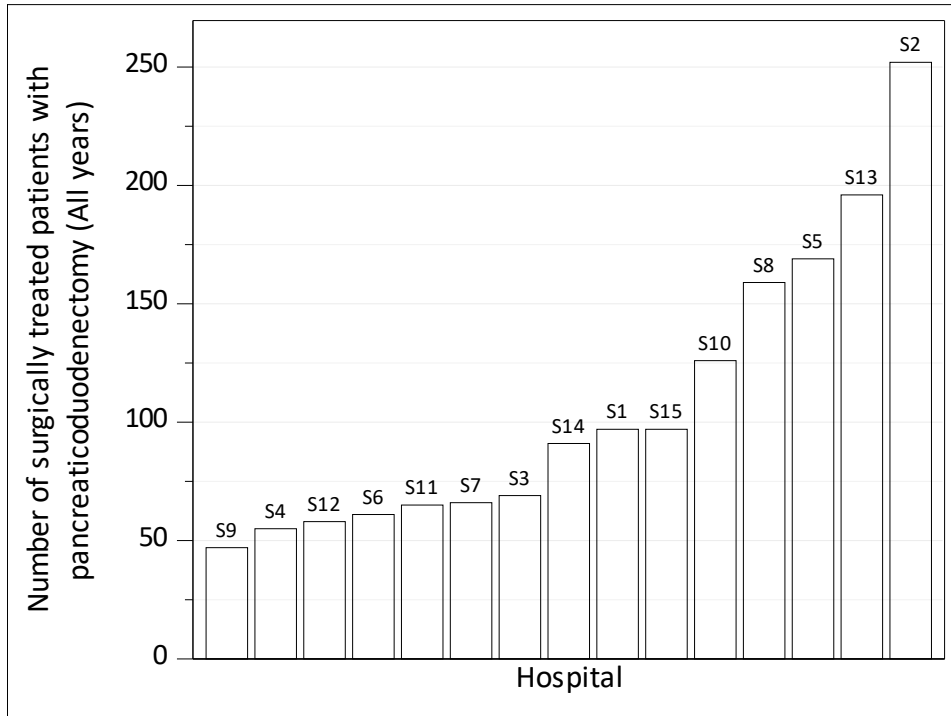
(b)



(c)



(d)



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 who underwent surgical treatment.

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>N patients with surgery</i>	598		721		739	
Number of patients entered in prospective clinical trial	13	2.2	29	4.0	43	5.8
<i>Expert centres</i>						
S1	34	5.7	42	5.8	39	5.3
S2	94	15.7	111	15.4	121	16.4
S3	23	3.8	42	5.8	33	4.5
S4	22	3.7	35	4.9	24	3.2
S5	68	11.4	69	9.6	78	10.6
S6	16	2.7	24	3.3	26	3.5
S7	29	4.8	22	3.1	25	3.4
S8	52	8.7	58	8.0	82	11.1
S9	27	4.5	20	2.8	22	3.0
S10	56	9.4	56	7.8	55	7.4
S11	31	5.2	35	4.9	35	4.7
S12	31	5.2	34	4.7	30	4.1
S13	59	9.9	85	11.8	77	10.4
S14	26	4.3	51	7.1	36	4.9
S15	30	5.0	37	5.1	56	7.6
<i>Sex</i>						
Male	324	54.2	385	53.4	406	54.9
Female	274	45.8	336	46.6	333	45.1
<i>Age at surgery</i>						
<=69	348	58.2	403	55.9	404	54.7
70-79	190	31.8	259	35.9	260	35.2
>=80	60	10.0	59	8.2	75	10.1
<i>Lesion to treat (in (peri-)pancreas)</i>						
Primary tumour	581	97.2	687	95.3	722	97.7
Relapse of primary tumour	12	2.0	18	2.5	9	1.2

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
Metastasis	5	0.8	16	2.2	8	1.1
Malignant morphology						
Adenocarcinoma	476	79.6	558	77.4	556	75.2
Neuroendocrine tumour	67	11.2	113	15.7	122	16.5
Other or unspecified	55	9.2	50	6.9	61	8.3
Primary tumour localisation						
C17.0 Duodenum	36	6.0	21	2.9	39	5.3
C24.0 Extrahepatic bile duct	44	7.4	51	7.1	44	6.0
C24.1 (Peri-) ampullary region	52	8.7	74	10.3	74	10.0
C25.0 Head of pancreas	290	48.5	307	42.6	329	44.5
C25.1 Body of pancreas	33	5.5	85	11.8	70	9.5
C25.2 Tail of pancreas	74	12.4	108	15.0	109	14.7
C25.3 Pancreatic duct	5	0.8	4	0.6	1	0.1
C25.4 Islands of Langerhans	0	0.0	4	0.6	23	3.1
C25.7-9 Other specified parts of pancreas	43	7.2	44	6.1	35	4.7
Other	21	3.5	23	3.2	15	2.0
Clinical stage						
0	9	1.6	2	0.3	19	2.6
I	270	47.1	321	46.1	348	48.5
II	139	24.3	225	32.3	197	27.4
III	60	10.5	60	8.6	80	11.1
IV	11	1.9	23	3.3	21	2.9
X	84	14.7	66	9.5	53	7.4
TNM not applicable or relapse*	25	_	24	_	21	_
Pathological stage						
0	12	2.5	17	2.9	35	6.0
I	112	23.7	162	27.7	157	26.8
II	156	33.1	201	34.4	205	35.0
III	156	33.1	162	27.7	165	28.2
IV	17	3.6	28	4.8	16	2.7
X	19	4.0	14	2.4	8	1.4
TNM not applicable or relapse*	20	_	19	_	18	_
Neoadjuvant treatment [†]	106	_	118	_	135	_
yPathological stage						
0	3	3.0	4	3.5	5	3.8
I	41	40.6	28	24.8	43	32.6
II	29	28.7	45	39.8	46	34.8
III	25	24.8	28	24.8	30	22.7
IV	2	2.0	8	7.1	8	6.1

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
X	1	1.0	0	0.0	0	0.0
TNM not applicable or relapse*	5	_	5	_	3	_
No neoadjuvant treatment	492	_	603	_	604	_
Type of first diagnostic method						
CT	359	60.0	438	60.7	442	59.8
ERCP	19	3.2	25	3.5	26	3.5
EUS	99	16.6	98	13.6	97	13.1
MRI	98	16.4	122	16.9	145	19.6
PET	1	0.2	6	0.8	5	0.7
PET/CT	18	3.0	27	3.7	22	3.0
Surgery	4	0.7	5	0.7	2	0.3
Method to obtain first tissue sample for APO						
CT	5	0.8	7	1.0	3	0.4
ERCP	66	11.1	81	11.2	65	8.8
EUS	336	56.3	359	49.8	390	52.8
MRI	6	1.0	4	0.6	5	0.7
Surgery	184	30.8	270	37.4	276	37.3
Missing	1	0.0	0	0.0	0	0.0
Prior surgery or other treatment **						
Prior abdominal surgery	59	9.9	137	19.0	119	16.1
Other treatment modality (that could affect the pancreas)	66	11.0	101	14.0	109	14.7
Neoadjuvant treatment						
Chemotherapy	89	14.9	107	14.8	120	16.2
Radiotherapy	0	0.0	1	0.1	1	0.1
Chemoradiotherapy	17	2.8	10	1.4	14	1.9
No chemo or radiation treatment	492	82.3	603	83.6	604	81.7
Charlson Comorbidity Index						
0	263	44.0	272	37.7	304	41.1
1	129	21.6	162	22.5	189	25.6
2	88	14.7	121	16.8	139	18.8
3	46	7.7	72	10.0	53	7.2
4	26	4.3	43	6.0	26	3.5
5	14	2.3	19	2.6	11	1.5
6	14	2.3	14	1.9	9	1.2
7	9	1.5	9	1.2	2	0.3
8	5	0.8	4	0.6	3	0.4
9	3	0.5	2	0.3	2	0.3
10	1	0.2	2	0.3	1	0.1
12	0	0.0	1	0.1	0	0.0

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
WHO score at surgery						
0 - Asymptomatic, normal activity	188	31.4	176	24.4	195	26.4
1 - Symptomatic, but ambulant	347	58.0	462	64.1	447	60.5
2 - Symptomatic, bedbound < 50% day	53	8.9	70	9.7	82	11.1
3 - Symptomatic, bedbound > 50% day	9	1.5	12	1.7	15	2.0
4 - Completely dependent, 100% bedbound	1	0.2	1	0.1	0	0.0
ASA score						
1 - Healthy person	65	10.9	41	5.7	47	6.4
2 - Mild systemic disease, normal activity	329	55.0	395	54.8	377	51.0
3 - Serious systemic disease, limited activity	202	33.8	275	38.1	302	40.9
4 - Life-threatening illness, handicapped	2	0.3	10	1.4	13	1.8
Type of surgery						
Minimally invasive surgery (MIS) – Laparoscopic	134	22.4	195	27.0	221	29.9
Minimally invasive surgery (MIS) - Hybrid	1	0.2	0	0.0	1	0.1
Minimally invasive surgery (MIS) - Robotic	11	1.8	58	8.0	66	8.9
Open	431	72.1	432	59.9	408	55.2
Conversion from MIS to open surgery	21	3.5	36	5.0	43	5.8
Resectability status **						
Before neoadjuvant treatment						
- Upfront resectable	_	_	10	15.4	33	24.1
- Borderline resectable	_	_	41	63.1	75	54.7
- Unresectable	_	_	14	21.5	27	19.7
- No neoadjuvant treatment	_	_	342	_	604	_
Before surgery						
- Upfront resectable	_	_	347	85.3	640	86.6
- Borderline resectable	_	_	53	13.0	93	12.6
- Unresectable	_	_	1	0.2	5	0.7
- Missing	_	_	6	1.5	1	0.1
Simultaneous venous resection						
No	484	80.9	635	88.1	640	86.6
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	114	19.1	86	11.9	99	13.4
- With primary wedge-reconstruction	36	_	24	_	27	_
- With primary end-to-end reconstruction	42	_	47	_	55	_
- With vascular autograft interposition	1	_	3	_	3	_
- With vascular allograft interposition	9	_	3	_	8	_
- With synthetic/prosthetic interposition	3	_	1	_	2	_
- With peritoneal patch wedge-reconstruction	19	_	8	_	4	_
- Without reconstruction	4	_	0	_	0	_

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>Simultaneous arterial resection **</i>						
No	580	97.0	711	98.6	722	97.7
Hepatic artery resection	5	0.8	7	1.0	6	0.8
- With primary wedge-reconstruction	0	–	0	–	0	–
- With primary end-to-end reconstruction	4	–	4	–	4	–
- With vascular autograft interposition	0	–	0	–	0	–
- With vascular allograft interposition	1	–	0	–	0	–
- With synthetic/prosthetic interposition	0	–	0	–	0	–
- Without reconstruction	0	–	3	–	2	–
Coeliac trunk resection	9	1.5	3	0.4	8	1.1
- With primary wedge-reconstruction	0	–	0	–	0	–
- With primary end-to-end reconstruction	0	–	0	–	1	–
- With vascular autograft interposition	0	–	0	–	0	–
- With vascular allograft interposition	0	–	0	–	0	–
- With synthetic/prosthetic interposition	0	–	0	–	0	–
- Without reconstruction	9	–	3	–	7	–
Superior mesenteric artery (SMA) resection	4	0.7	0	0.0	2	0.3
- With primary wedge-reconstruction	1	–	0	–	0	–
- With primary end-to-end reconstruction	1	–	0	–	0	–
- With vascular autograft interposition	0	–	0	–	2	–
- With vascular allograft interposition	0	–	0	–	0	–
- With synthetic/prosthetic interposition	0	–	0	–	0	–
- Without reconstruction	2	–	0	–	0	–
<i>Simultaneous other organ resection **</i>						
No	385	64.4	463	64.2	428	57.9
Colon	29	4.8	13	1.8	11	1.5
Stomach	53	8.9	112	15.5	152	20.6
Adrenal gland	14	2.3	14	1.9	17	2.3
Spleen	93	15.6	133	18.4	153	20.7
Other	88	14.7	34	4.7	27	3.7
<i>RIZIV code for complex surgery</i>						
242830-242841: Pancreaticoduodenectomy	459	76.8	499	69.2	513	69.4
Pancreaticoduodenectomy	422	91.9	462	92.6	474	92.4
Total Pancreatectomy	37	8.1	37	7.4	39	7.6
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
242874-242885: Hemipancreatectomy left	88	14.7	142	19.7	160	21.7
242896-242900: Enucleation of a pancreatic tumour	8	1.3	10	1.4	11	1.5

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>Antithrombotic medication</i>						
No	417	69.7	500	69.3	528	71.4
Yes	181	30.3	221	30.7	211	28.6
<i>Was the patient referred?</i>						
No	270	45.2	307	42.6	322	43.6
Yes	328	54.8	414	57.4	417	56.4

* 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.

‡ 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 who underwent surgical treatment.

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>N patients with surgery</i>	126		135		112	
<i>Expert centres</i>						
S1	5	4.0	8	5.9	5	4.5
S2	37	29.4	35	25.9	26	23.2
S3	4	3.2	2	1.5	4	3.6
S4	3	2.4	1	0.7	3	2.7
S5	10	7.9	5	3.7	9	8.0
S6	3	2.4	4	3.0	0	0.0
S7	6	4.8	11	8.1	7	6.3
S8	11	8.7	6	4.4	10	8.9
S9	5	4.0	4	3.0	8	7.1
S10	9	7.1	19	14.1	6	5.4
S11	6	4.8	11	8.1	9	8.0
S12	2	1.6	8	5.9	3	2.7
S13	18	14.3	11	8.1	13	11.6
S14	3	2.4	4	3.0	5	4.5
S15	4	3.2	6	4.4	4	3.6
<i>Sex</i>						
Male	67	53.2	70	51.9	48	42.9
Female	59	46.8	65	48.1	64	57.1
<i>Age at surgery</i>						
<=69	81	64.3	82	60.7	75	67.0
70-79	42	33.3	46	34.1	31	27.7
>=80	3	2.4	7	5.2	6	5.4
<i>Benign Tumoural Morphology</i>						
Adenoma	11	8.7	4	3.0	9	8.0
Cystadenoma	26	20.6	31	23.0	31	27.7
IPMN	67	53.2	78	57.8	61	54.5
Other benign	22	17.5	22	16.3	11	9.8
<i>Prior surgery or other treatment **</i>						
Prior abdominal surgery	9	7.1	15	11.1	18	16.1
Other treatment modality (that could affect the pancreas)	1	0.8	2	1.5	3	2.7
<i>Charlson Comorbidity Index</i>						
0	58	46.0	63	46.7	46	41.1
1	33	26.2	36	26.7	22	19.6

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
2	16	12.7	19	14.1	19	17.0
3	9	7.1	9	6.7	13	11.6
4	5	4.0	5	3.7	7	6.3
5	3	2.4	2	1.5	0	0.0
6	2	1.6	1	0.7	2	1.8
7	0	0.0	0	0.0	1	0.9
9	0	0.0	0	0.0	1	0.9
11	0	0.0	0	0.0	1	0.9
WHO score at surgery						
0 - Asymptomatic, normal activity	66	52.4	61	45.2	58	51.8
1 - Symptomatic, but ambulant	55	43.7	64	47.4	46	41.1
2 - Symptomatic, bedbound < 50% day	5	4.0	8	5.9	8	7.1
3 - Symptomatic, bedbound > 50% day	0	0.0	2	1.5	0	0.0
ASA score						
1 - Healthy person	15	11.9	21	15.6	12	10.7
2 - Mild systemic disease, normal activity	75	59.5	78	57.8	62	55.4
3 - Serious systemic disease, limited activity	35	27.8	35	25.9	38	33.9
4 - Life-threatening illness, handicapped	1	0.8	1	0.7	0	0.0
Type of surgery						
Minimally invasive surgery (MIS) – Laparoscopic	58	46.0	62	45.9	54	48.2
Minimally invasive surgery (MIS) - Hybrid	0	0.0	2	1.5	0	0.0
Minimally invasive surgery (MIS) - Robotic	7	5.6	12	8.9	20	17.9
Open	56	44.4	52	38.5	35	31.3
Conversion from MIS to open surgery	5	4.0	7	5.2	3	2.7
Simultaneous vascular resection						
No vascular reconstruction	125	99.2	132	97.8	111	99.1
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	1	0.8	3	2.2	1	0.9
Simultaneous other organ resection						
No	82	65.1	88	65.2	76	67.9
Colon	0	0.0	3	2.2	0	0.0
Stomach	3	2.4	7	5.2	6	5.4
Adrenal gland	1	0.8	0	0.0	1	0.9
Spleen	30	23.8	40	29.6	29	25.9
Other	16	12.7	4	3.0	2	1.8
RIZIV code for complex surgery						
242830-242841: Pancreaticoduodenectomy	67	53.2	62	45.9	46	41.1
Pancreaticoduodenectomy	56	83.6	51	82.3	39	84.8
Total Pancreatectomy	11	16.4	11	17.7	7	15.2

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
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
242874-242885: Hemipancreatectomy left	41	32.5	47	34.8	39	34.8
242896-242900: Enucleation of a pancreatic tumour	3	2.4	5	3.7	6	5.4
<i>Antithrombotic medication</i>						
No	95	75.4	98	72.6	79	70.5
Yes	31	24.6	37	27.4	33	29.5
<i>Was the patient referred?</i>						
No	66	52.4	71	52.6	62	55.4
Yes	60	47.6	64	47.4	50	44.6

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

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 third 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 third convention year.

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

	Belgium, recognised centres		
	n registered	N performed	n/N (%)
<i>Expert centres</i>			

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 third 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 third convention year, by surgery type and expert centre.

Patient group	Belgium		
	N registered	n complete	n/N (%)
<i>N patients discussed on a MC in Year 3</i>	2,065	2,052	99.4
<i>Surgery status</i>			
N patients with surgery	851	841	98.8
N patients without surgery	1,214	1,211	99.8
<i>Expert centres</i>			
S1	121	121	100.0
S2	301	300	99.7
S3	98	98	100.0
S4	71	71	100.0
S5	152	152	100.0
S6	98	98	100.0
S7	91	91	100.0
S8	211	211	100.0
S9	79	78	98.7
S10	152	152	100.0
S11	101	91	90.1
S12	84	84	100.0
S13	142	142	100.0
S14	140	140	100.0
S15	224	223	99.6

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 primary oncological treatment, which can be any neoadjuvant treatment or surgery.

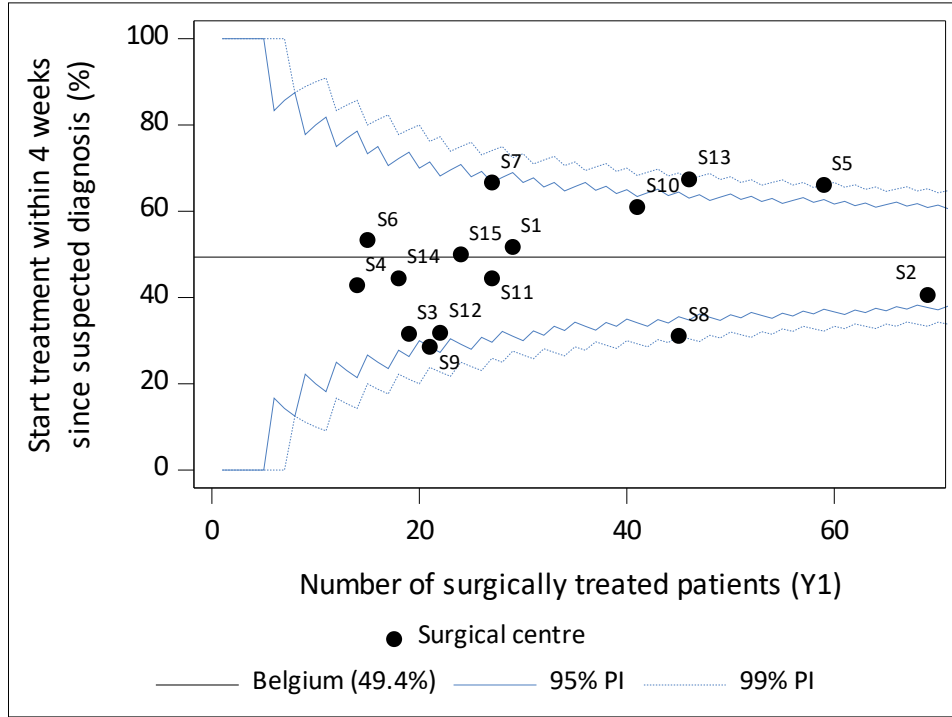
3.2.1.1. Time between suspected diagnosis and start of treatment for patients with (suspected) adenocarcinoma

Table 6. Proportion of surgically treated patients with **suspected adenocarcinoma** in the three convention years for whom treatment started within 4 weeks since suspected diagnosis.

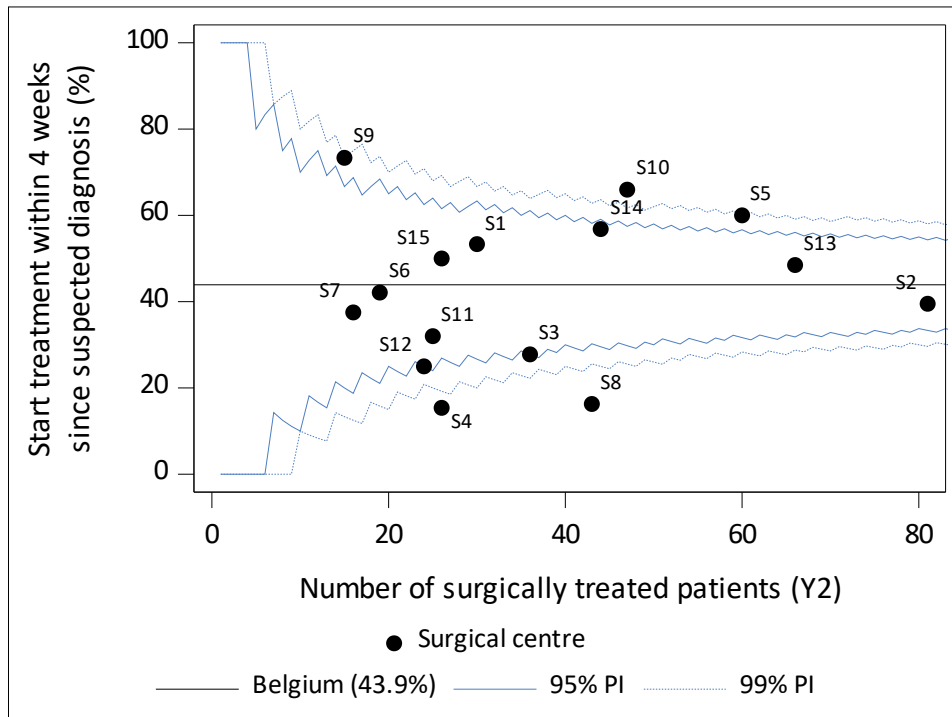
Patient group	Belgium			
	N	n	n/N (%)	95% CI
Total surgically treated patients with adenocarcinoma	1,590	716	45.0	[42.6, 47.5]
Convention Year				
Year 1	476	235	49.4	[44.8, 54.0]
Year 2	558	245	43.9	[39.7, 48.1]
Year 3	556	236	42.4	[38.3, 46.7]
Referral status				
Surgically treated patients referred to an expert centre	938	419	44.7	[41.5, 47.9]
Surgically treated patients without referral	652	297	45.6	[41.7, 49.5]

Figure 4: Funnel and spaghetti plot of the proportion of all surgically treated patients with suspected adenocarcinoma for whom treatment started within 4 weeks since suspected diagnosis, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

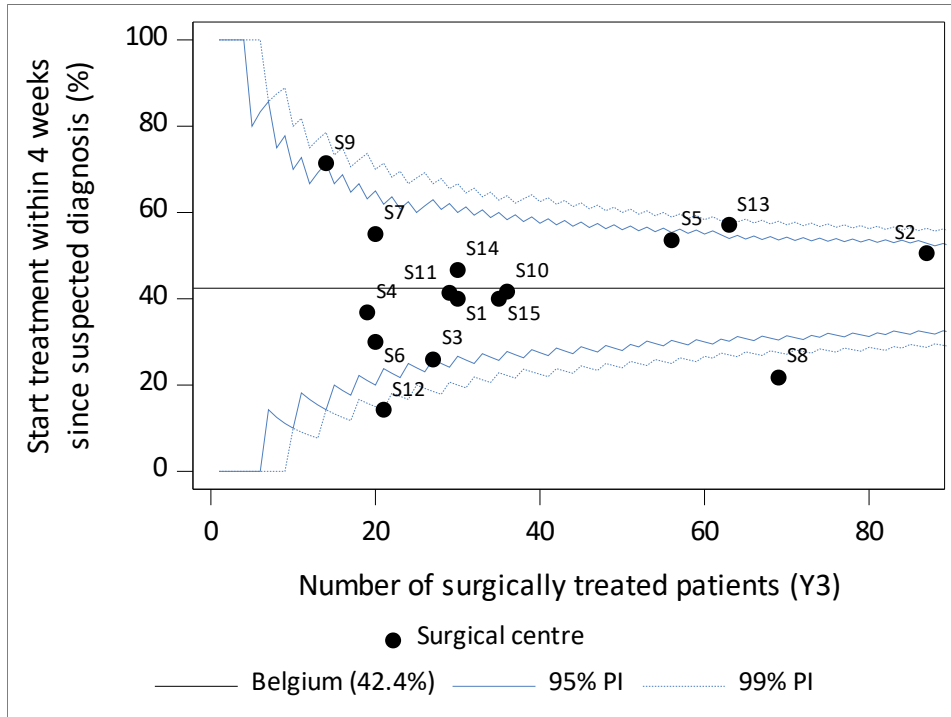
(a)



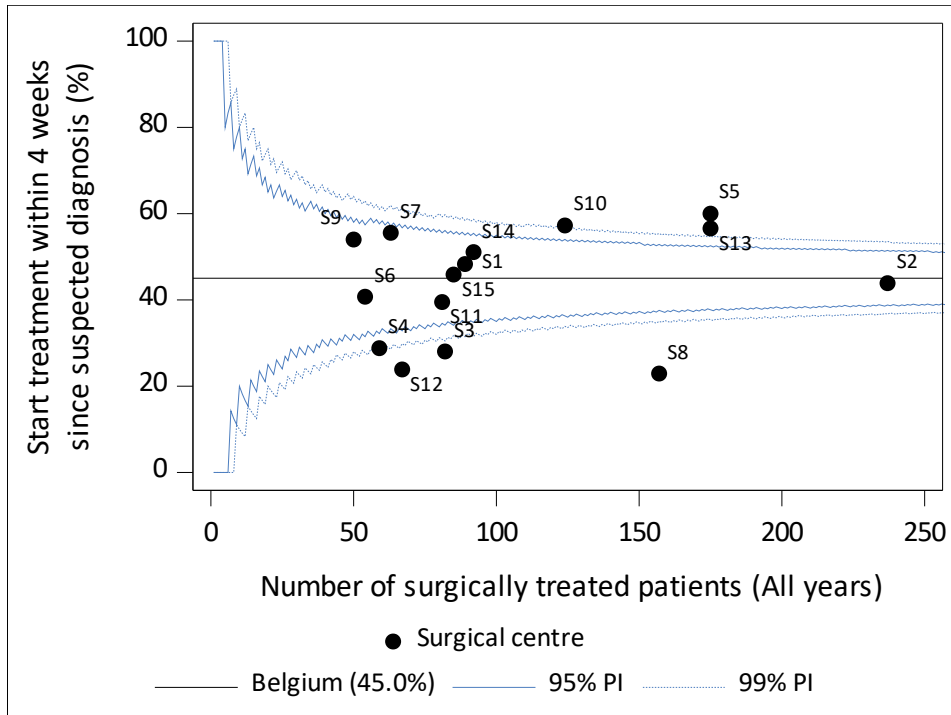
(b)



(c)



(d)



(e)

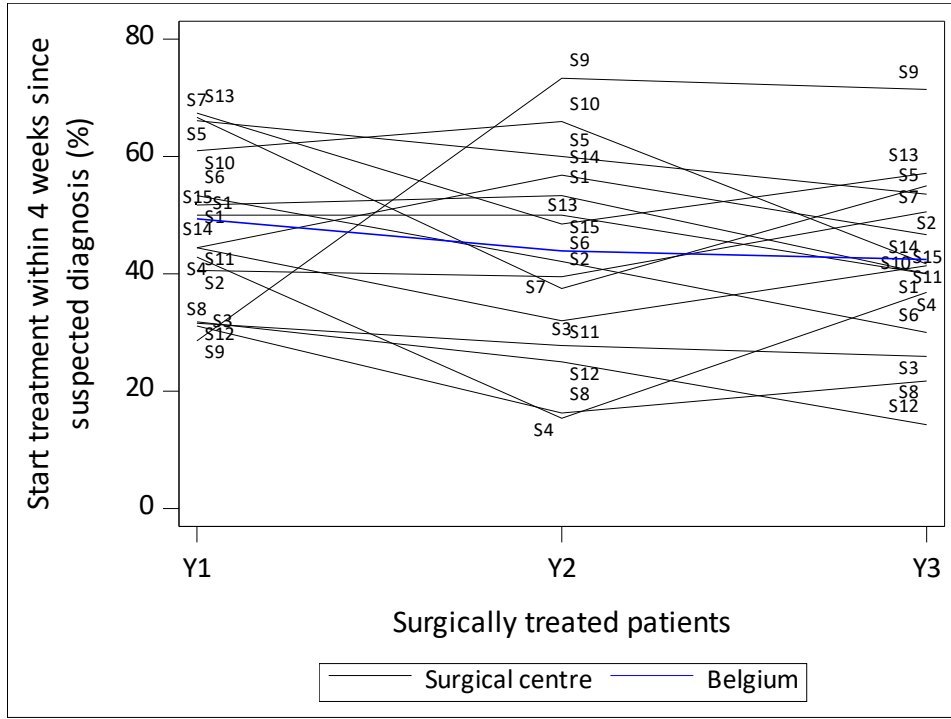
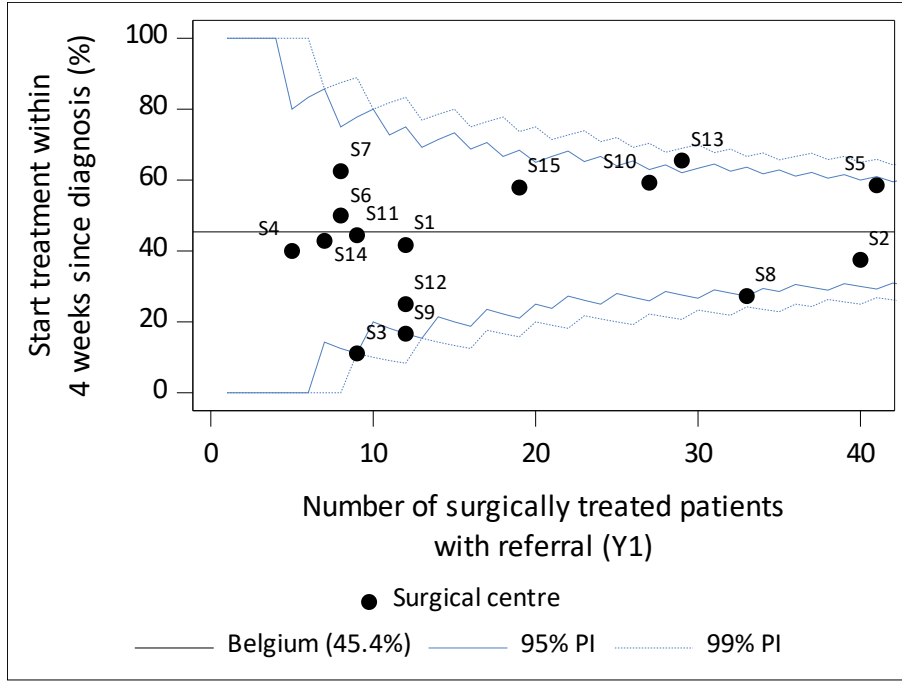
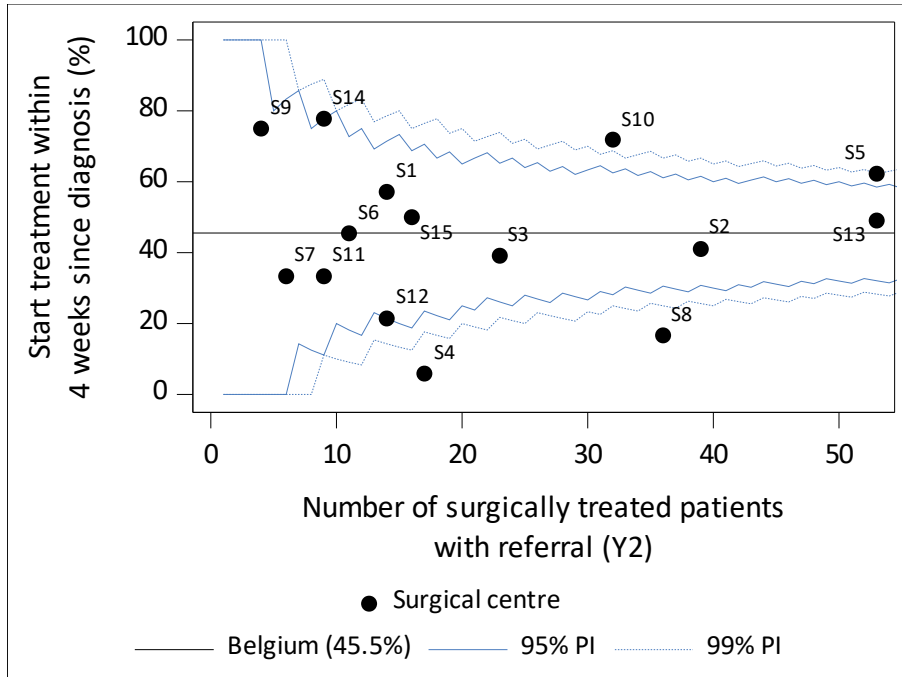


Figure 5: Funnel and spaghetti plot of the proportion of all surgically treated patients **referred to an expert centre** with suspected **adenocarcinoma** for whom treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined,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

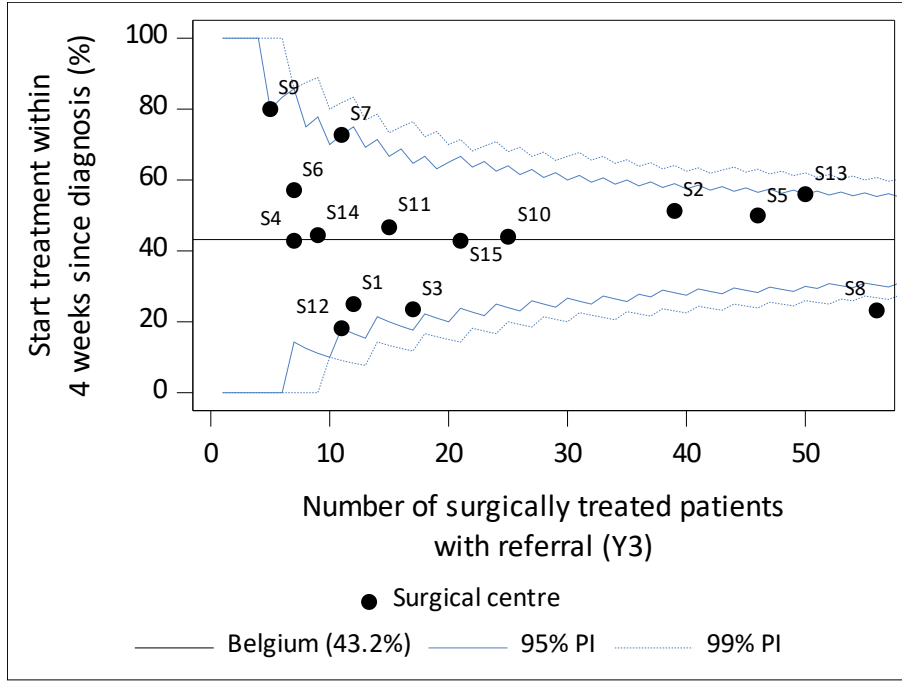
(a)



(b)



(c)



(d)

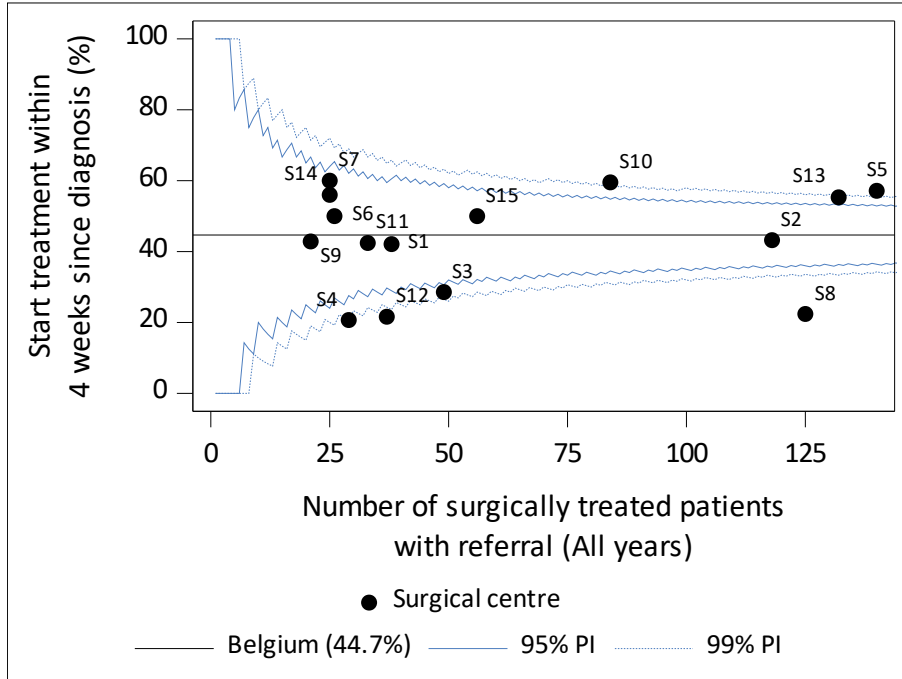
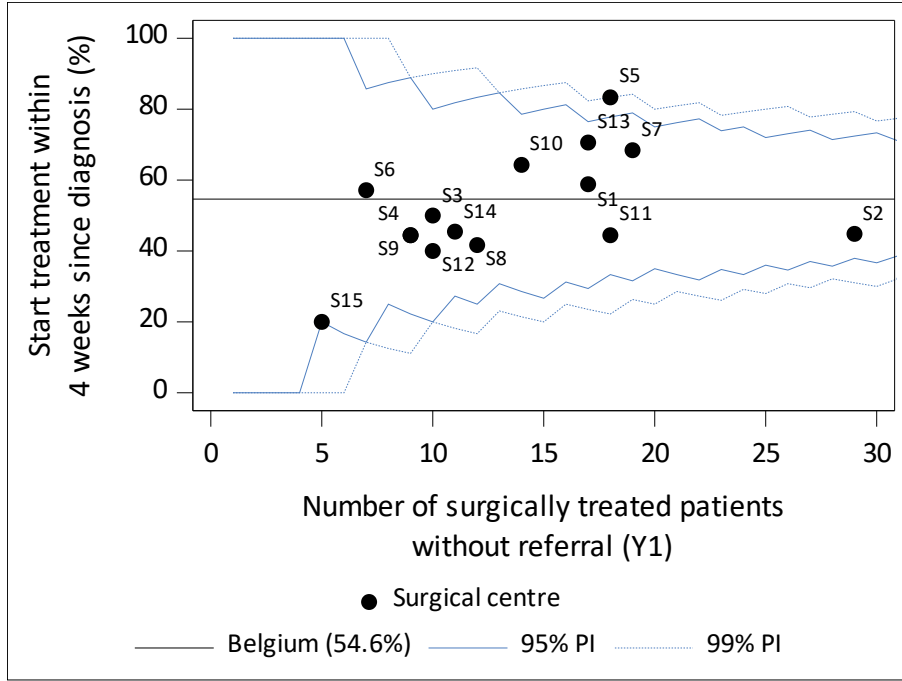
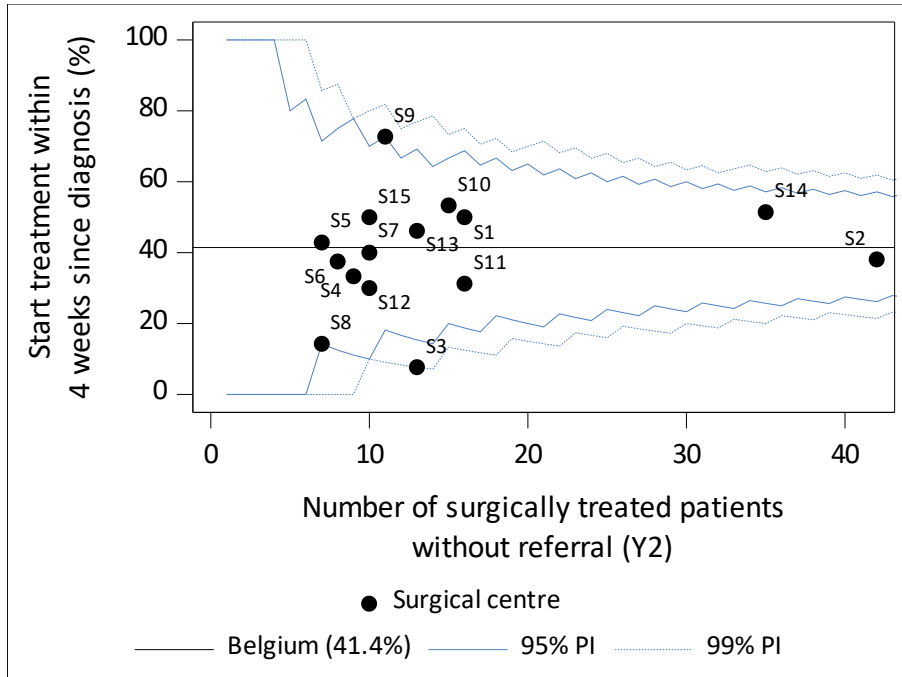


Figure 6: Funnel and spaghetti plot of the proportion of all surgically treated patients **without referral** (= direct presentation at expert centre) with suspected **adenocarcinoma** for whom treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) year 1, (b) year 2, (c)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

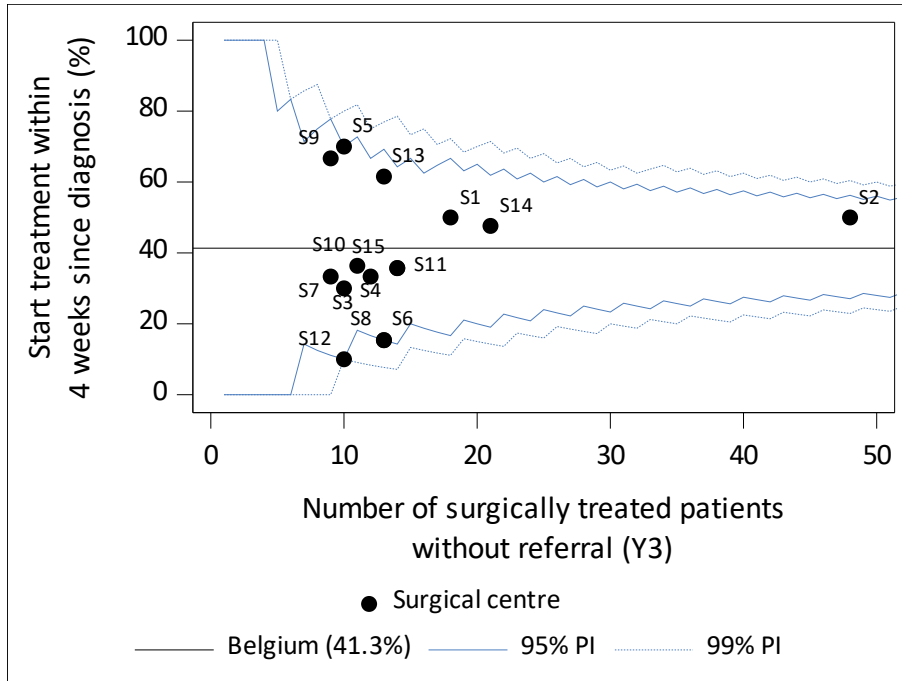
(a)



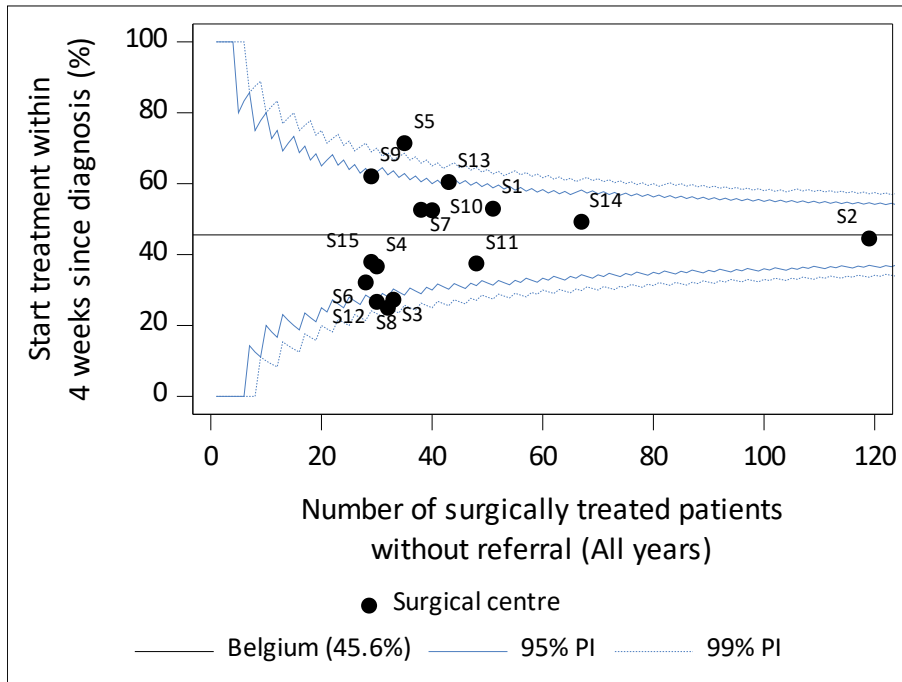
(b)



(c)



(d)



(e)

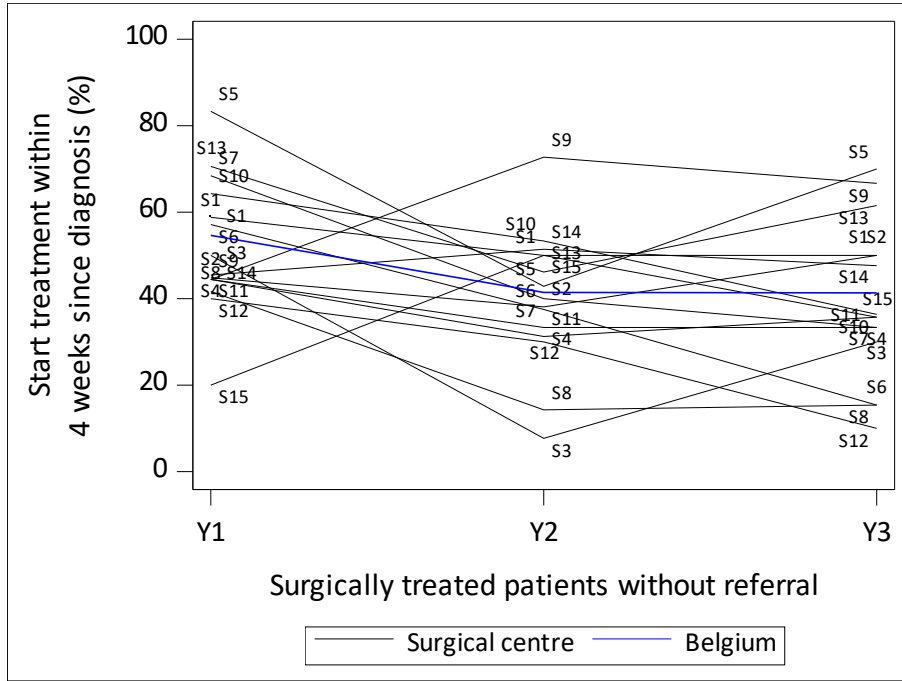
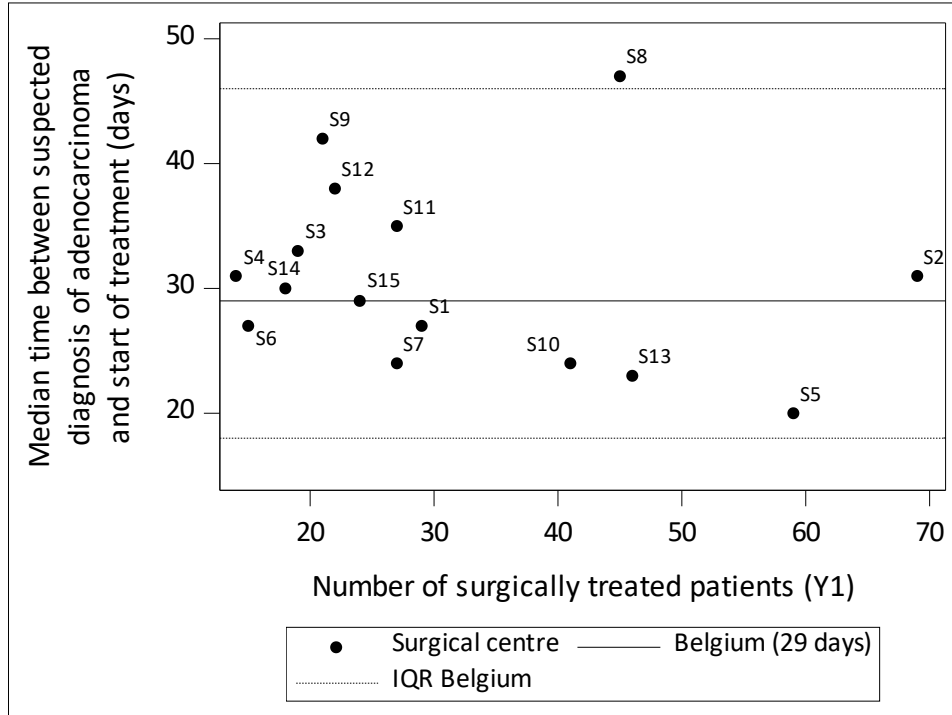


Table 7. Median time between **suspected** diagnosis of **adenocarcinoma** and start of treatment in the three convention years.

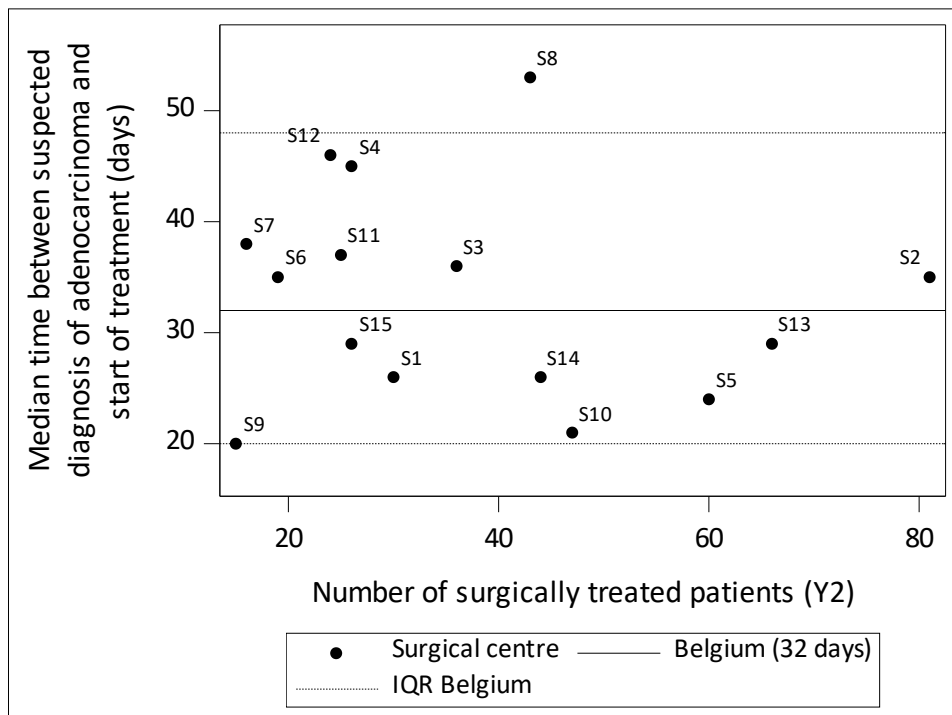
Belgium				
Patient group	N	Median (days)	IQR*	p90**
<i>Total surgically treated patients with adenocarcinoma</i>	1,590	31	[19, 49]	84
<i>Convention year</i>				
Year 1	476	29	[18, 46]	77
Year 2	558	32	[20, 48]	85
Year 3	556	33	[20, 54]	91
<i>Referral status</i>				
Surgically treated patients referred to an expert centre	938	31	[20, 49]	82
Surgically treated patients without referral	652	31	[19, 48]	90
* Interquartile Range= [the 25th, and 75th percentiles of the data]				
** 90th percentile				

Figure 7: Median time between **suspected** diagnosis of **adenocarcinoma** and start of treatment, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined.

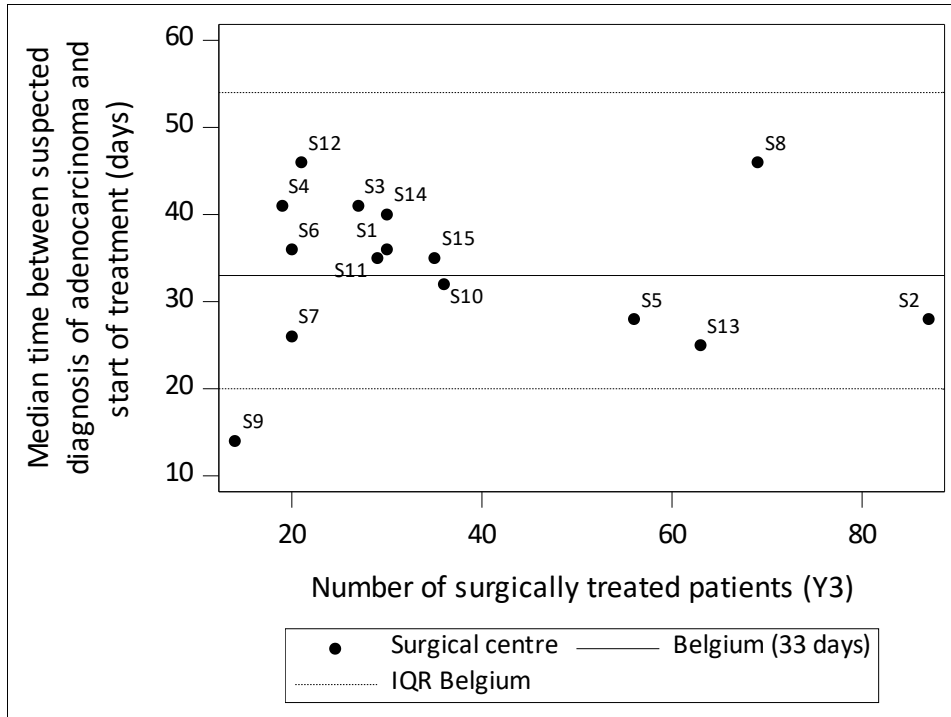
(a)



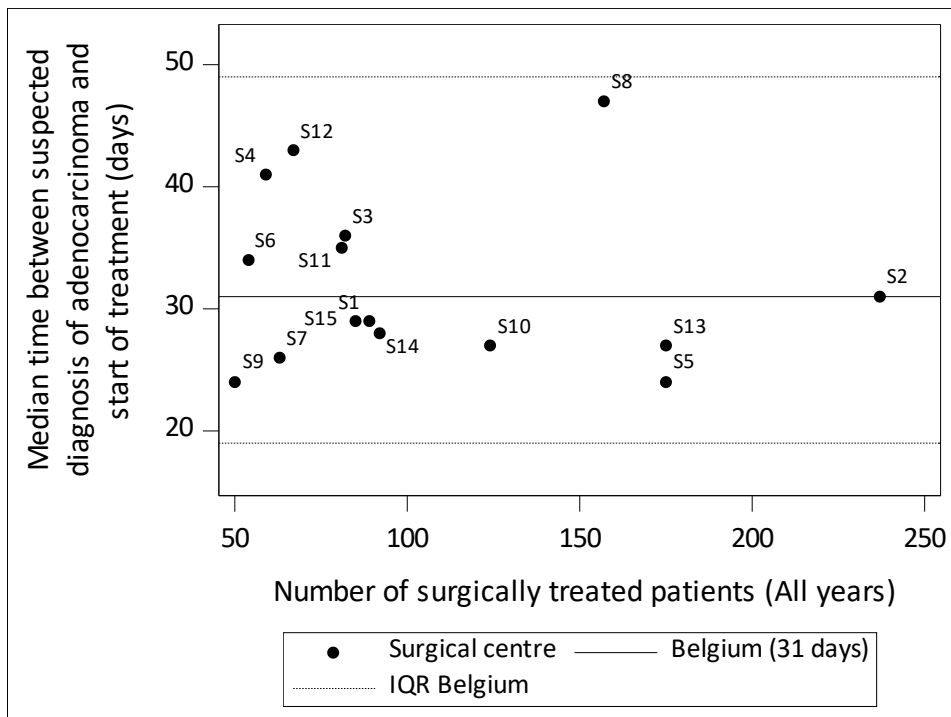
(b)



(c)



(d)



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

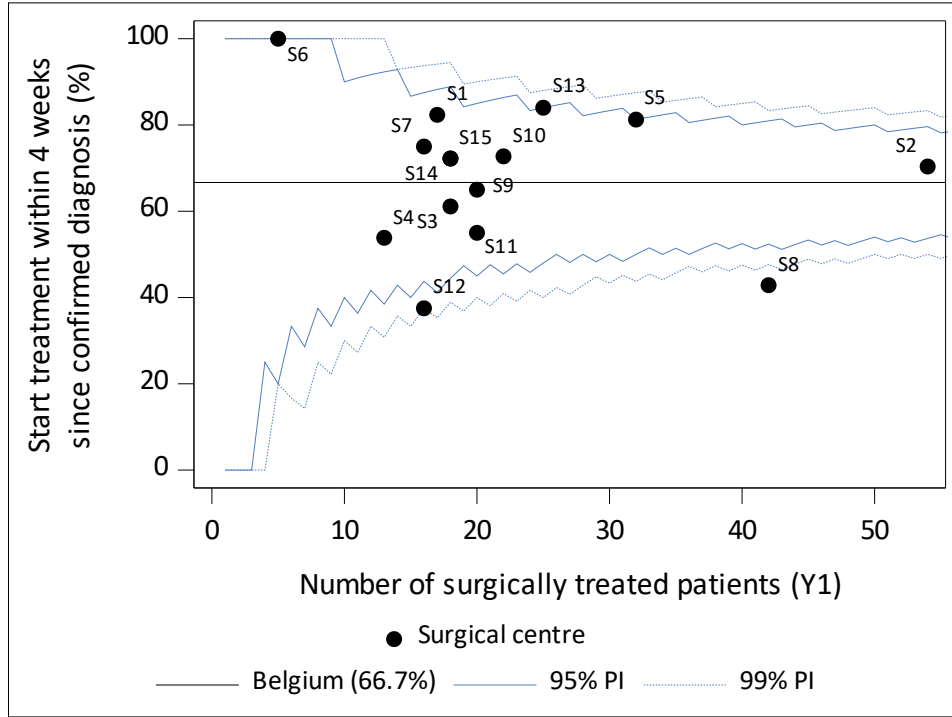
Table 8. Proportion of surgically treated patients with **adenocarcinoma** in the three convention years for whom treatment started within 4 weeks since **confirmed** diagnosis.

Patient group	N	Belgium		
		n	n/N (%)	95% CI
Total surgically treated patients with confirmed adenocarcinoma	1,073	635	59.2	[56.2, 62.1]
Convention year				
Year 1	336	224	66.7	[61.3, 71.7]
Year 2	367	220	59.9	[54.7, 65.0]
Year 3	370	191	51.6	[46.4, 56.8]
Referral status				
Surgically treated patients referred to an expert centre	641	368	57.4	[53.5, 61.3]
Surgically treated patients without referral	432	267	61.8	[57.0, 66.4]

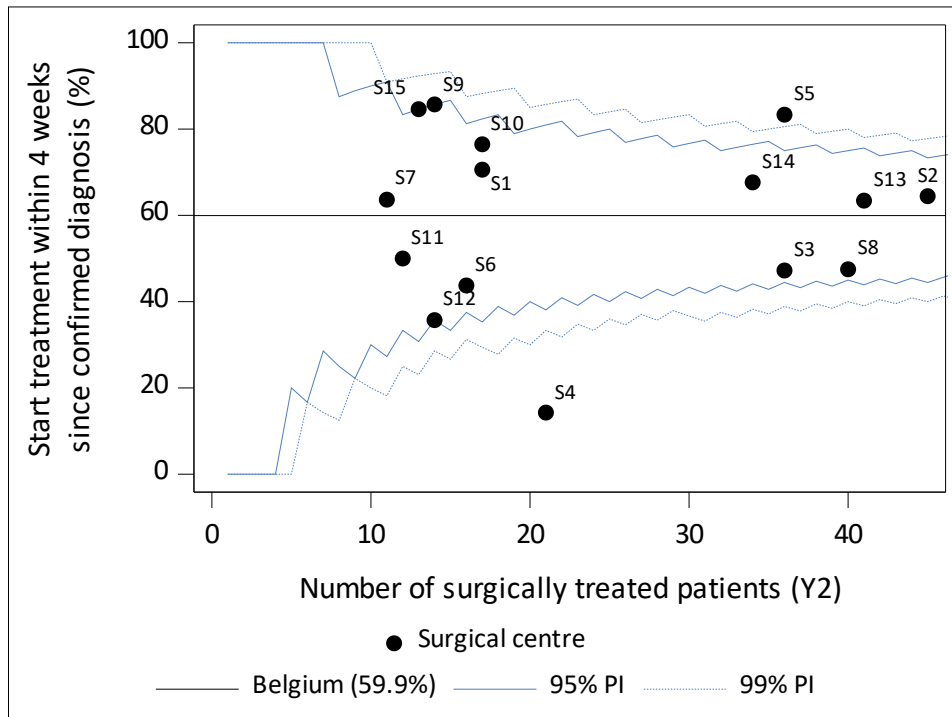
Remark: only surgically patients with a histologically confirmed diagnosis are shown in this table.

Figure 8: Funnel and spaghetti plot of the proportion of surgically treated patients with adenocarcinoma for whom treatment started within 4 weeks since confirmed diagnosis, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

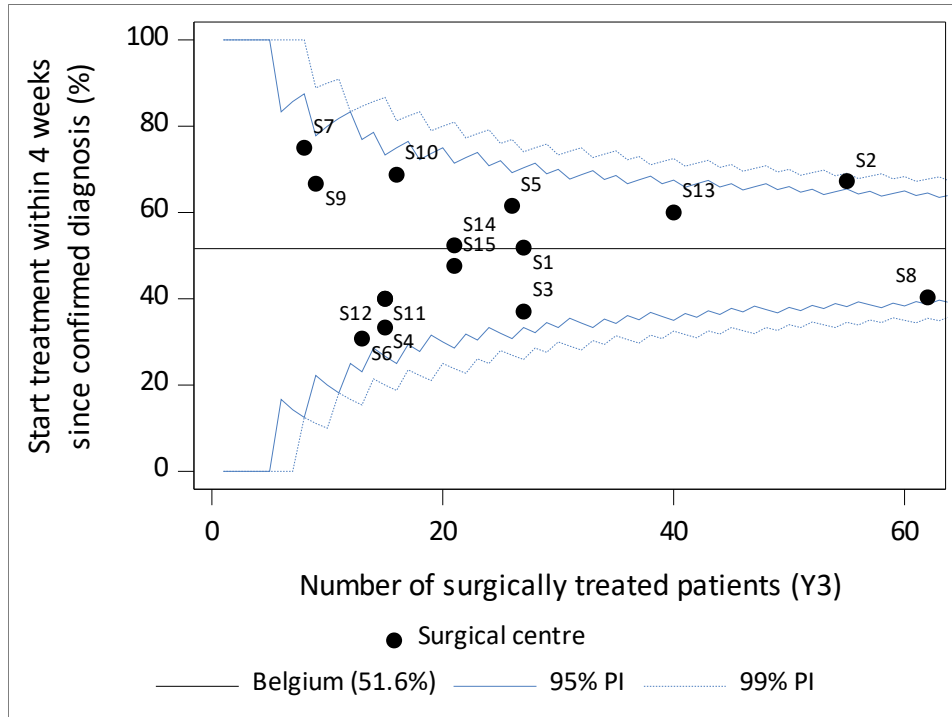
(a)



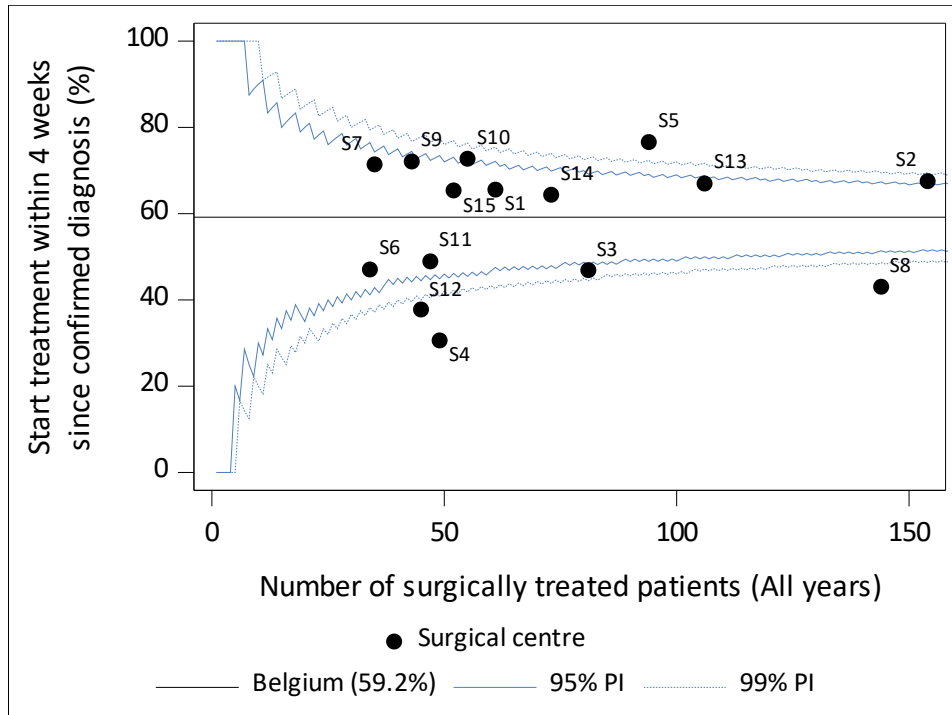
(b)



(c)



(d)



(e)

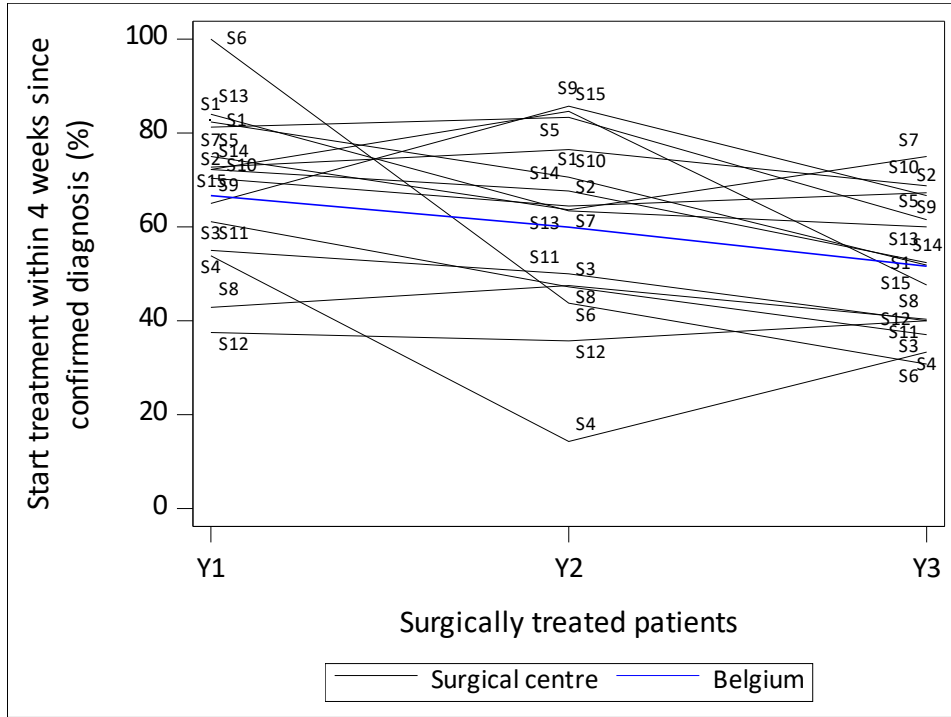
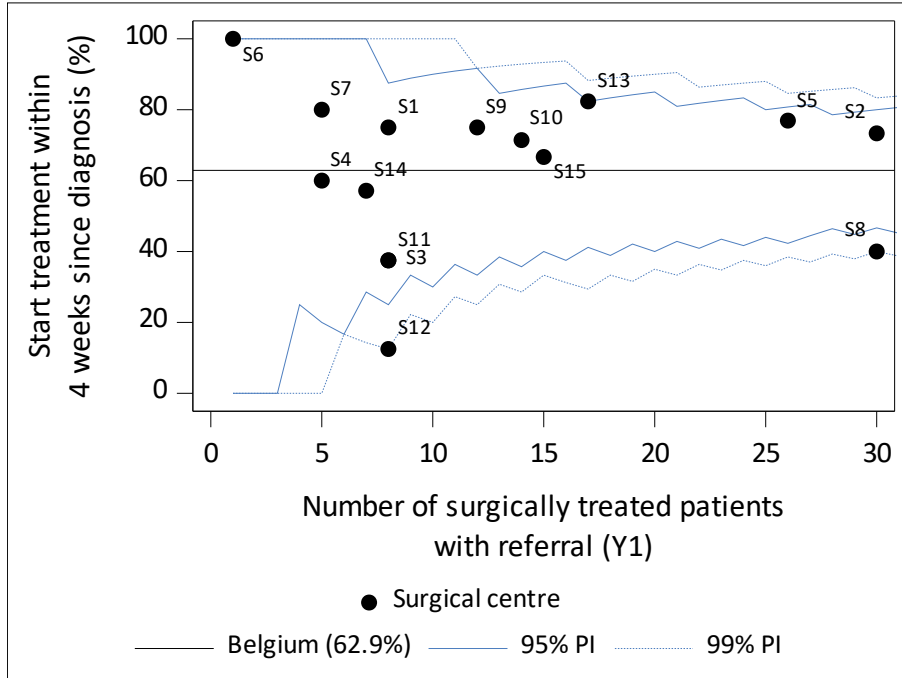
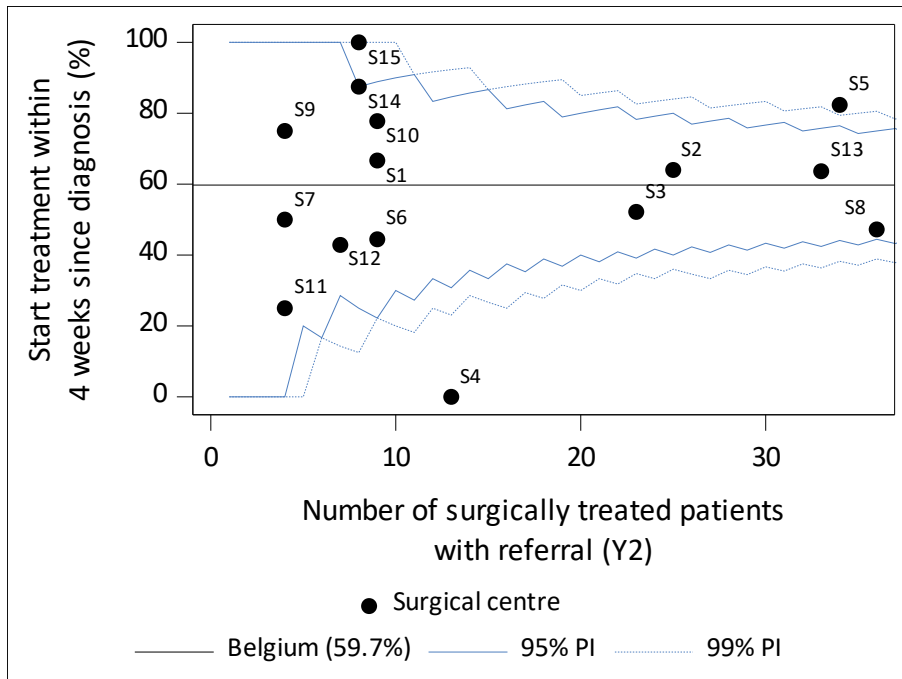


Figure 9: Funnel and spaghetti plot of the proportion of surgically treated patients referred to an expert centre with adenocarcinoma for whom treatment started within 4 weeks since confirmed diagnosis, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

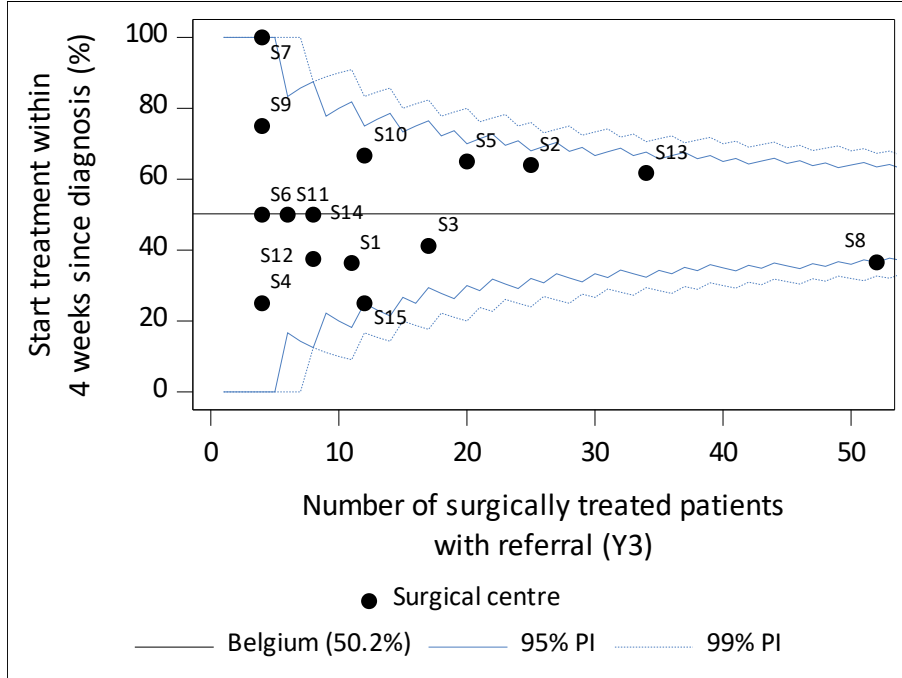
(a)



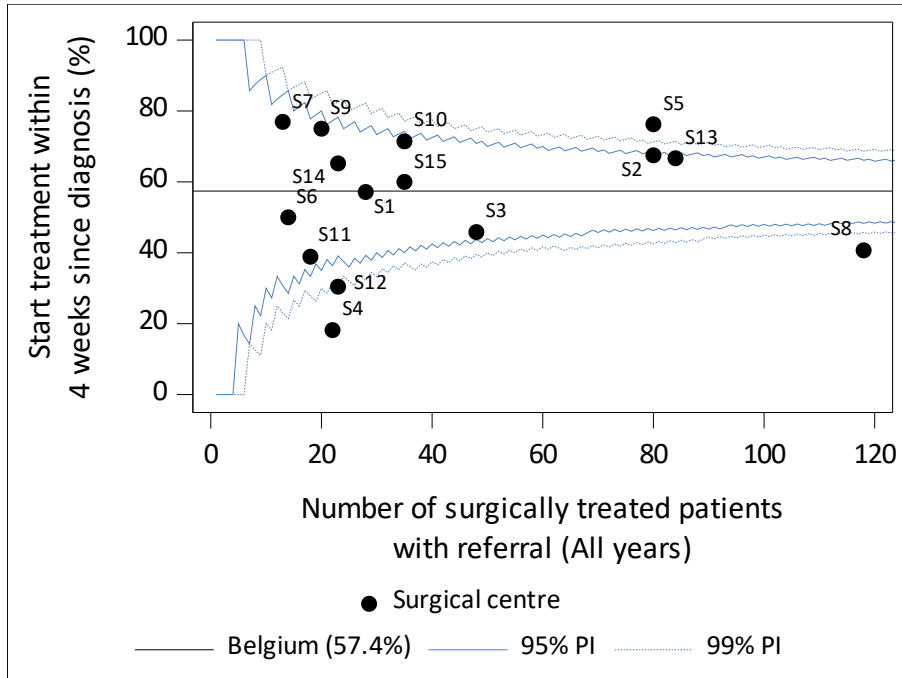
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(c)



(d)



(e)

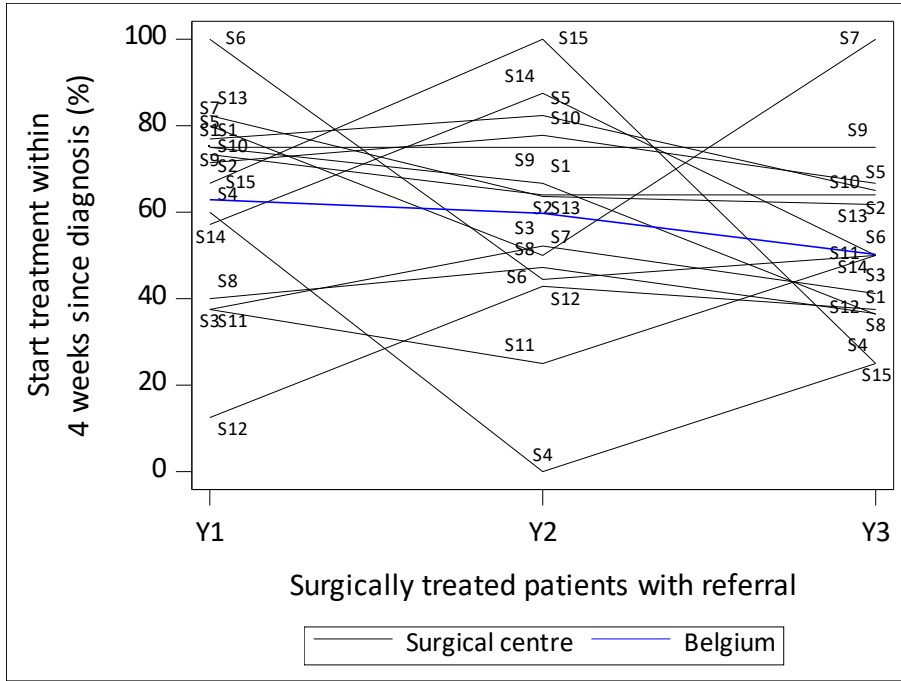
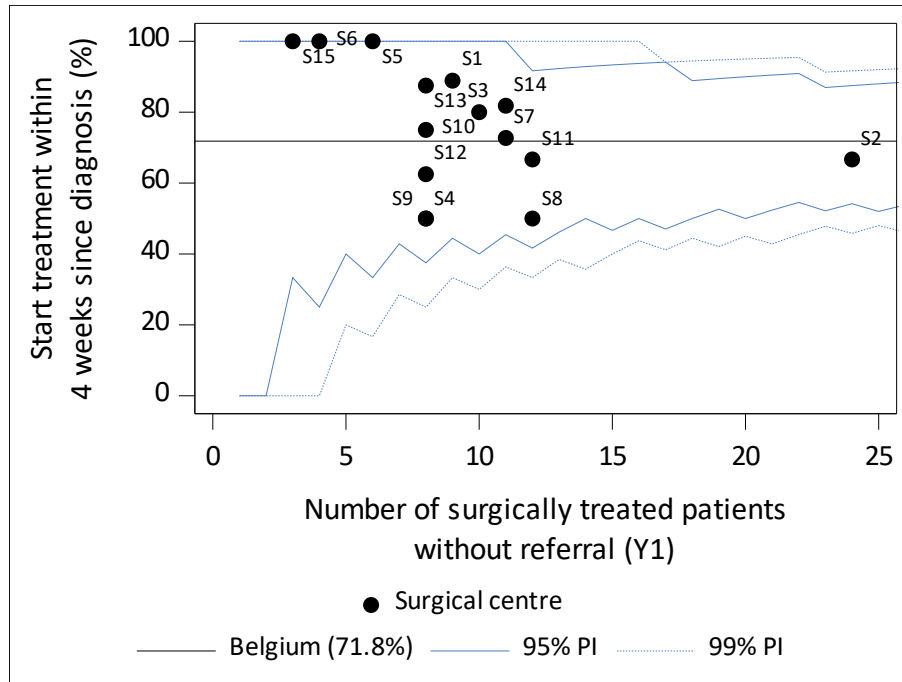
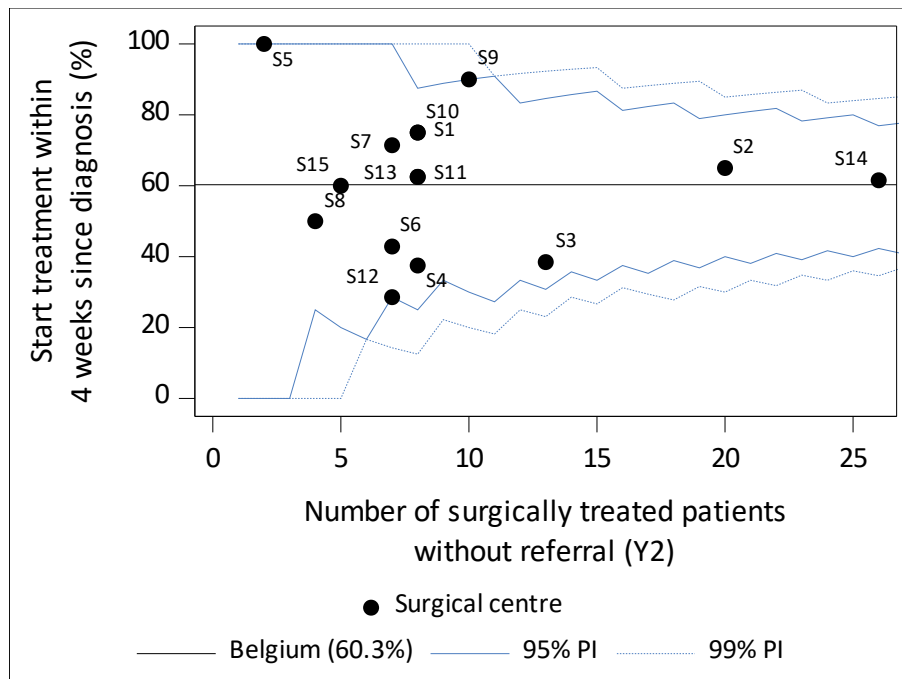


Figure 10: Funnel and spaghetti plot of the proportion of surgically treated patients **without referral** (= direct presentation at expert centre) with **adenocarcinoma** for whom treatment started within 4 weeks since **confirmed** diagnosis, per centre, for (a) year 1, (b) year 2, (c) year 3, (d)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

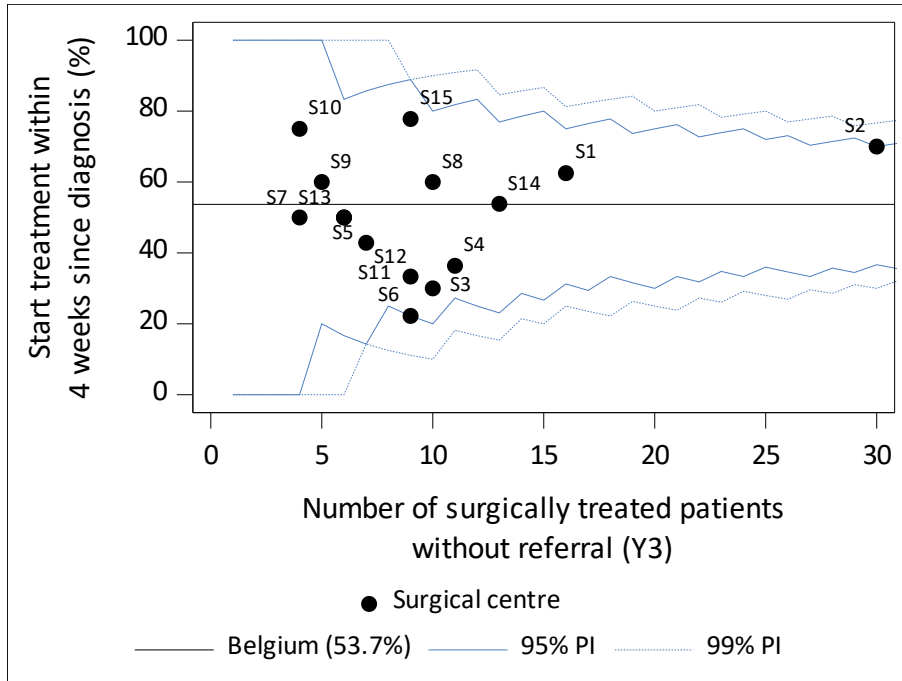
(a)



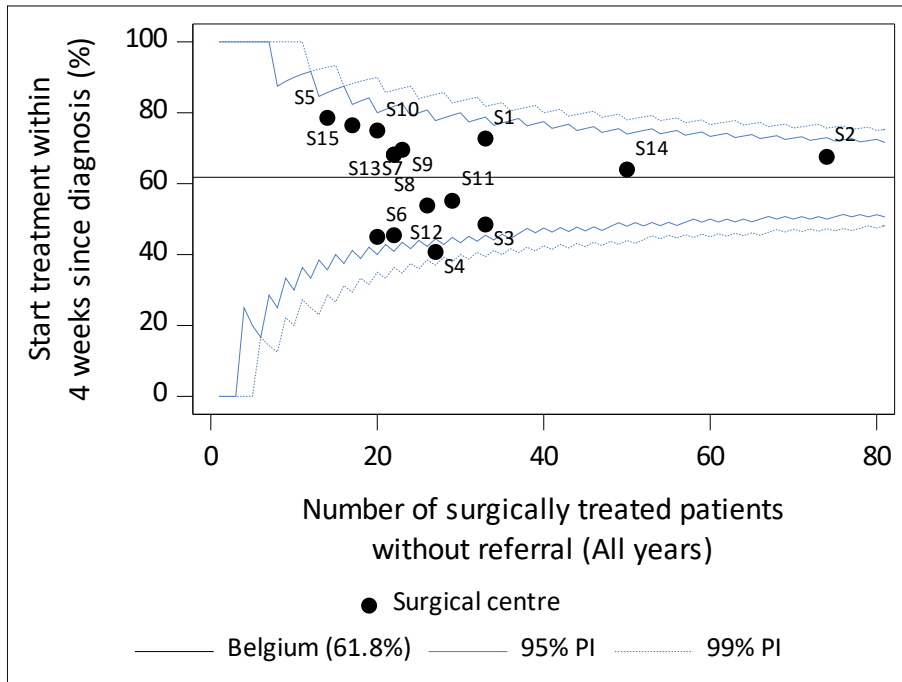
(b)



(c)



(d)



(e)

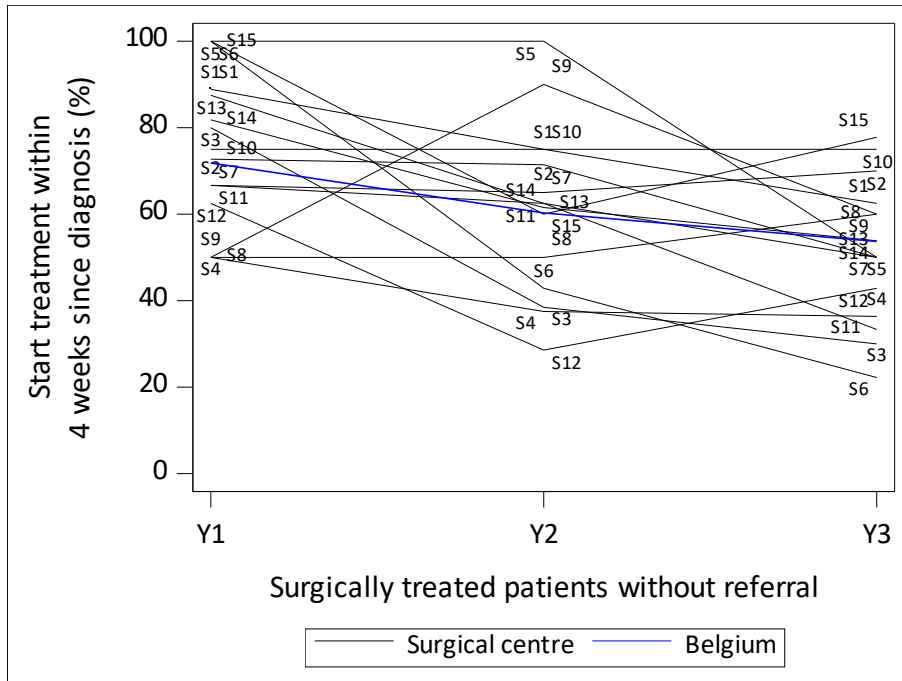


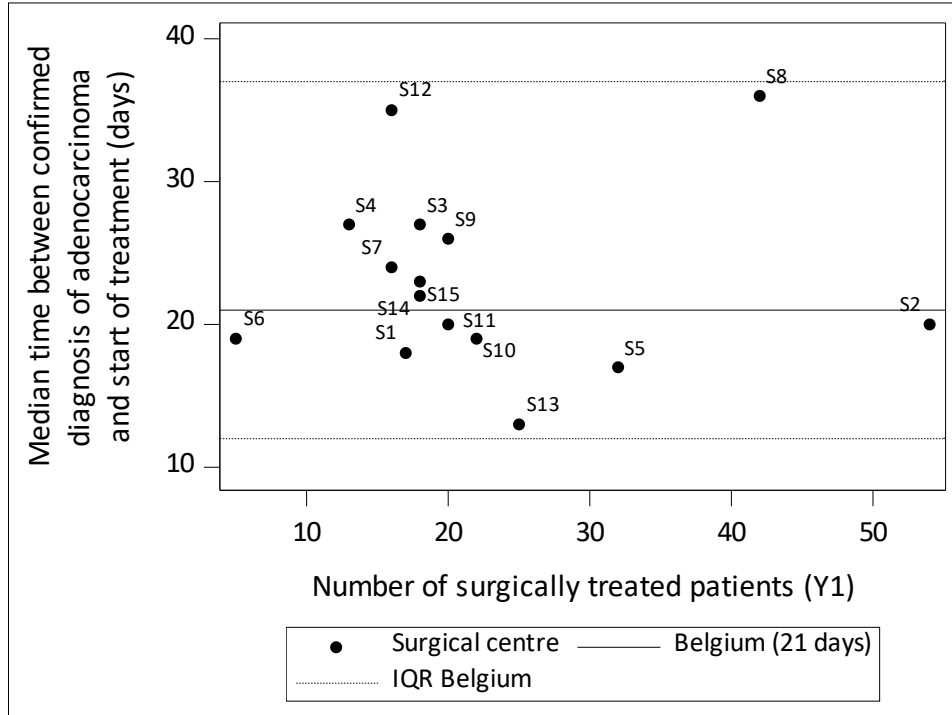
Table 9. Median time between **confirmed** diagnosis of **adenocarcinoma** and start of treatment in the three convention years.

Belgium				
Patient group	N	Median (days)	IQR*	p90**
Total surgically treated patients with confirmed adenocarcinoma	1,073	25	[14, 39]	61
Convention year				
Year 1	336	21	[12, 37]	57
Year 2	367	25	[14, 36]	57
Year 3	370	28	[15, 40]	70
Referral status				
Surgically treated patients referred to an expert centre	641	25	[14, 39]	62
Surgically treated patients without referral	432	24	[13, 38]	57

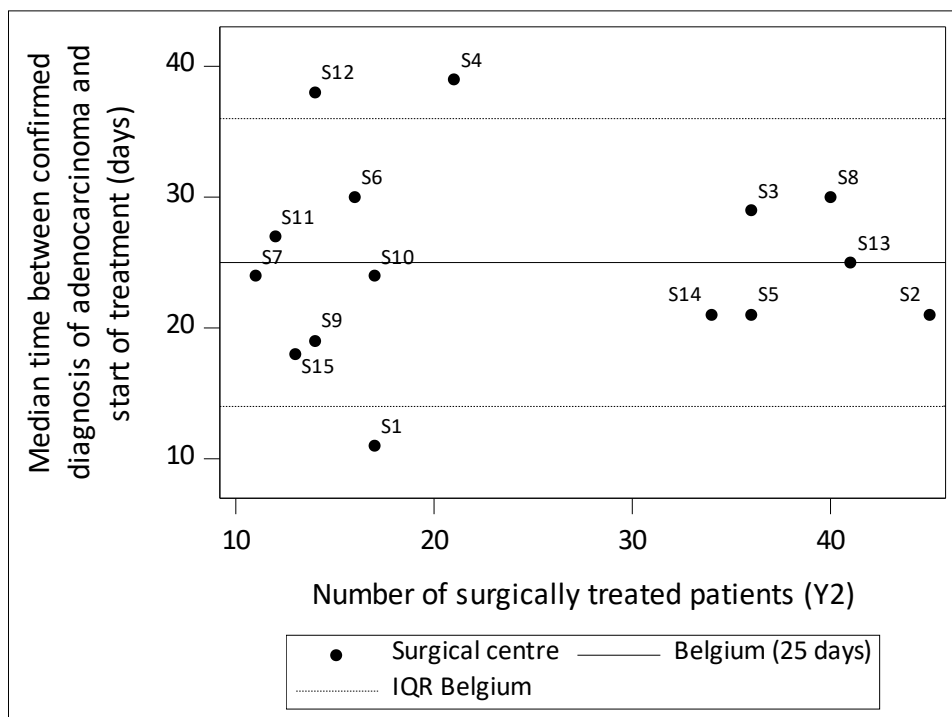
Remark: only surgically patients with a histologically confirmed diagnosis are shown in this table.
 * Interquartile Range= [the 25th, and 75th percentiles of the data]
 ** 90th percentile

Figure 11: Median time between **confirmed** diagnosis of **adenocarcinoma** and start of treatment, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined.

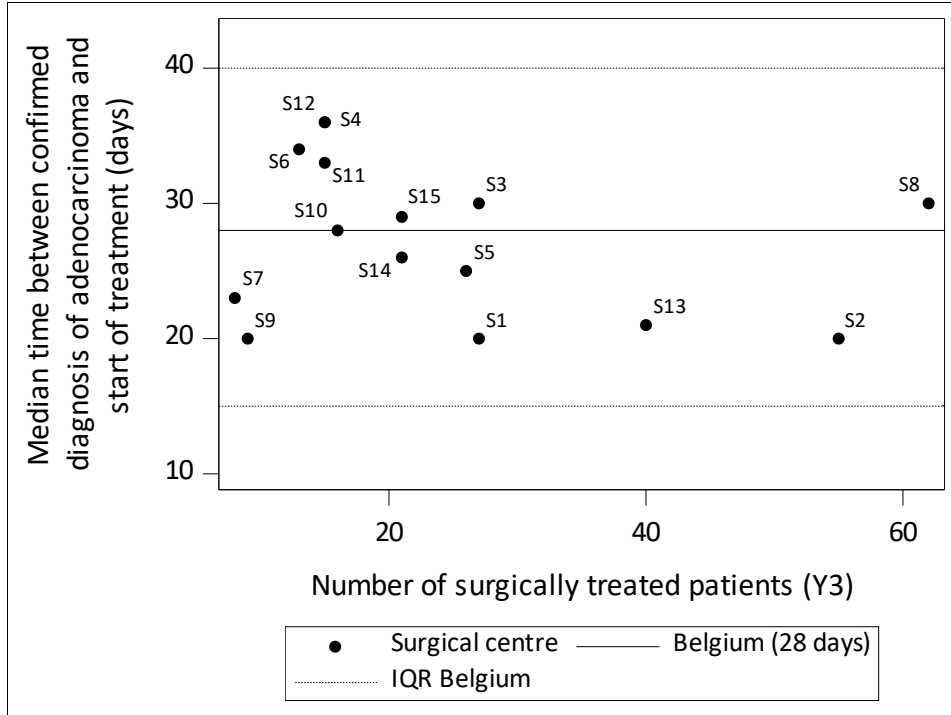
(a)



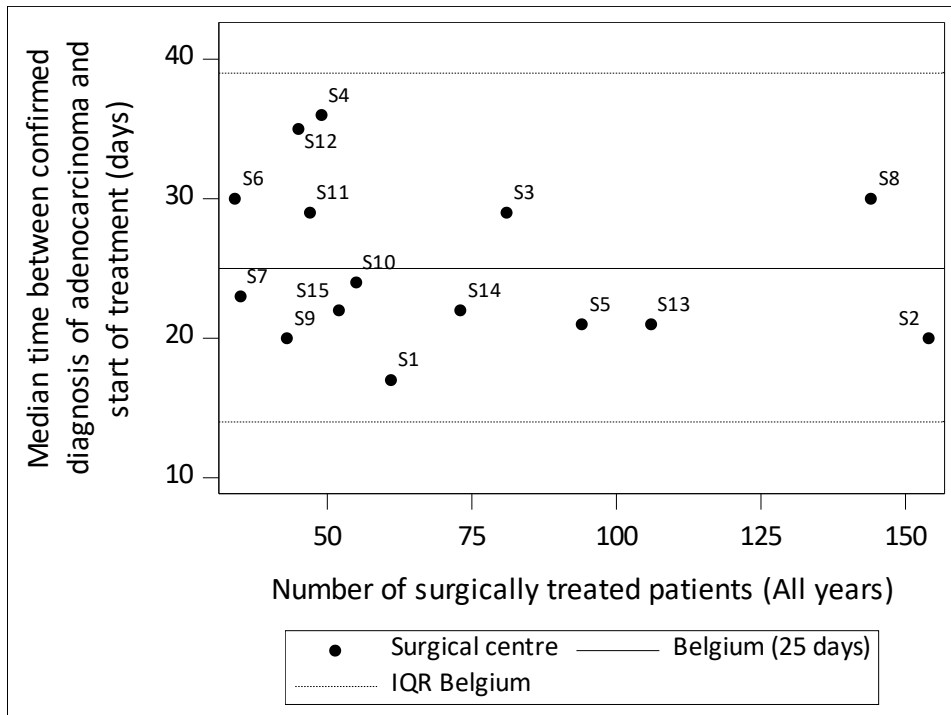
(b)



(c)



(d)



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

Table 10. Length of stay for all patients (**malignant and benign tumours**) surgically treated in the three convention years in an expert centre by surgery type.

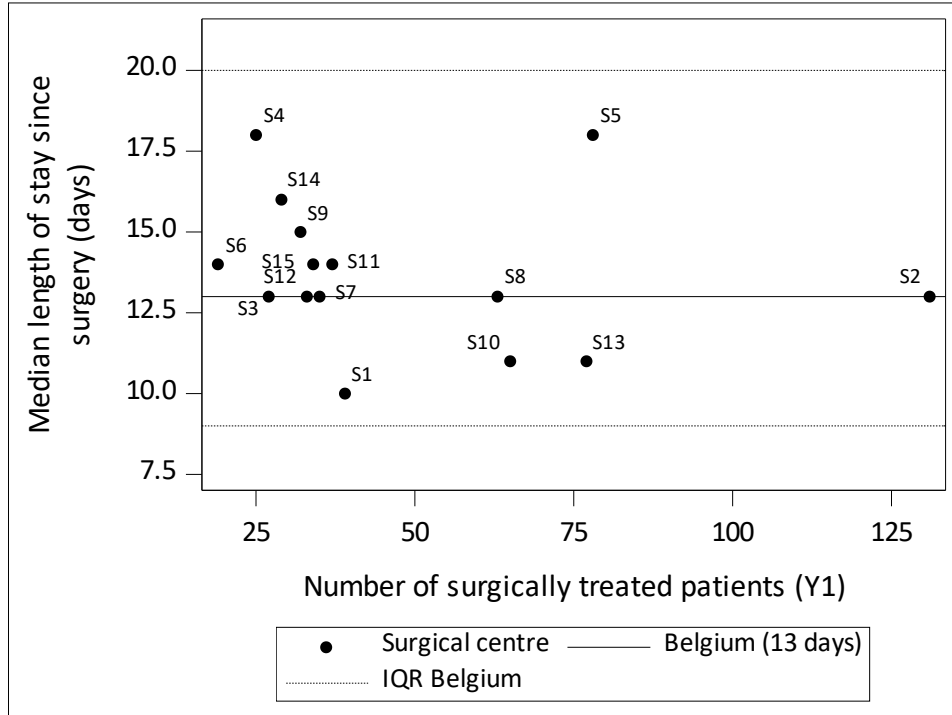
Patient group	N	Belgium	
		Median (days)	IQR*
Length of stay from surgery to discharge Y1+Y2+Y3¹	2,431	12	[9, 19]
Type of surgery			
242830-242841: Pancreaticoduodenectomy	1,646	14	[10, 21]
Pancreaticoduodenectomy	1,504	14	[10, 21]
Total Pancreatectomy	142	15	[11, 22]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	225	10	[8, 15]
242874-242885: Hemipancreatectomy left	517	8	[7, 11]
242896-242900: Enucleation of a pancreatic tumour	43	7	[5, 10]
Convention year			
Year 1	724	13	[9, 20]
Year 2	856	12	[9, 19]
Year 3	851	12	[8, 17]

¹ length of stay longer than 90 days was truncated at 90 days.

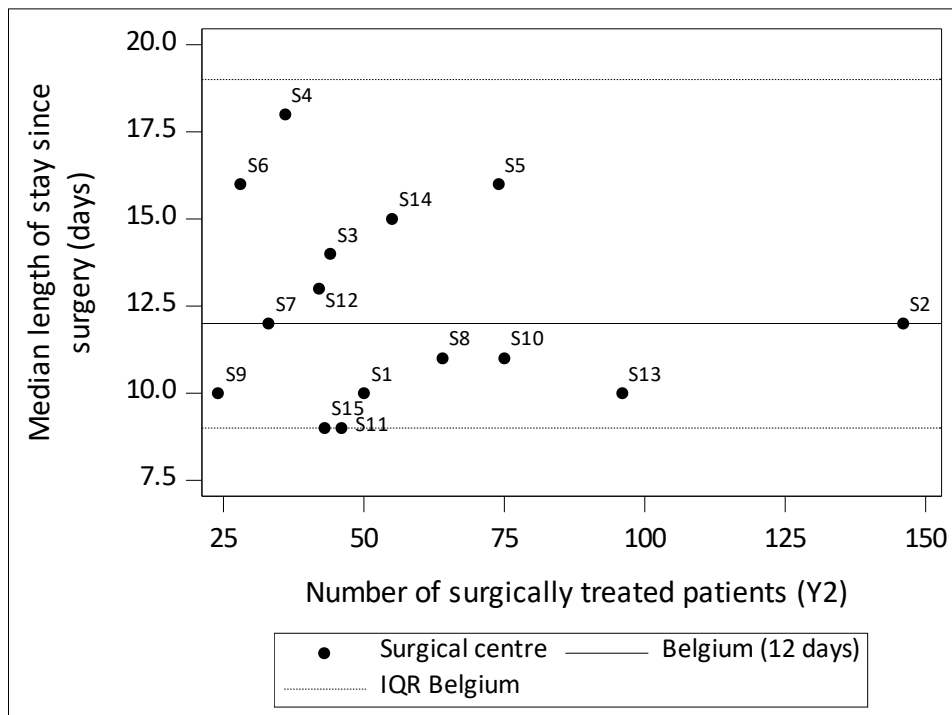
* Interquartile Range= [the 25th, and 75th percentiles of the data]

Figure 12: Median length of stay for all surgically treated patients (malignant and benign tumours) , per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined.

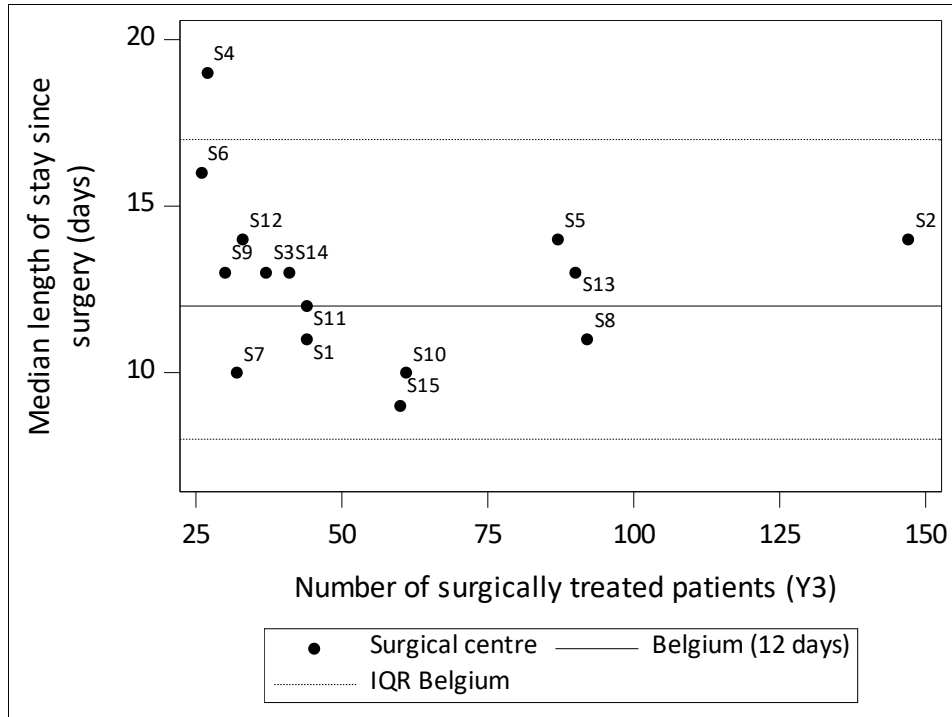
(a)



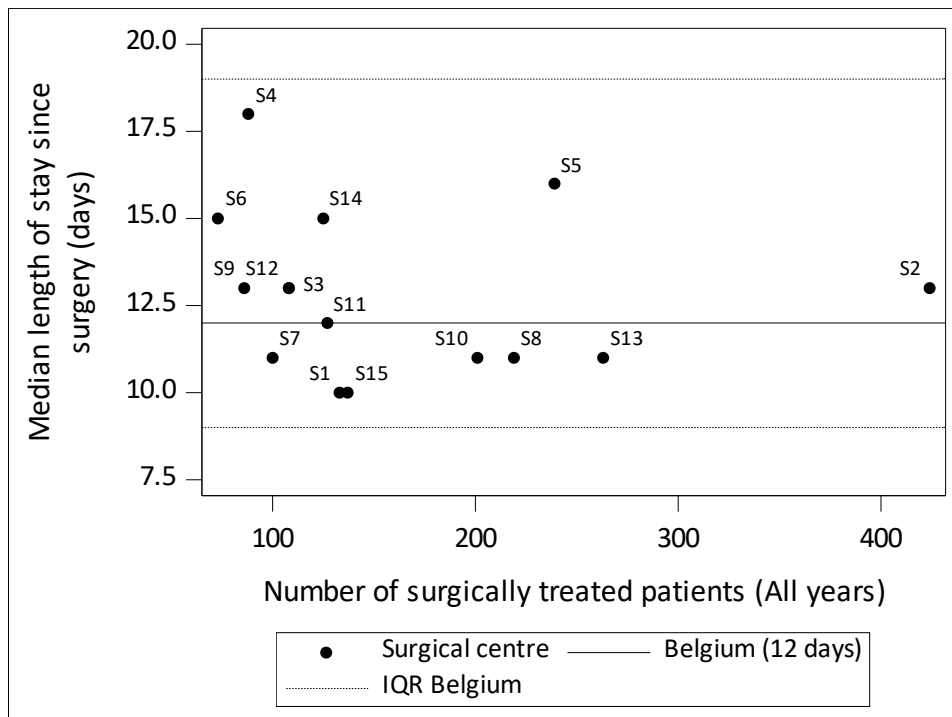
(b)



(c)



(d)



3.2.3. Proportion of surgically treated patients with ≥ 12 lymph nodes examined

Table 11. Proportion of surgically treated patients with **malignant tumours** in the three convention years for whom ≥ 12 lymph nodes were examined, by malignant morphology.

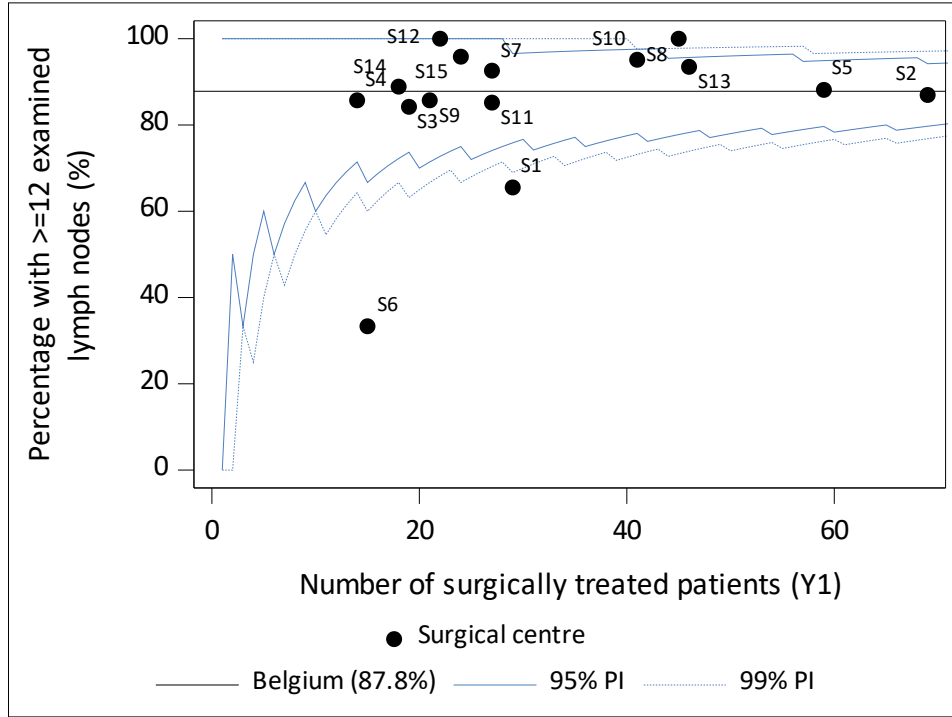
Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Surgically treated patients with ≥ 12 lymph nodes examined, Y1+Y2+Y3	2,058	1,665	80.9	[79.1, 82.6]
Malignant morphology				
Adenocarcinoma	1,590	1,416	89.1	[87.4, 90.5]
Neuroendocrine tumour	302	131	43.4	[37.7, 49.2]
Other or unspecified	166	118	71.1	[63.6, 77.8]

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

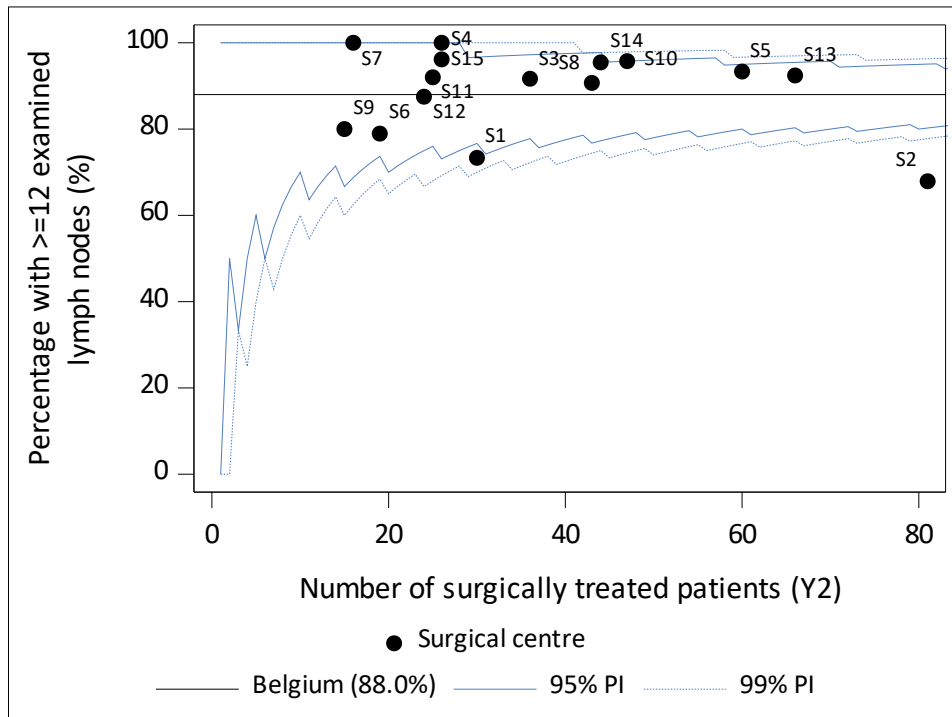
Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Surgically treated patients with adenocarcinoma with ≥ 12 lymph nodes examined, Y1+Y2+Y3	1,590	1,416	89.1	[87.4, 90.5]
Convention year				
Year 1	476	418	87.8	[84.5, 90.6]
Year 2	558	491	88.0	[85.0, 90.6]
Year 3	556	507	91.2	[88.5, 93.4]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	1,285	1,178	91.7	[90.0, 93.1]
Pancreaticoduodenectomy	1,197	1,097	91.6	[89.9, 93.2]
Total Pancreatectomy	88	81	92.0	[84.3, 96.7]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	106	78	73.6	[64.1, 81.7]
242874-242885: Hemipancreatectomy left	197	158	80.2	[73.9, 85.5]
242896-242900: Enucleation of a pancreatic tumour	2	2	100.0	[15.8, 100.0]

Figure 13: Funnel and spaghetti plot of the proportion of surgically treated patients with adenocarcinoma for whom ≥ 12 lymph nodes were examined, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

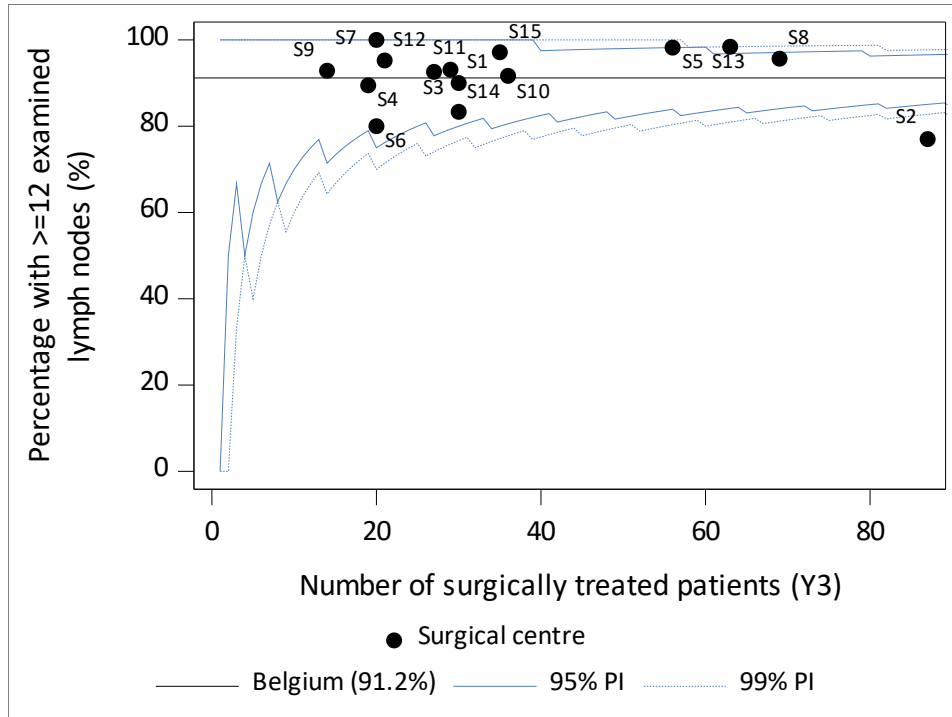
(a)



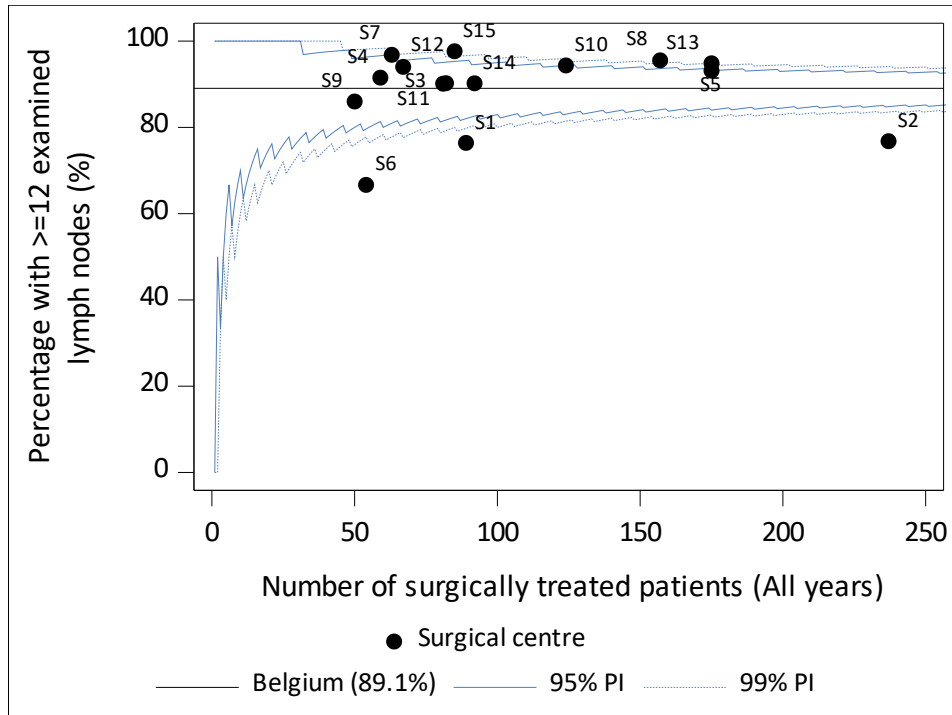
(b)



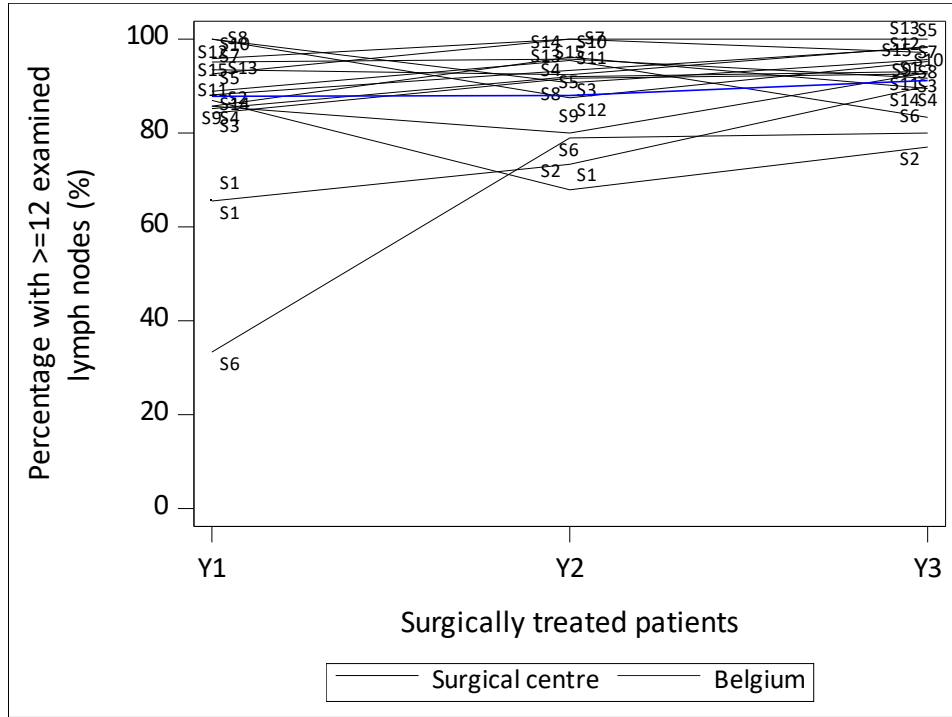
(c)



(d)



(e)



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 **benign and malignant tumoural** pathology in the three convention years, by patient and tumour characteristics.

Characteristic	Unadjusted 30-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
Overall Y1+Y2+Y3	2,431	59	2.4	[1.9, 3.1]
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]
Sex				
Male	1,300	37	2.8	[2.0, 3.9]
Female	1,131	22	1.9	[1.2, 2.9]
Age at surgery				
<=69	1,393	25	1.8	[1.2, 2.6]
70-79	828	25	3.0	[2.0, 4.4]
>=80	210	9	4.3	[2.0, 8.0]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	2,362	56	2.4	[1.8, 3.1]
Relapse of primary tumour	40	2	5.0	[0.6, 16.9]
Metastasis	29	1	3.4	[0.1, 17.8]
Morphology				
Adenocarcinoma	1,590	50	3.1	[2.3, 4.1]
Neuroendocrine tumour	302	2	0.7	[0.1, 2.4]
Benign tumour	373	4	1.1	[0.3, 2.7]
Other or unspecified	166	3	1.8	[0.4, 5.2]
Primary tumour localisation				
C17.0 Duodenum	96	6	6.3	[2.3, 13.1]
C24.0 Extrahepatic bile duct	139	6	4.3	[1.6, 9.2]
C24.1 (Peri-) ampullary region	200	7	3.5	[1.4, 7.1]
C25.0 Head of pancreas	926	28	3.0	[2.0, 4.3]

Characteristic	Unadjusted 30-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
C25.1 Body of pancreas	188	2	1.1	[0.1, 3.8]
C25.2 Tail of pancreas	291	0	0.0	[0.0, 1.3]
C25.3 Pancreatic duct	10	0	0.0	[0.0, 30.8]
C25.4 Islands of Langerhans	27	0	0.0	[0.0, 12.8]
C25.7-9 Other specified parts of pancreas	122	4	3.3	[0.9, 8.2]
Other	59	2	3.4	[0.4, 11.7]
Missing or benign	373	4	1.1	[0.3, 2.7]
Clinical stage				
0	30	0	0.0	[0.0, 11.6]
I	939	27	2.9	[1.9, 4.2]
II	561	14	2.5	[1.4, 4.2]
III	200	4	2.0	[0.5, 5.0]
IV	55	0	0.0	[0.0, 6.5]
X	203	8	3.9	[1.7, 7.6]
TNM not applicable or relapse*	443	6	1.4	[0.5, 2.9]
Prior surgery or other treatment **				
Prior abdominal surgery	357	12	3.4	[1.7, 5.8]
Other treatment modality (that could affect the pancreas)	282	9	3.2	[1.5, 6.0]
Neoadjuvant treatment				
Chemoradiotherapy	41	0	0.0	[0.0, 8.6]
Chemotherapy	317	2	0.6	[0.1, 2.3]
Radiotherapy	2	0	0.0	[0.0, 84.2]
No chemo or radiation treatment	2,071	57	2.8	[2.1, 3.6]
Charlson Comorbidity Index				
0	1,006	8	0.8	[0.3, 1.6]
1	571	22	3.9	[2.4, 5.8]
2	402	15	3.7	[2.1, 6.1]
3	202	5	2.5	[0.8, 5.7]
4	112	2	1.8	[0.2, 6.3]
5	49	2	4.1	[0.5, 14.0]
6	42	3	7.1	[1.5, 19.5]
7	21	1	4.8	[0.1, 23.8]
8	12	0	0.0	[0.0, 26.5]
9	8	1	12.5	[0.3, 52.7]
10	4	0	0.0	[0.0, 60.2]
11	1	0	0.0	[0.0, 97.5]
12	1	0	0.0	[0.0, 97.5]

Characteristic	Unadjusted 30-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
WHO score at surgery				
0 - Asymptomatic, normal activity	744	11	1.5	[0.7, 2.6]
1 - Symptomatic, but ambulant	1,421	36	2.5	[1.8, 3.5]
2 - Symptomatic, bedbound < 50% day	226	10	4.4	[2.1, 8.0]
3 - Symptomatic, bedbound > 50% day	38	2	5.3	[0.6, 17.7]
4 - Completely dependent, 100% bedbound	2	0	0.0	[0.0, 84.2]
ASA score				
1 - Healthy person	201	2	1.0	[0.1, 3.5]
2 - Mild systemic disease, normal activity	1,316	25	1.9	[1.2, 2.8]
3 - Serious systemic disease, limited activity	887	30	3.4	[2.3, 4.8]
4 - Life-threatening illness, handicapped	27	2	7.4	[0.9, 24.3]
Resectability status **				
Before neoadjuvant treatment				
Upfront resectable	45	0	0.0	[0.0, 7.9]
Borderline resectable	116	1	0.9	[0.0, 4.7]
Unresectable	41	1	2.4	[0.1, 12.9]
No neoadjuvant treatment	944	29	3.1	[2.1, 4.4]
Before surgery				
Upfront resectable	987	29	2.9	[2.0, 4.2]
Borderline resectable	146	2	1.4	[0.2, 4.9]
Unresectable	6	0	0.0	[0.0, 45.9]
Missing	7	0	0.0	[0.0, 41.0]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	724	9	1.2	[0.6, 2.3]
Minimally invasive surgery (MIS) - Hybrid	4	0	0.0	[0.0, 60.2]
Minimally invasive surgery (MIS) - Robotic	174	2	1.1	[0.1, 4.1]
Open	1,414	39	2.8	[2.0, 3.8]
Conversion from MIS to open surgery	115	9	7.8	[3.6, 14.3]
Simultaneous venous resection				
No	2,127	49	2.3	[1.7, 3.0]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	304	10	3.3	[1.6, 6.0]
- With primary wedge-reconstruction	89	3	3.4	[0.7, 9.5]
- With primary end-to-end reconstruction	146	4	2.7	[0.8, 6.9]
- With vascular autograft interposition	7	0	0.0	[0.0, 41.0]
- With vascular allograft interposition	21	1	4.8	[0.1, 23.8]
- With synthetic/prosthetic interposition	6	2	33.3	[4.3, 77.7]
- With peritoneal patch wedge-reconstruction	31	0	0.0	[0.0, 11.2]

Characteristic	Unadjusted 30-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
- Without reconstruction	4	0	0.0	[0.0, 60.2]
<i>Simultaneous arterial resection **</i>				
No	2,386	58	2.4	[1.9, 3.1]
Hepatic artery resection	18	0	0.0	[0.0, 18.5]
- With primary end-to-end reconstruction	12	0	0.0	[0.0, 26.5]
- With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
- Without reconstruction	5	0	0.0	[0.0, 52.2]
Coeliac trunk resection	20	1	5.0	[0.1, 24.9]
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]
- Without reconstruction	19	1	5.3	[0.1, 26.0]
Superior mesenteric artery (SMA) resection	6	0	0.0	[0.0, 45.9]
- With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]
- With vascular autograft interposition	2	0	0.0	[0.0, 84.2]
- Without reconstruction	2	0	0.0	[0.0, 84.2]
<i>Simultaneous other organ resection **</i>				
No	1,522	40	2.6	[1.9, 3.6]
Colon	56	4	7.1	[2.0, 17.3]
Stomach	333	12	3.6	[1.9, 6.2]
Adrenal gland	47	0	0.0	[0.0, 7.5]
Spleen	478	6	1.3	[0.5, 2.7]
Other	171	2	1.2	[0.1, 4.2]
<i>RIZIV code for complex surgery</i>				
242830-242841: Pancreaticoduodenectomy	1,646	51	3.1	[2.3, 4.1]
Pancreaticoduodenectomy	1,504	45	3.0	[2.2, 4.0]
Total Pancreatectomy	142	6	4.2	[1.6, 9.0]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	225	4	1.8	[0.5, 4.5]
242874-242885: Hemipancreatectomy left	517	3	0.6	[0.1, 1.7]
242896-242900: Enucleation of a pancreatic tumour	43	1	2.3	[0.1, 12.3]
<i>Antithrombotic medication</i>				
No	1,717	29	1.7	[1.1, 2.4]
Yes	714	30	4.2	[2.9, 5.9]
<i>Was the patient referred?</i>				
No	1,098	28	2.6	[1.7, 3.7]
Yes	1,333	31	2.3	[1.6, 3.3]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI

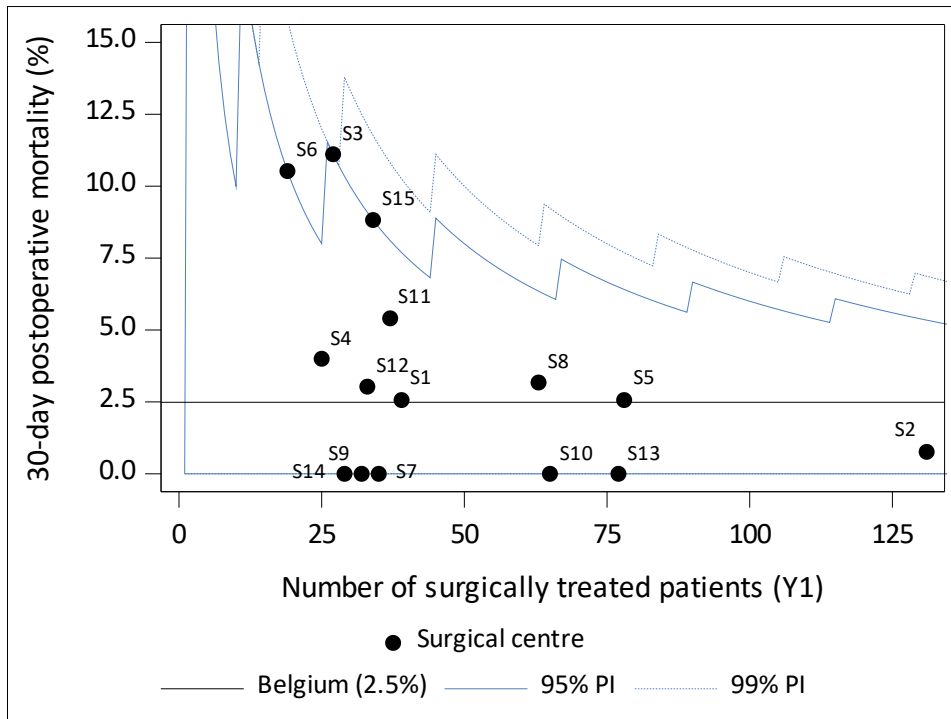
* Tumour staging not possible.

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

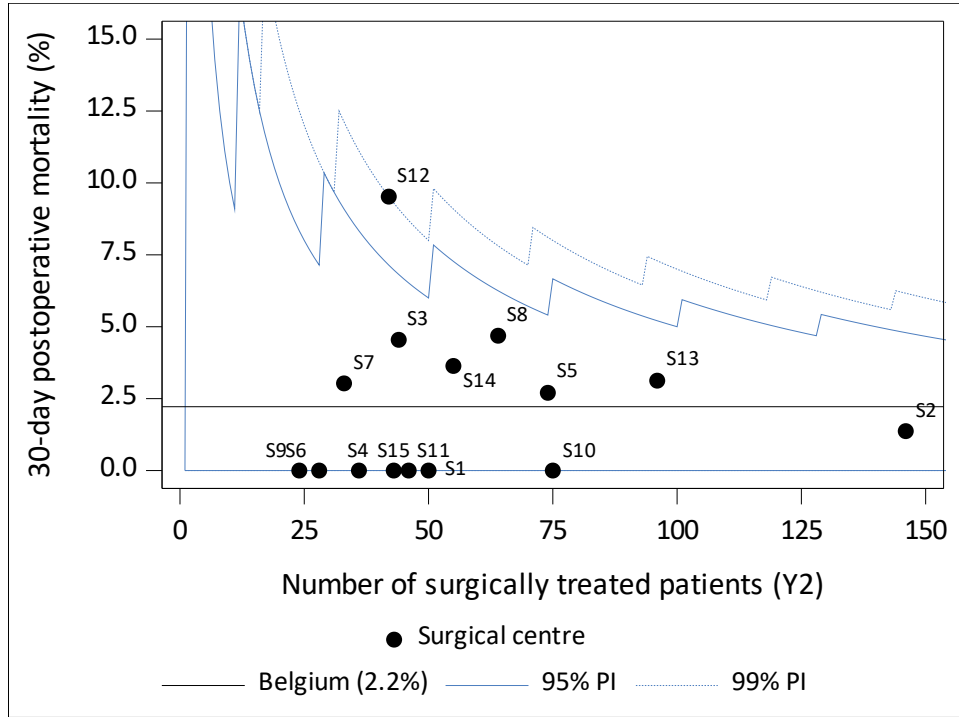
** Results for this variable are only for malignant tumours and only available from the second half of Y2 onwards.

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

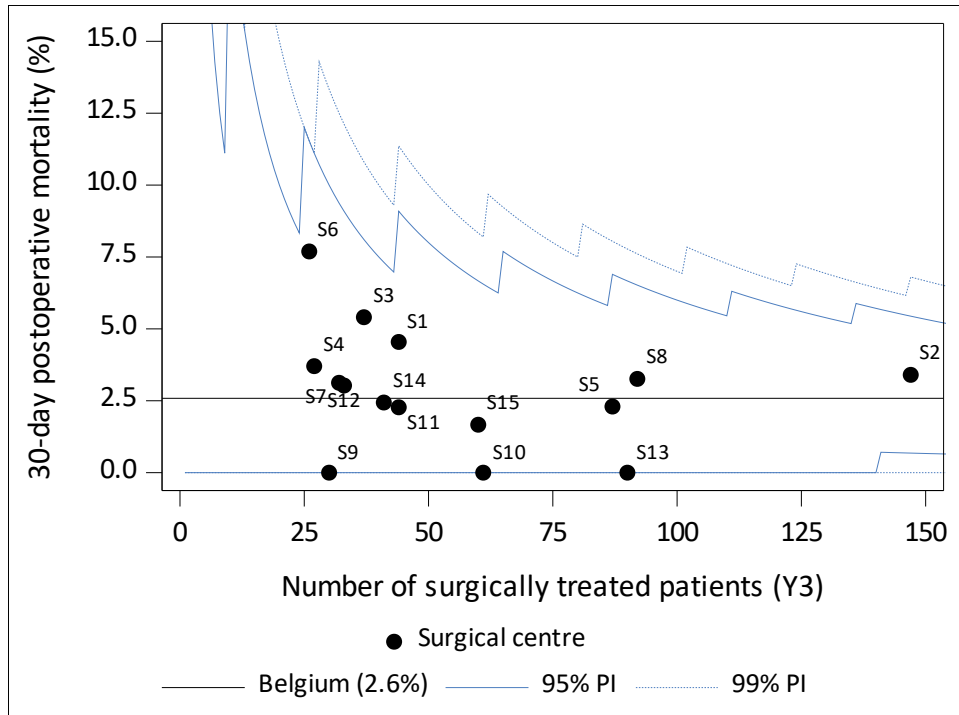
(a)



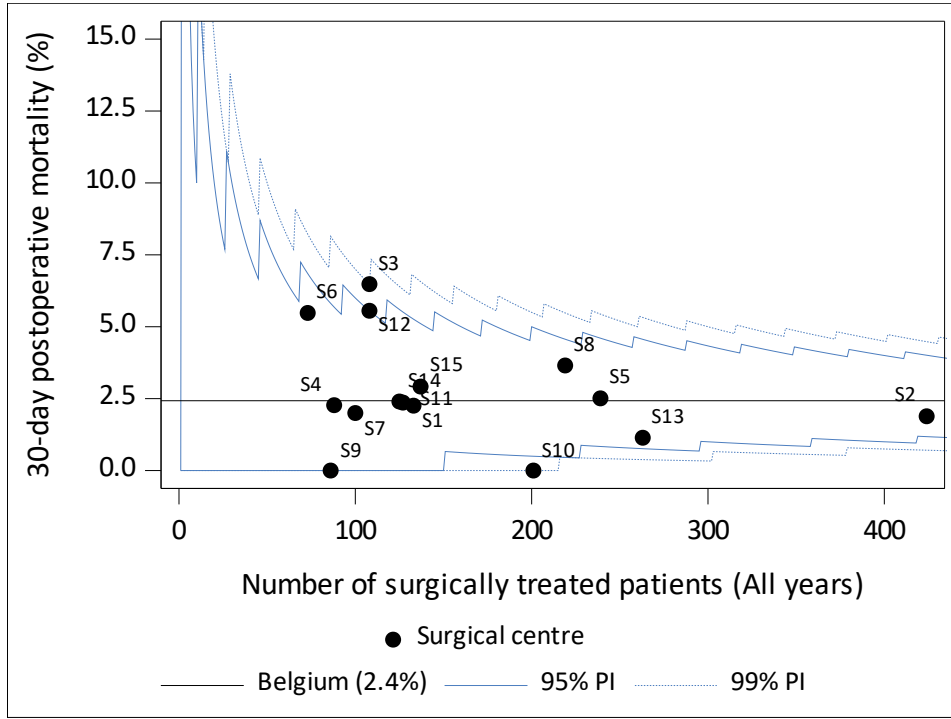
(b)



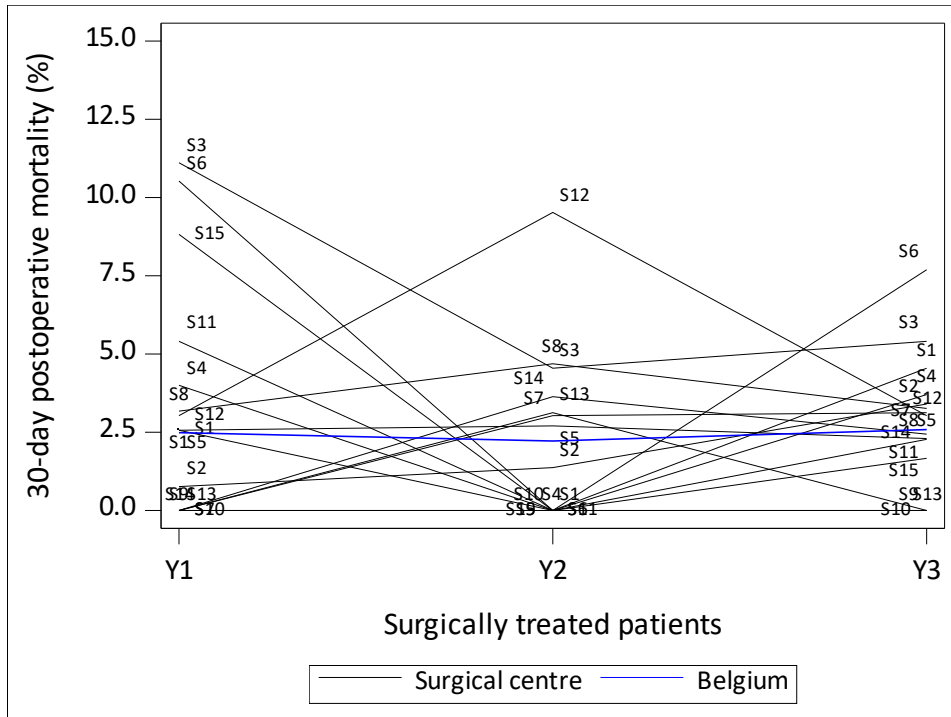
(c)



(d)



(e)



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 **benign and malignant tumoural** pathology, in the three convention years.

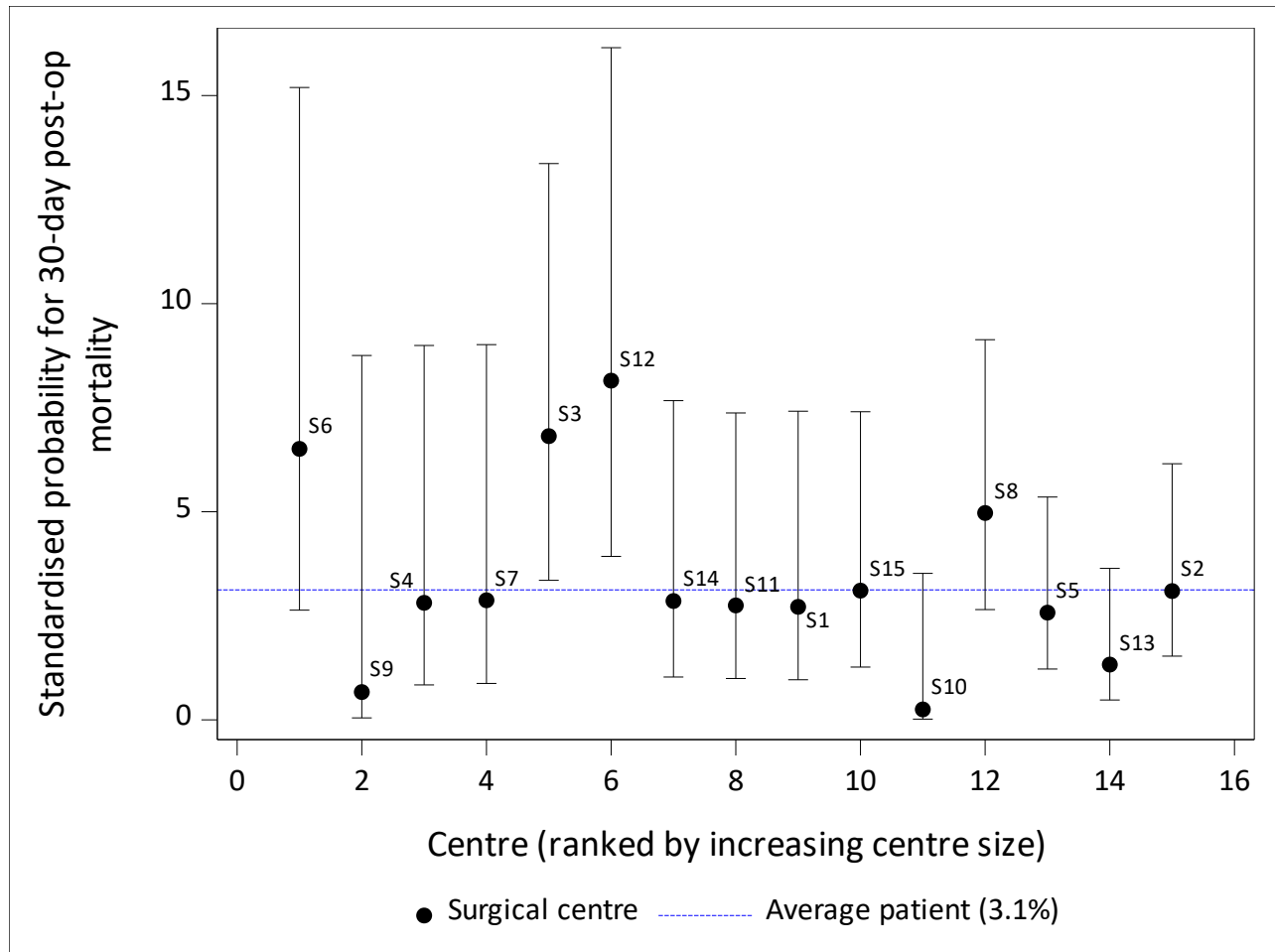
Expert centres	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	1.03	[0.36, 2.99]	1.22	2.7	[1.0, 7.4]	3.1
S2	1.18	[0.53, 2.64]	1.22	3.1	[1.5, 6.2]	3.1
S3	2.78	[1.26, 6.14]	1.22	6.8	[3.4, 13.4]	3.1
S4	1.07	[0.32, 3.60]	1.22	2.8	[0.8, 9.0]	3.1
S5	0.98	[0.44, 2.17]	1.22	2.6	[1.2, 5.4]	3.1
S6	2.64	[1.00, 6.97]	1.22	6.5	[2.6, 15.2]	3.1
S7	1.09	[0.33, 3.61]	1.22	2.9	[0.9, 9.0]	3.1
S8	1.96	[0.96, 4.01]	1.22	5.0	[2.6, 9.1]	3.1
S9	0.24	[0.02, 3.01]	1.22	0.7	[0.0, 8.8]	3.1
S10	0.09	[0.01, 1.13]	1.22	0.3	[0.0, 3.5]	3.1
S11	1.04	[0.37, 2.96]	1.22	2.7	[1.0, 7.4]	3.1
S12	3.40	[1.48, 7.82]	1.22	8.2	[3.9, 16.2]	3.1
S13	0.49	[0.18, 1.37]	1.22	1.3	[0.5, 3.6]	3.1
S14	1.09	[0.38, 3.08]	1.22	2.9	[1.0, 7.7]	3.1
S15	1.19	[0.46, 3.04]	1.22	3.1	[1.3, 7.4]	3.1

Adjusted for age at diagnosis, sex, ASA score, Charlson Comorbidity Index, type of surgery, vascular resection/reconstruction and tumor 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 and direct standardized result are weighted averages 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: Standardised probability for the 30-day postoperative mortality in the three convention years, by surgical centre.



3.3.1.3. Unadjusted 90-day postoperative mortality

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

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Overall Y1+Y2+Y3	2,431	125	5.1	[4.3, 6.1]
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]
Sex				
Male	1,300	69	5.3	[4.2, 6.7]
Female	1,131	56	5.0	[3.8, 6.4]
Age at surgery				
<=69	1,393	47	3.4	[2.5, 4.5]
70-79	828	57	6.9	[5.3, 8.8]
>=80	210	21	10.0	[6.3, 14.9]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	2,362	118	5.0	[4.2, 6.0]
Relapse of primary tumour	40	4	10.0	[2.8, 23.7]
Metastasis	29	3	10.3	[2.2, 27.4]
Morphology				
Adenocarcinoma	1,590	107	6.7	[5.5, 8.1]
Neuroendocrine tumour	302	7	2.3	[0.9, 4.7]
Benign tumour	373	6	1.6	[0.6, 3.5]
Other or unspecified	166	5	3.0	[1.0, 6.9]
Primary tumour localisation				
C17.0 Duodenum	96	11	11.5	[5.9, 19.6]
C24.0 Extrahepatic bile duct	139	12	8.6	[4.5, 14.6]
C24.1 (Peri-) ampullary region	200	11	5.5	[2.8, 9.6]
C25.0 Head of pancreas	926	61	6.6	[5.1, 8.4]
C25.1 Body of pancreas	188	9	4.8	[2.2, 8.9]
C25.2 Tail of pancreas	291	5	1.7	[0.6, 4.0]
C25.3 Pancreatic duct	10	0	0.0	[0.0, 30.8]
C25.4 Islands of Langerhans	27	0	0.0	[0.0, 12.8]
C25.7-9 Other specified parts of pancreas	122	6	4.9	[1.8, 10.4]
Other	59	4	6.8	[1.9, 16.5]

Unadjusted 90-day postoperative mortality					
Belgium					
Characteristic	N	N of deaths	%	95% CI	
Missing or benign	373	6	1.6	[0.6, 3.5]	
Clinical stage					
0	30	0	0.0	[0.0, 11.6]	
I	939	47	5.0	[3.7, 6.6]	
II	561	36	6.4	[4.5, 8.8]	
III	200	12	6.0	[3.1, 10.2]	
IV	55	3	5.5	[1.1, 15.1]	
X	203	16	7.9	[4.6, 12.5]	
TNM not applicable or relapse*	443	11	2.5	[1.2, 4.4]	
Prior surgery or other treatment **					
Prior abdominal surgery	357	22	6.2	[3.9, 9.2]	
Other treatment modality (that could affect the pancreas)	282	24	8.5	[5.5, 12.4]	
Neoadjuvant treatment					
Chemoradiotherapy	41	1	2.4	[0.1, 12.9]	
Chemotherapy	317	8	2.5	[1.1, 4.9]	
Radiotherapy	2	0	0.0	[0.0, 84.2]	
No chemo or radiation treatment	2,071	116	5.6	[4.7, 6.7]	
Charlson Comorbidity Index					
0	1,006	26	2.6	[1.7, 3.8]	
1	571	36	6.3	[4.5, 8.6]	
2	402	24	6.0	[3.9, 8.8]	
3	202	10	5.0	[2.4, 8.9]	
4	112	9	8.0	[3.7, 14.7]	
5	49	8	16.3	[7.3, 29.7]	
6	42	5	11.9	[4.0, 25.6]	
7	21	3	14.3	[3.0, 36.3]	
8	12	1	8.3	[0.2, 38.5]	
9	8	1	12.5	[0.3, 52.7]	
10	4	2	50.0	[6.8, 93.2]	
11	1	0	0.0	[0.0, 97.5]	
12	1	0	0.0	[0.0, 97.5]	
WHO score at surgery					
0 - Asymptomatic, normal activity	744	21	2.8	[1.8, 4.3]	
1 - Symptomatic, but ambulant	1,421	72	5.1	[4.0, 6.3]	
2 - Symptomatic, bedbound < 50% day	226	26	11.5	[7.7, 16.4]	
3 - Symptomatic, bedbound > 50% day	38	5	13.2	[4.4, 28.1]	
4 - Completely dependent, 100% bedbound	2	1	50.0	[1.3, 98.7]	
ASA score					

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
1 - Healthy person	201	4	2.0	[0.5, 5.0]
2 - Mild systemic disease, normal activity	1,316	56	4.3	[3.2, 5.5]
3 - Serious systemic disease, limited activity	887	61	6.9	[5.3, 8.7]
4 - Life-threatening illness, handicapped	27	4	14.8	[4.2, 33.7]
Resectability status **				
Before neoadjuvant treatment				
Upfront resectable	45	1	2.2	[0.1, 11.8]
Borderline resectable	116	3	2.6	[0.5, 7.4]
Unresectable	41	3	7.3	[1.5, 19.9]
No neoadjuvant treatment	944	62	6.6	[5.1, 8.3]
Before surgery				
Upfront resectable	987	61	6.2	[4.8, 7.9]
Borderline resectable	146	7	4.8	[1.9, 9.6]
Unresectable	6	0	0.0	[0.0, 45.9]
Missing	7	1	14.3	[0.4, 57.9]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	724	19	2.6	[1.6, 4.1]
Minimally invasive surgery (MIS) - Hybrid	4	1	25.0	[0.6, 80.6]
Minimally invasive surgery (MIS) - Robotic	174	5	2.9	[0.9, 6.6]
Open	1,414	88	6.2	[5.0, 7.6]
Conversion from MIS to open surgery	115	12	10.4	[5.5, 17.5]
Simultaneous venous resection				
No	2,127	101	4.7	[3.9, 5.7]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	304	24	7.9	[5.1, 11.5]
- With primary wedge-reconstruction	89	7	7.9	[3.2, 15.5]
- With primary end-to-end reconstruction	146	13	8.9	[4.8, 14.7]
- With vascular autograft interposition	7	0	0.0	[0.0, 41.0]
- With vascular allograft interposition	21	1	4.8	[0.1, 23.8]
- With synthetic/prosthetic interposition	6	2	33.3	[4.3, 77.7]
- With peritoneal patch wedge-reconstruction	31	1	3.2	[0.1, 16.7]
- Without reconstruction	4	0	0.0	[0.0, 60.2]
Simultaneous arterial resection **				
No	2,386	123	5.2	[4.3, 6.1]
Hepatic artery resection	18	0	0.0	[0.0, 18.5]
- With primary end-to-end reconstruction	12	0	0.0	[0.0, 26.5]
- With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
- Without reconstruction	5	0	0.0	[0.0, 52.2]
Coeliac trunk resection	20	1	5.0	[0.1, 24.9]

Unadjusted 90-day postoperative mortality					
Belgium					
Characteristic	N	N of deaths	%	95% CI	
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]	
- Without reconstruction	19	1	5.3	[0.1, 26.0]	
Superior mesenteric artery (SMA) resection	6	1	16.7	[0.4, 64.1]	
- With primary wedge-reconstruction	1	1	100.0	[2.5, 100.0]	
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]	
- With vascular autograft interposition	2	0	0.0	[0.0, 84.2]	
- Without reconstruction	2	0	0.0	[0.0, 84.2]	
Simultaneous other organ resection **					
No	1,522	86	5.7	[4.5, 6.9]	
Colon	56	5	8.9	[3.0, 19.6]	
Stomach	333	22	6.6	[4.2, 9.8]	
Adrenal gland	47	1	2.1	[0.1, 11.3]	
Spleen	478	15	3.1	[1.8, 5.1]	
Other	171	5	2.9	[1.0, 6.7]	
RIZIV code for complex surgery					
242830-242841: Pancreaticoduodenectomy	1,646	104	6.3	[5.2, 7.6]	
Pancreaticoduodenectomy	1,504	91	6.1	[4.9, 7.4]	
Total Pancreatectomy	142	13	9.2	[5.0, 15.1]	
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	225	8	3.6	[1.5, 6.9]	
242874-242885: Hemipancreatectomy left	517	12	2.3	[1.2, 4.0]	
242896-242900: Enucleation of a pancreatic tumour	43	1	2.3	[0.1, 12.3]	
Antithrombotic medication					
No	1,717	71	4.1	[3.2, 5.2]	
Yes	714	54	7.6	[5.7, 9.8]	
Was the patient referred?					
No	1,098	56	5.1	[3.9, 6.6]	
Yes	1,333	69	5.2	[4.0, 6.5]	

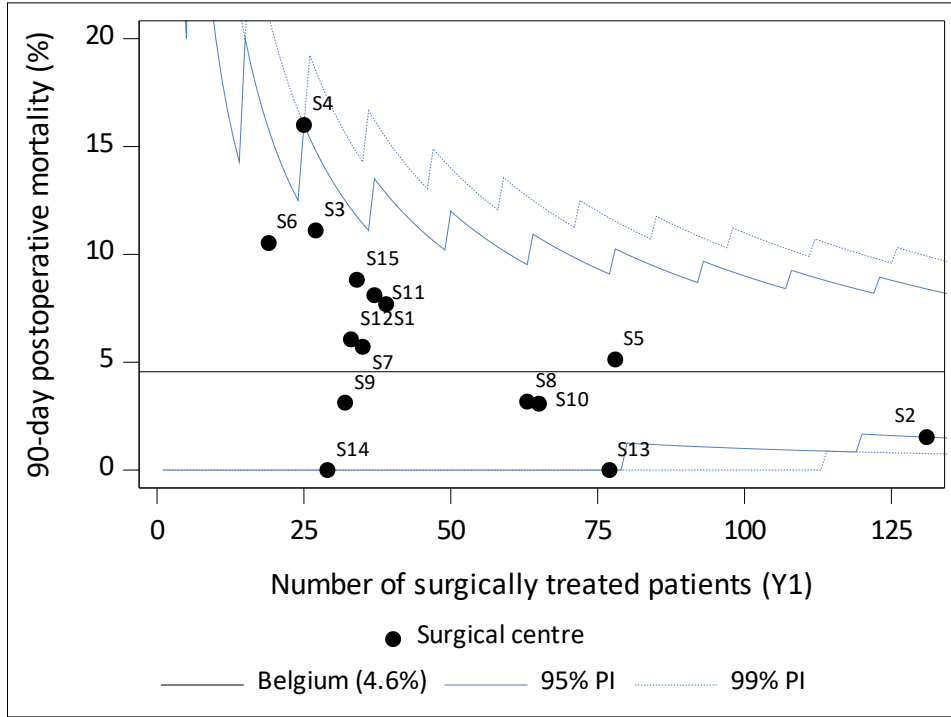
* Tumour staging not possible.

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

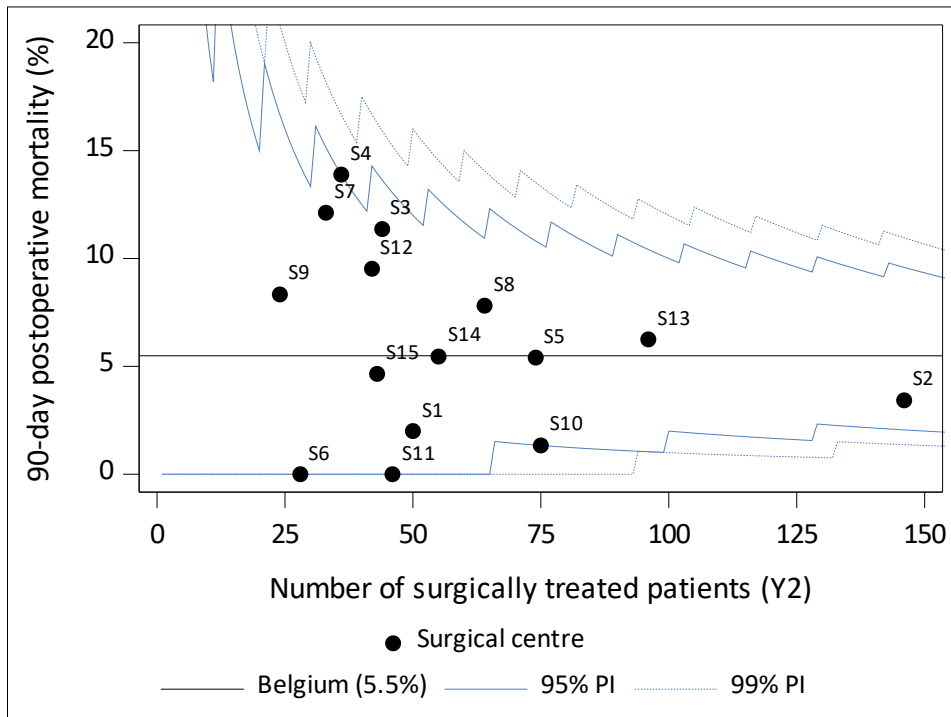
** Results for this variable are only for malignant tumours and are only available from the second half of Y2 onwards.

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

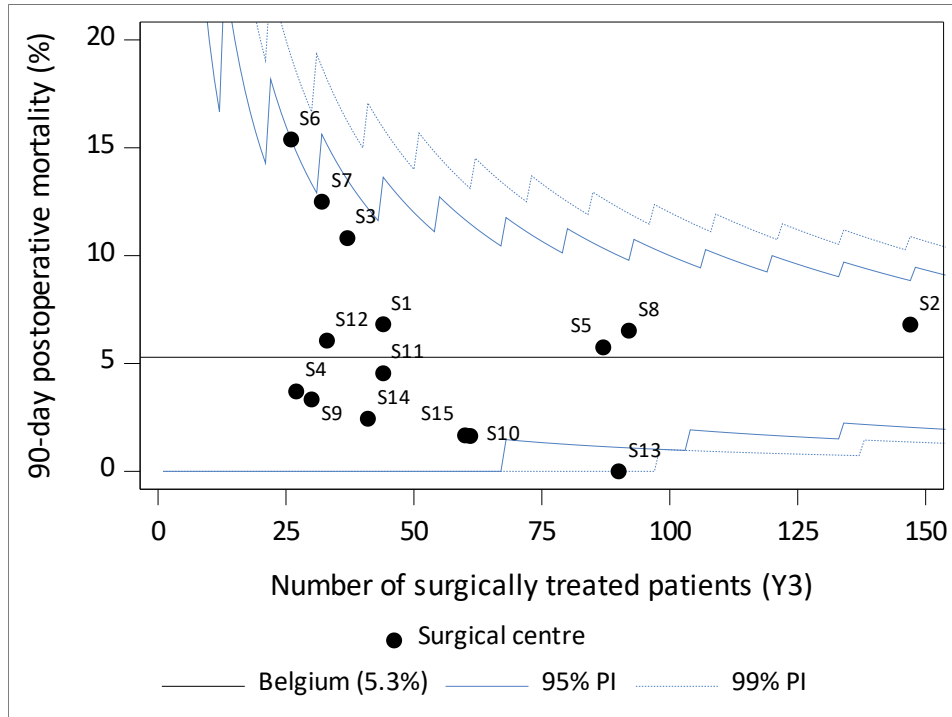
(a)



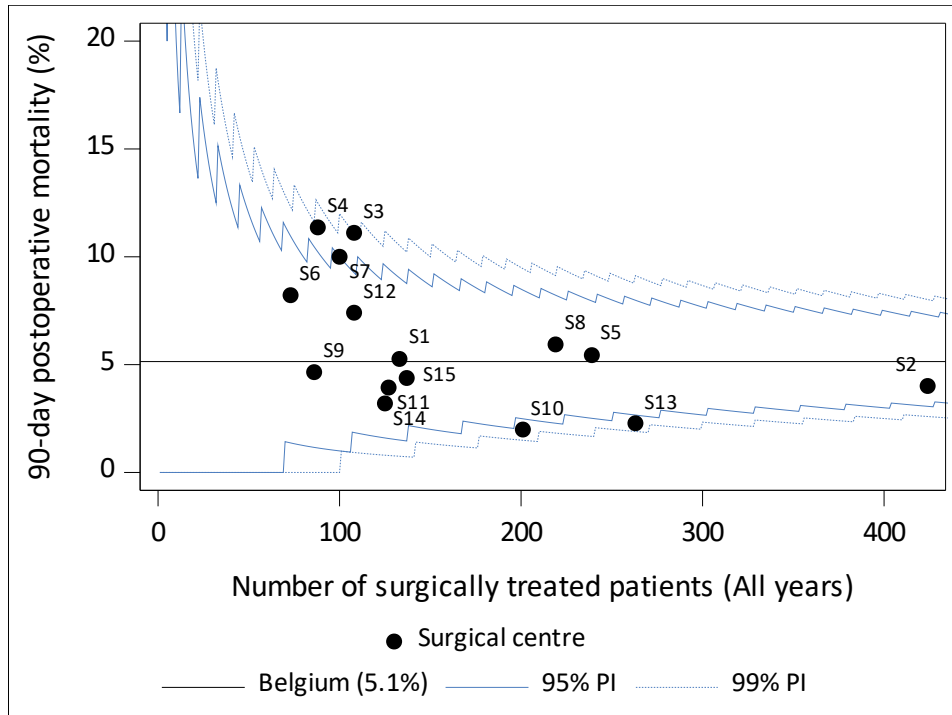
(b)



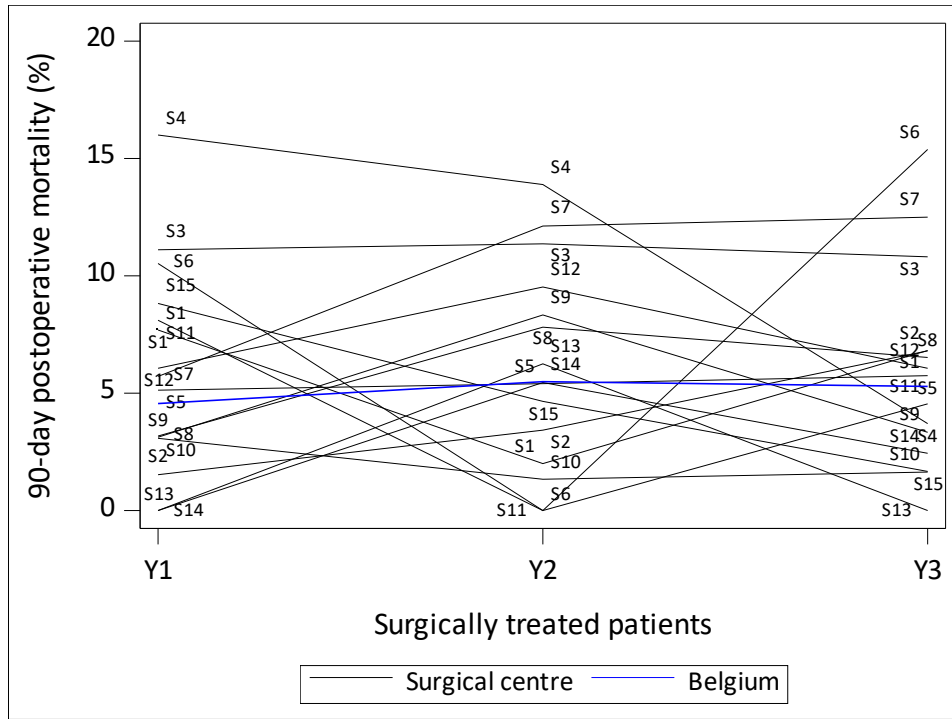
(c)



(d)



(e)



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 90-day postoperative mortality, for **benign and malignant tumoural** pathology, in the three convention years.

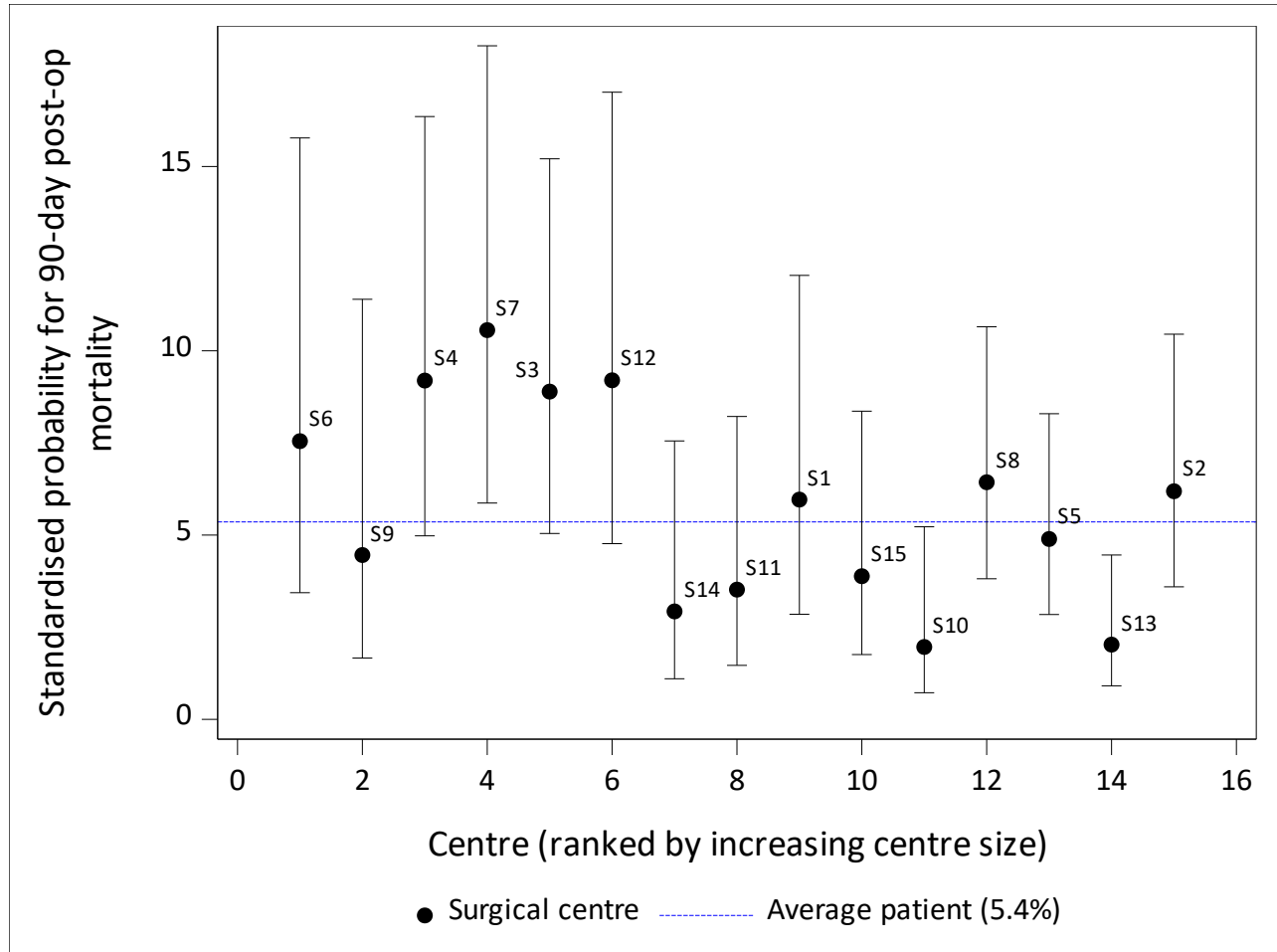
Expert centres	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	1.16	[0.53, 2.52]	1.05	6.0	[2.9, 12.0]	5.4
S2	1.21	[0.65, 2.24]	1.05	6.2	[3.6, 10.5]	5.4
S3	1.82	[0.97, 3.40]	1.05	8.9	[5.0, 15.2]	5.4
S4	1.89	[0.96, 3.71]	1.05	9.2	[5.0, 16.4]	5.4
S5	0.93	[0.52, 1.67]	1.05	4.9	[2.8, 8.3]	5.4
S6	1.51	[0.66, 3.46]	1.05	7.5	[3.4, 15.8]	5.4
S7	2.22	[1.15, 4.31]	1.05	10.6	[5.9, 18.3]	5.4
S8	1.26	[0.71, 2.23]	1.05	6.4	[3.8, 10.7]	5.4
S9	0.84	[0.31, 2.28]	1.05	4.5	[1.7, 11.4]	5.4
S10	0.36	[0.13, 0.94]	1.05	2.0	[0.7, 5.2]	5.4
S11	0.65	[0.27, 1.58]	1.05	3.5	[1.5, 8.2]	5.4
S12	1.89	[0.91, 3.90]	1.05	9.2	[4.8, 17.0]	5.4
S13	0.37	[0.17, 0.81]	1.05	2.0	[0.9, 4.5]	5.4
S14	0.54	[0.21, 1.42]	1.05	2.9	[1.1, 7.6]	5.4
S15	0.73	[0.32, 1.63]	1.05	3.9	[1.8, 8.4]	5.4

Adjusted for age at diagnosis, sex, ASA score, Charlson Comorbidity Index, type of surgery, vascular resection/reconstruction and tumor 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 and direct standardized result are weighted averages 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: Standardised probability for the 90-day postoperative mortality in the three convention years, by surgical centre.



3.3.2. Survival

Survival indicators 3 and 5 years after surgery cannot yet be calculated since there is only a limited number of patients with a 3-year follow-up after surgery at the time the report was made and no patients with a 5 year follow-up.

The vital status used in these analyses was determined on the 19th of October 2022.

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 three convention years.

Belgium					
Characteristic	N	N of deaths	Person Years	Hazard	95% CI
Overall Y1+Y2+Y3	2,431	406	2,030	0.20	[0.18, 0.22]
Expert centres					
S1	133	28	109	0.26	[0.17, 0.37]
S2	424	53	366	0.14	[0.11, 0.19]
S3	108	34	82	0.42	[0.29, 0.58]
S4	88	20	68	0.29	[0.18, 0.45]
S5	239	45	195	0.23	[0.17, 0.31]
S6	73	15	59	0.25	[0.14, 0.42]
S7	100	21	82	0.25	[0.16, 0.39]
S8	219	42	173	0.24	[0.17, 0.33]
S9	86	14	72	0.19	[0.11, 0.33]
S10	201	28	176	0.16	[0.11, 0.23]
S11	127	17	107	0.16	[0.09, 0.25]
S12	108	17	93	0.18	[0.11, 0.29]
S13	263	44	223	0.20	[0.14, 0.26]
S14	125	9	110	0.08	[0.04, 0.15]
S15	137	19	114	0.17	[0.10, 0.26]
Convention year					
Year 1	724	149	655	0.23	[0.19, 0.27]
Year 2	856	139	782	0.18	[0.15, 0.21]
Year 3	851	118	593	0.20	[0.16, 0.24]
Tumoural Pathology					
Adenocarcinoma	1,590	355	1,286	0.28	[0.25, 0.31]
Neuroendocrine tumour	302	15	260	0.06	[0.03, 0.10]
Benign tumour	373	11	339	0.03	[0.02, 0.06]
Other or unspecified	166	25	145	0.17	[0.11, 0.25]

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

Expert Centres	1-year observed survival after surgery, %											
	Year 1			Year 2			Year 3			Overall (Y1+Y2+Y3)		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	29	NA [*]	-	30	NA [*]	-	30	NA [*]	-	89	67.9	[56.1, 77.2]
S2	69	78.3	[66.6, 86.3]	81	85.0	[75.1, 91.2]	87	74.0	[60.4, 83.6]	237	79.6	[73.5, 84.4]
S3	19	NA [*]	-	36	NA [*]	-	27	NA [*]	-	82	61.4	[49.6, 71.3]
S4	14	NA [*]	-	26	NA [*]	-	19	NA [*]	-	59	67.0	[52.5, 77.9]
S5	59	79.7	[67.0, 87.9]	60	73.3	[60.2, 82.7]	56	72.0	[53.5, 84.1]	175	75.3	[67.8, 81.3]
S6	15	NA [*]	-	19	NA [*]	-	20	NA [*]	-	54	70.9	[55.6, 81.8]
S7	27	NA [*]	-	16	NA [*]	-	20	NA [*]	-	63	67.2	[53.8, 77.5]
S8	45	77.8	[62.6, 87.4]	43	69.8	[53.7, 81.2]	69	67.6	[50.4, 80.0]	157	71.3	[62.7, 78.3]
S9	21	NA [*]	-	15	NA [*]	-	14	NA [*]	-	50	72.4	[57.1, 83.0]
S10	41	65.9	[49.3, 78.2]	47	85.1	[71.3, 92.6]	36	NA [*]	-	124	78.4	[69.5, 85.0]
S11	27	NA [*]	-	25	NA [*]	-	29	NA [*]	-	81	78.3	[66.9, 86.2]
S12	22	NA [*]	-	24	NA [*]	-	21	NA [*]	-	67	78.9	[66.3, 87.2]
S13	46	78.3	[63.4, 87.7]	66	77.3	[65.2, 85.6]	63	77.8	[60.1, 88.4]	175	77.9	[70.6, 83.7]
S14	18	NA [*]	-	44	86.4	[72.1, 93.6]	30	NA [*]	-	92	90.6	[82.1, 95.2]
S15	24	NA [*]	-	26	NA [*]	-	35	NA [*]	-	85	78.7	[67.5, 86.5]

* N<40

Table 19. Unadjusted 1-year observed survival after surgery for **adenocarcinoma**, death by all causes, in the three convention years.

Characteristic	1-year observed survival after surgery, %		
	Belgium		
	N	%	95% CI
Overall Y1+Y2+Y3	1,590	75.5	[73.1, 77.6]
Convention year			
Year 1	476	73.1	[68.9, 76.8]
Year 2	558	78.6	[75.0, 81.8]
Year 3	556	74.1	[69.1, 78.4]
Sex			
Male	867	74.2	[70.9, 77.2]
Female	723	76.9	[73.5, 79.9]
Age at surgery			
<=69	842	81.2	[78.2, 83.8]
70-79	583	70.3	[66.1, 74.0]
>=80	165	64.3	[56.1, 71.4]
Lesion to treat (in (peri-)pancreas)			
Primary tumour	1,553	75.3	[72.9, 77.5]
Relapse of primary tumour	21	NA ^{KK}	-
Metastasis	16	NA ^{KK}	-
Primary tumour localisation			
C17.0 Duodenum	76	76.0	[64.1, 84.4]
C24.0 Extrahepatic bile duct	136	75.8	[67.1, 82.5]
C24.1 (Peri-) ampullary region	188	83.1	[76.6, 88.0]
C25.0 Head of pancreas	804	70.5	[67.0, 73.7]
C25.1 Body of pancreas	124	79.4	[70.4, 85.9]
C25.2 Tail of pancreas	145	88.3	[81.3, 92.8]
C25.3 Pancreatic duct	7	NA ^{KK}	-
C25.7-9 Other specified parts of pancreas	69	69.2	[56.3, 79.0]
Other	41	87.7	[73.0, 94.7]
Clinical stage			
0	14	NA ^{KK}	-
I	748	77.7	[74.4, 80.7]
II	449	70.5	[65.7, 74.7]
III	164	75.3	[67.5, 81.5]
IV	34	NA ^{KK}	-
X	160	79.7	[72.2, 85.4]

Characteristic	1-year observed survival after surgery, %		
	N	Belgium	
		%	95% CI
TNM not applicable or relapse*	21	NA ^{nk}	-
Pathological stage			
0	30	NA ^{nk}	-
I	271	85.2	[80.1, 89.1]
II	458	73.9	[69.4, 77.9]
III	420	70.9	[66.0, 75.1]
IV	46	57.4	[40.9, 70.8]
X	22	NA ^{nk}	-
TNM not applicable or relapse*	14	NA ^{nk}	-
Neoadjuvant treatment [†]	329	76.4	[70.9, 81.0]
yPathological stage			
0	9	NA ^{nk}	-
I	108	84.9	[75.3, 90.9]
II	111	76.9	[66.9, 84.2]
III	77	66.9	[54.3, 76.7]
IV	16	NA ^{nk}	-
X	1	NA ^{nk}	-
TNM not applicable or relapse*	7	NA ^{nk}	-
No neoadjuvant treatment	1,261	75.2	[72.6, 77.6]
Resection margin			
R0	1,119	78.7	[76.1, 81.1]
R1	467	67.6	[62.8, 72.0]
R2	4	NA ^{nk}	-
Prior surgery or other treatment **			
Prior abdominal surgery	246	76.4	[70.3, 81.4]
Other treatment modality (that could affect the pancreas)	255	75.5	[69.4, 80.5]
Neoadjuvant treatment			
Chemoradiotherapy	41	71.5	[53.3, 83.6]
Chemotherapy	286	77.3	[71.4, 82.1]
Radiotherapy	2	NA ^{nk}	-
No chemo or radiation treatment	1,261	75.2	[72.6, 77.6]
Charlson Comorbidity Index			
0	627	81.0	[77.5, 84.1]
1	385	72.6	[67.6, 77.0]
2	272	70.1	[63.8, 75.5]
3	127	78.1	[69.4, 84.5]
4	80	67.5	[55.1, 77.2]
5	39	NA ^{nk}	-

Characteristic	1-year observed survival after surgery, %		
	N	Belgium	
		%	95% CI
6	27	NA ^{KK}	-
7	16	NA ^{KK}	-
8	9	NA ^{KK}	-
9	6	NA ^{KK}	-
10	2	NA ^{KK}	-
WHO score at surgery			
0 - Asymptomatic, normal activity	373	81.8	[77.2, 85.6]
1 - Symptomatic, but ambulant	1,004	76.0	[73.1, 78.7]
2 - Symptomatic, bedbound < 50% day	176	63.7	[55.6, 70.8]
3 - Symptomatic, bedbound > 50% day	35	NA ^{KK}	-
4 - Completely dependent, 100% bedbound	2	NA ^{KK}	-
ASA score			
1 - Healthy person	108	83.0	[74.0, 89.1]
2 - Mild systemic disease, normal activity	834	77.8	[74.6, 80.6]
3 - Serious systemic disease, limited activity	627	71.4	[67.4, 75.0]
4 - Life-threatening illness, handicapped	21	NA ^{KK}	-
Resectability status ^{##}			
Before neoadjuvant treatment			
Upfront resectable	40	82.1	[60.5, 92.6]
Borderline resectable	112	81.3	[71.0, 88.3]
Unresectable	37	NA ^{KK}	-
No neoadjuvant treatment	685	77.4	[73.7, 80.6]
Before surgery			
Upfront resectable	725	77.2	[73.6, 80.4]
Borderline resectable	138	82.5	[73.9, 88.4]
Unresectable	5	NA ^{KK}	-
Missing	6	NA ^{KK}	-
Type of surgery			
Minimally invasive surgery (MIS) – Laparoscopic	352	82.0	[77.2, 85.9]
Minimally invasive surgery (MIS) - Hybrid	1	NA ^{KK}	-
Minimally invasive surgery (MIS) - Robotic	85	77.6	[66.2, 85.5]
Open	1,074	73.7	[70.8, 76.3]
Conversion from MIS to open surgery	78	69.9	[57.8, 79.1]
Simultaneous venous resection			
No	1,315	78.5	[76.0, 80.7]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	275	61.0	[54.5, 66.9]
- With primary wedge-reconstruction	82	57.4	[45.0, 68.1]

1-year observed survival after surgery, %			
Belgium			
Characteristic	N	%	95% CI
- With primary end-to-end reconstruction	135	62.6	[53.2, 70.6]
- With vascular autograft interposition	6	NA [Ⓜ]	-
- With vascular allograft interposition	17	NA [Ⓜ]	-
- With synthetic/prosthetic interposition	4	NA [Ⓜ]	-
- With peritoneal patch wedge-reconstruction	28	NA [Ⓜ]	-
- Without reconstruction	3	NA [Ⓜ]	-
<i>Simultaneous arterial resection **</i>			
No	1,548	75.3	[72.9, 77.5]
Hepatic artery resection	17	NA [Ⓜ]	-
- With primary end-to-end reconstruction	11	NA [Ⓜ]	-
- With vascular allograft interposition	1	NA [Ⓜ]	-
- Without reconstruction	5	NA [Ⓜ]	-
Coeliac trunk resection	20	NA [Ⓜ]	-
- With primary end-to-end reconstruction	1	NA [Ⓜ]	-
- Without reconstruction	19	NA [Ⓜ]	-
Superior mesenteric artery (SMA) resection	4	NA [Ⓜ]	-
- With primary wedge-reconstruction	1	NA [Ⓜ]	-
- With primary end-to-end reconstruction	1	NA [Ⓜ]	-
- With vascular autograft interposition	2	NA [Ⓜ]	-
<i>Simultaneous other organ resection **</i>			
No	985	74.3	[71.3, 77.1]
Colon	46	65.8	[49.8, 77.8]
Stomach	279	77.3	[71.5, 82.1]
Adrenal gland	38	NA [Ⓜ]	-
Spleen	257	81.1	[75.3, 85.6]
Other	109	73.0	[63.3, 80.5]
<i>RIZIV code for complex surgery</i>			
242830-242841: Pancreaticoduodenectomy	1,285	73.4	[70.7, 75.9]
Pancreaticoduodenectomy	1,197	74.2	[71.5, 76.7]
Total Pancreatectomy	88	62.6	[51.1, 72.1]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	106	81.9	[72.7, 88.2]
242874-242885: Hemipancreatectomy left	197	86.3	[80.2, 90.7]
242896-242900: Enucleation of a pancreatic tumour	2	NA [Ⓜ]	-
<i>Antithrombotic medication</i>			
No	1,091	77.3	[74.5, 79.8]
Yes	499	71.5	[67.1, 75.4]

Characteristic	1-year observed survival after surgery, %		
	Belgium		
	N	%	95% CI
<i>Was the patient referred?</i>			
No	652	76.4	[72.7, 79.7]
Yes	938	74.8	[71.7, 77.6]

* 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.

* N<40

3.3.2.2. Unadjusted relative survival after surgery for adenocarcinoma

Table 20: Unadjusted 1-year relative survival after surgery for **adenocarcinoma**, death by all causes, per individual expert centre.

Expert Centres	1-year observed survival after surgery, %											
	Year 1			Year 2			Year 3			Overall (Y1+Y2+Y3)		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
S1	29	NA [Ⓜ]	-	30	NA [Ⓜ]	-	30	NA [Ⓜ]	-	89	72.3	[60.9, 81.1]
S2	69	80.0	[68.3, 88.1]	81	86.4	[76.3, 92.7]	87	75.9	[63.5, 84.8]	237	81.1	[75.0, 85.9]
S3	19	NA [Ⓜ]	-	36	NA [Ⓜ]	-	27	NA [Ⓜ]	-	82	62.6	[50.6, 72.6]
S4	14	NA [Ⓜ]	-	26	NA [Ⓜ]	-	19	NA [Ⓜ]	-	59	67.3	[52.7, 78.5]
S5	59	81.7	[68.9, 90.0]	60	75.0	[61.5, 84.6]	56	74.5	[58.2, 85.7]	175	77.4	[69.8, 83.4]
S6	15	NA [Ⓜ]	-	19	NA [Ⓜ]	-	20	NA [Ⓜ]	-	54	73.0	[57.8, 83.8]
S7	27	NA [Ⓜ]	-	16	NA [Ⓜ]	-	20	NA [Ⓜ]	-	63	68.4	[54.8, 79.0]
S8	45	NA [Ⓜ]	-	43	NA [Ⓜ]	-	69	70.4	[55.7, 81.3]	157	74.0	[65.7, 80.8]
S9	21	NA [Ⓜ]	-	15	NA [Ⓜ]	-	14	NA [Ⓜ]	-	50	74.3	[59.1, 84.8]
S10	41	NA [Ⓜ]	-	47	NA [Ⓜ]	-	36	NA [Ⓜ]	-	124	81.4	[72.8, 87.8]
S11	27	NA [Ⓜ]	-	25	NA [Ⓜ]	-	29	NA [Ⓜ]	-	81	80.1	[68.5, 88.2]
S12	22	NA [Ⓜ]	-	24	NA [Ⓜ]	-	21	NA [Ⓜ]	-	67	81.3	[69.0, 89.3]
S13	46	NA [Ⓜ]	-	66	79.1	[66.7, 87.7]	63	81.9	[67.5, 90.8]	175	80.4	[73.2, 86.1]
S14	18	NA [Ⓜ]	-	44	NA [Ⓜ]	-	30	NA [Ⓜ]	-	92	92.9	[84.2, 97.6]
S15	24	NA [Ⓜ]	-	26	NA [Ⓜ]	-	35	NA [Ⓜ]	-	85	81.6	[70.7, 89.2]

[Ⓜ] N<50

Table 21. Unadjusted 1-year relative survival after surgery for **adenocarcinoma**, death by all causes, in the three convention years.

Characteristic	1-year relative survival after surgery, %		
	N	Belgium	
		%	95% CI
Overall Y1+Y2+Y3	1,590	77.7	[75.3, 79.8]
Convention year			
Year 1	476	75.2	[70.9, 78.9]
Year 2	558	80.5	[76.8, 83.7]
Year 3	556	76.8	[72.3, 80.7]
Sex			
Male	867	76.8	[73.6, 79.8]
Female	723	78.6	[75.2, 81.6]
Age at surgery			
<=69	842	82.6	[79.7, 85.2]
70-79	583	72.8	[68.6, 76.5]
>=80	165	67.9	[59.1, 75.5]
Lesion to treat (in (peri-)pancreas)			
Primary tumour	1,553	77.5	[75.2, 79.7]
Relapse of primary tumour	21	NA ^{KK}	-
Metastasis	16	NA ^{KK}	-
Primary tumour localisation			
C17.0 Duodenum	76	77.4	[65.2, 86.2]
C24.0 Extrahepatic bile duct	136	78.1	[69.4, 84.9]
C24.1 (Peri-) ampullary region	188	84.9	[78.1, 90.0]
C25.0 Head of pancreas	804	72.9	[69.5, 76.1]
C25.1 Body of pancreas	124	81.5	[72.7, 87.9]
C25.2 Tail of pancreas	145	90.6	[83.9, 95.0]
C25.3 Pancreatic duct	7	NA ^{KK}	-
C25.7-9 Other specified parts of pancreas	69	72.3	[59.7, 81.8]
Other	41	NA ^{KK}	-
Clinical stage			
0	14	NA ^{KK}	-
I	748	80.0	[76.7, 83.0]
II	449	72.9	[68.2, 77.0]
III	164	76.9	[69.1, 83.1]
IV	34	NA ^{KK}	-
X	160	81.8	[74.4, 87.5]
TNM not applicable or relapse*	21	NA ^{KK}	-

Characteristic	1-year relative survival after surgery, %		
	N	Belgium	
		%	95% CI
Pathological stage			
0	30	NA ^{KK}	-
I	271	87.3	[82.2, 91.3]
II	458	76.0	[71.4, 80.0]
III	420	72.3	[67.4, 76.6]
IV	46	NA ^{KK}	-
X	22	NA ^{KK}	-
TNM not applicable or relapse*	14	NA ^{KK}	-
Neoadjuvant treatment [†]	329	80.1	[75.0, 84.3]
yPathological stage			
0	9	NA ^{KK}	-
I	108	88.2	[79.7, 93.6]
II	111	79.7	[70.1, 86.6]
III	77	72.0	[60.5, 80.8]
IV	16	NA ^{KK}	-
X	1	NA ^{KK}	-
TNM not applicable or relapse*	7	NA ^{KK}	-
No neoadjuvant treatment	1,261	77.0	[74.3, 79.4]
Resection margin			
R0	1,119	80.7	[78.0, 83.1]
R1	467	70.7	[66.1, 74.9]
R2	4	NA ^{KK}	-
Prior surgery or other treatment **			
Prior abdominal surgery	246	77.8	[71.5, 83.0]
Other treatment modality (that could affect the pancreas)	255	77.1	[70.9, 82.3]
Neoadjuvant treatment			
Chemoradiotherapy	41	NA ^{KK}	-
Chemotherapy	286	80.8	[75.4, 85.2]
Radiotherapy	2	NA ^{KK}	-
No chemo or radiation treatment	1,261	77.0	[74.3, 79.4]
Charlson Comorbidity Index			
0	627	83.4	[80.0, 86.4]
1	385	74.3	[69.2, 78.7]
2	272	72.6	[66.4, 78.0]
3	127	80.4	[71.7, 86.9]
4	80	71.4	[59.3, 80.7]
5	39	NA ^{KK}	-
6	27	NA ^{KK}	-
7	16	NA ^{KK}	-

1-year relative survival after surgery, %			
Characteristic	N	Belgium	
		%	95% CI
8	9	NA ^{KK}	-
9	6	NA ^{KK}	-
10	2	NA ^{KK}	-
WHO score at surgery			
0 - Asymptomatic, normal activity	373	84.0	[79.5, 87.6]
1 - Symptomatic, but ambulant	1,004	78.3	[75.4, 81.0]
2 - Symptomatic, bedbound < 50% day	176	65.4	[57.2, 72.5]
3 - Symptomatic, bedbound > 50% day	35	NA ^{KK}	-
4 - Completely dependent, 100% bedbound	2	NA ^{KK}	-
ASA score			
1 - Healthy person	108	84.6	[75.7, 90.6]
2 - Mild systemic disease, normal activity	834	80.0	[76.9, 82.8]
3 - Serious systemic disease, limited activity	627	73.7	[69.7, 77.3]
4 - Life-threatening illness, handicapped	21	NA ^{KK}	-
Resectability status ^{##}			
Before neoadjuvant treatment			
Upfront resectable	40	NA ^{KK}	-
Borderline resectable	112	85.1	[76.0, 91.1]
Unresectable	37	NA ^{KK}	-
No neoadjuvant treatment	685	78.5	[74.7, 81.8]
Before surgery			
Upfront resectable	725	78.7	[75.1, 81.9]
Borderline resectable	138	85.1	[77.2, 90.6]
Unresectable	5	NA ^{KK}	-
Missing	6	NA ^{KK}	-
Type of surgery			
Minimally invasive surgery (MIS) – Laparoscopic	352	84.3	[79.7, 88.1]
Minimally invasive surgery (MIS) - Hybrid	1	NA ^{KK}	-
Minimally invasive surgery (MIS) - Robotic	85	79.8	[68.5, 87.8]
Open	1,074	76.0	[73.1, 78.6]
Conversion from MIS to open surgery	78	69.8	[57.2, 79.6]
Simultaneous venous resection			
No	1,315	80.5	[78.1, 82.8]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	275	64.6	[58.4, 70.1]
- With primary wedge-reconstruction	82	61.6	[49.7, 71.6]
- With primary end-to-end reconstruction	135	65.4	[56.4, 73.1]
- With vascular autograft interposition	6	NA ^{KK}	-
- With vascular allograft interposition	17	NA ^{KK}	-

Characteristic	1-year relative survival after surgery, %		
	N	Belgium	
		%	95% CI
- With synthetic/prosthetic interposition	4	NA ^{AK}	-
- With peritoneal patch wedge-reconstruction	28	NA ^{AK}	-
- Without reconstruction	3	NA ^{AK}	-
Simultaneous arterial resection **			
No	1,548	77.5	[75.1, 79.7]
Hepatic artery resection	17	NA ^{AK}	-
- With primary end-to-end reconstruction	11	NA ^{AK}	-
- With vascular allograft interposition	1	NA ^{AK}	-
- Without reconstruction	5	NA ^{AK}	-
Coeliac trunk resection	20	NA ^{AK}	-
- With primary end-to-end reconstruction	1	NA ^{AK}	-
- Without reconstruction	19	NA ^{AK}	-
Superior mesenteric artery (SMA) resection	4	NA ^{AK}	-
- With primary wedge-reconstruction	1	NA ^{AK}	-
- With primary end-to-end reconstruction	1	NA ^{AK}	-
- With vascular autograft interposition	2	NA ^{AK}	-
Simultaneous other organ resection **			
No	985	76.5	[73.5, 79.2]
Colon	46	NA ^{AK}	-
Stomach	279	79.1	[73.3, 84.0]
Adrenal gland	38	NA ^{AK}	-
Spleen	257	83.3	[77.7, 87.8]
Other	109	76.0	[66.5, 83.4]
RIZIV code for complex surgery			
242830-242841: Pancreaticoduodenectomy	1,285	75.7	[73.0, 78.1]
Pancreaticoduodenectomy	1,197	76.6	[73.8, 79.1]
Total Pancreatectomy	88	63.7	[52.2, 73.4]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	106	83.4	[74.1, 89.8]
242874-242885: Hemipancreatectomy left	197	88.4	[82.5, 92.7]
242896-242900: Enucleation of a pancreatic tumour	2	NA ^{AK}	-
Antithrombotic medication			
No	1,091	79.4	[76.7, 81.9]
Yes	499	73.6	[69.1, 77.7]
Was the patient referred?			
No	652	78.5	[74.9, 81.8]
Yes	938	77.1	[74.0, 79.8]

Characteristic	1-year relative survival after surgery, %		
	N	Belgium	
		%	95% CI

* 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.

‡ N<50

3.3.3. Proportion of surgically treated patients with resection margin R0, R1, R2

Table 22. Proportion of surgically treated patients with **pancreatic ductal adenocarcinoma** in the three convention years with resection margin R0, R1 and R2.

Resection margin	N	Belgium		
		n	n/N (%)	95% CI
Total surgically treated patients with pancreatic ductal adenocarcinoma	858			
Convention year				
Year 1	245			
Year 2	322			
Year 3	291			
Resection margin status				
R0	858	569	66.3	[63.0, 69.5]
- With simultaneous vascular resection		105		
- Without simultaneous vascular resection		464		
R1 indirect	858	203	23.7	[20.9, 26.6]
- With simultaneous vascular resection		57		
- Without simultaneous vascular resection		146		
R1 direct	858	83	9.7	[7.8, 11.9]
- With simultaneous vascular resection		31		
- Without simultaneous vascular resection		52		
R2	858	3	0.3	[0.1, 1.0]
- With simultaneous vascular resection		1		
- Without simultaneous vascular resection		2		

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

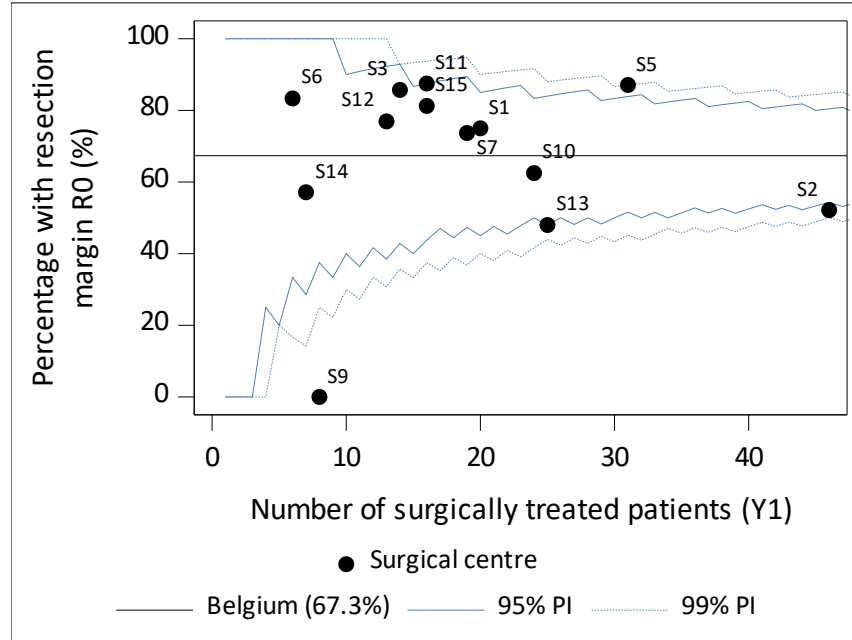
Remark: Enucleation is regarded as a R1 resection

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 (N=5)

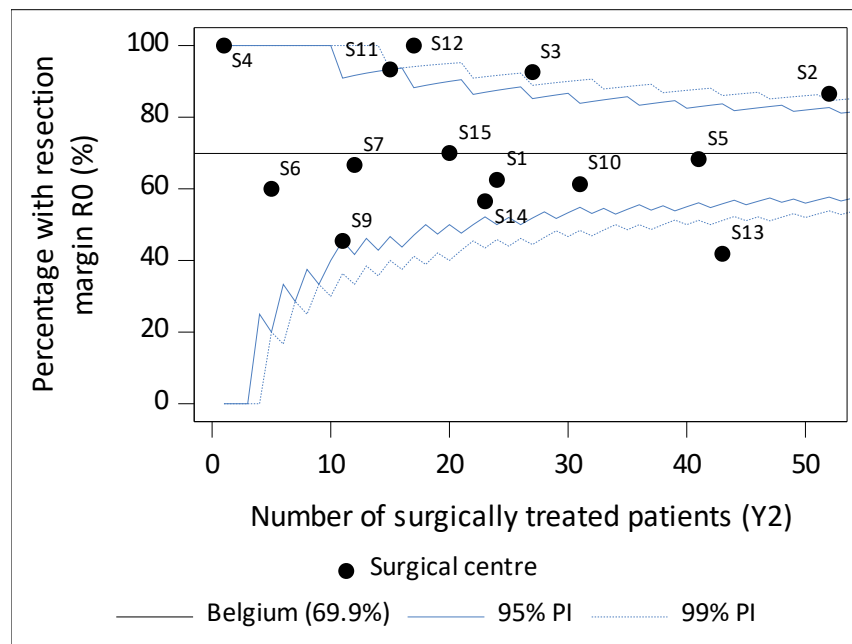
Figure 18: Funnel and spaghetti plot of the proportion of surgically treated patients with **pancreatic ductal adenocarcinoma** with resection margin **R0**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

(a)



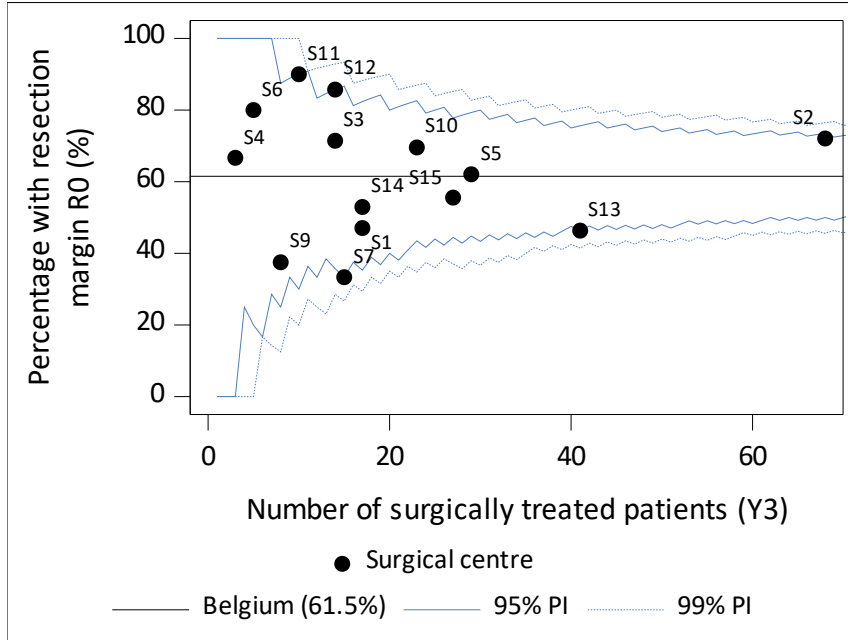
N=2 hospitals are not displayed in the graph above because they had no patients for the current selection.

(b)



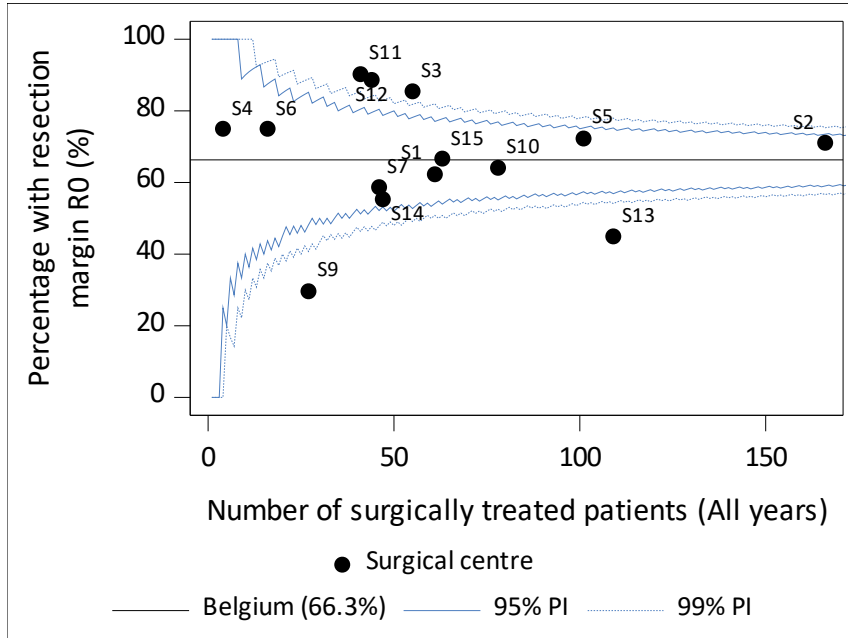
N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(c)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(d)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(e)

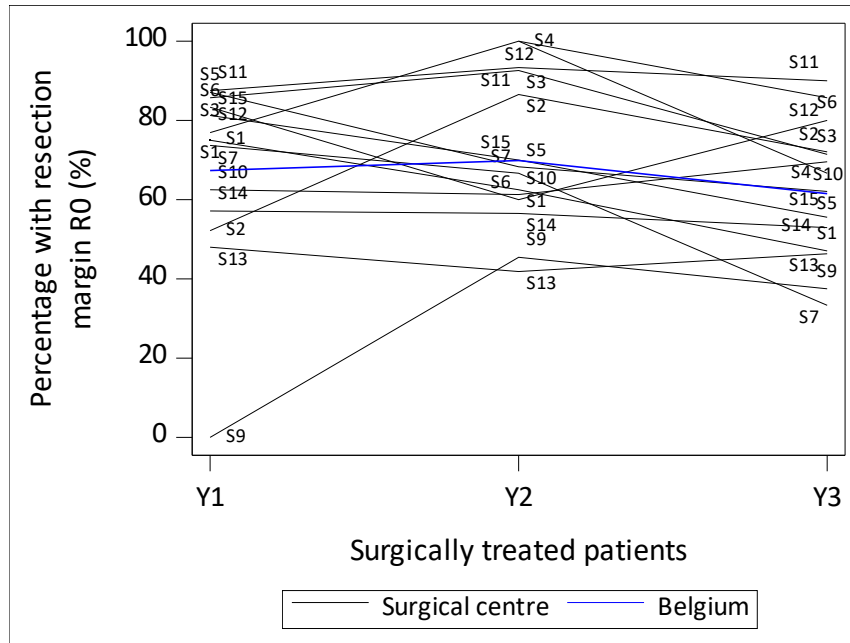
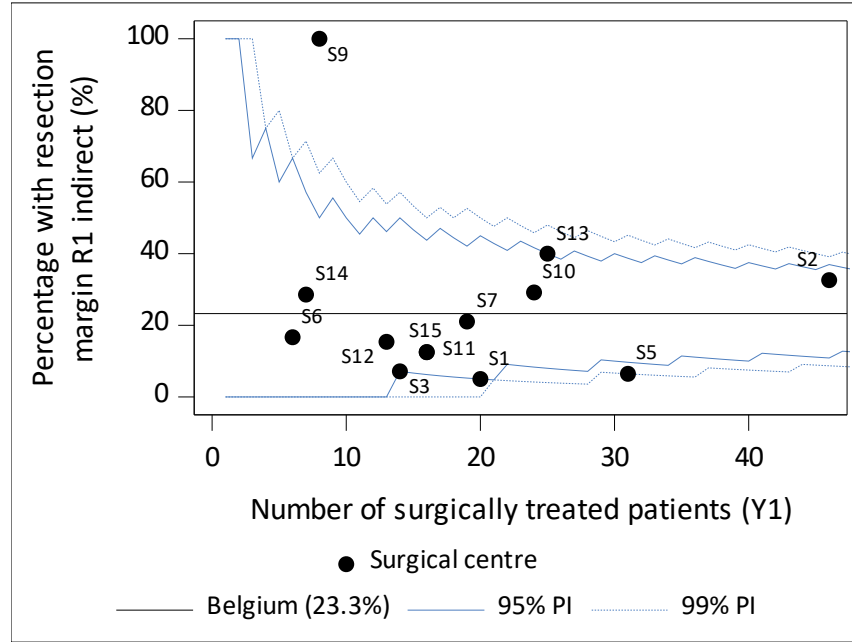


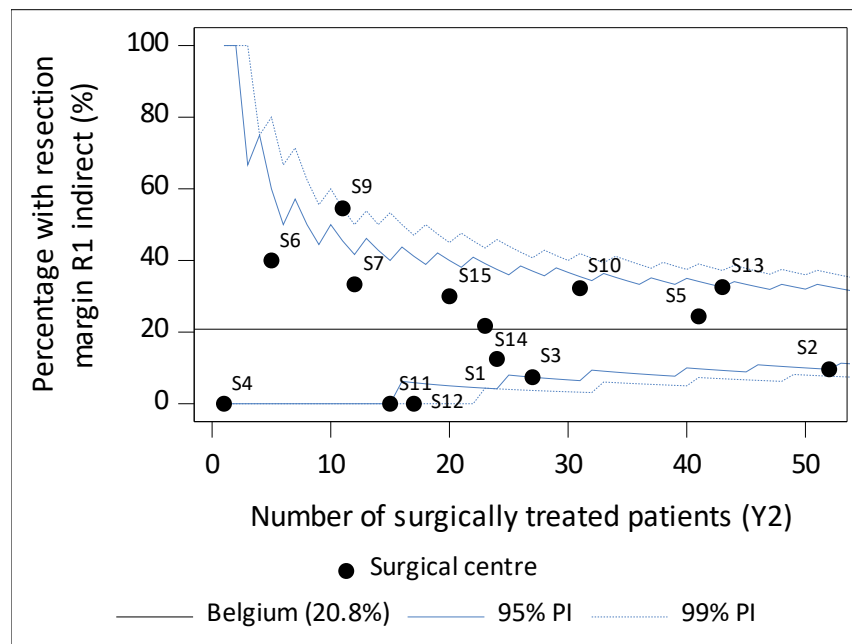
Figure 19: Funnel and spaghetti plot of the proportion of surgically treated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 indirect**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

(a)



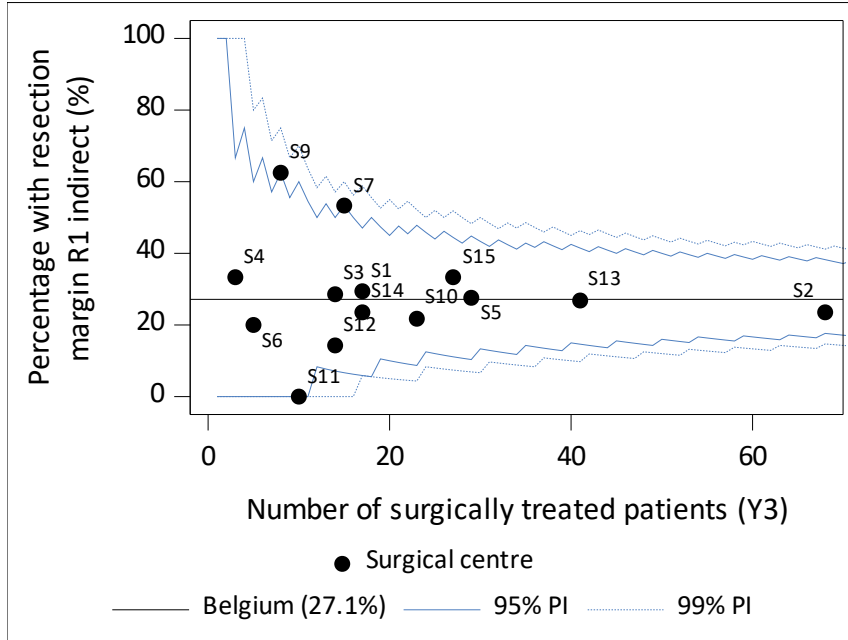
N=2 hospitals are not displayed in the graph above because they had no patients for the current selection.

(b)



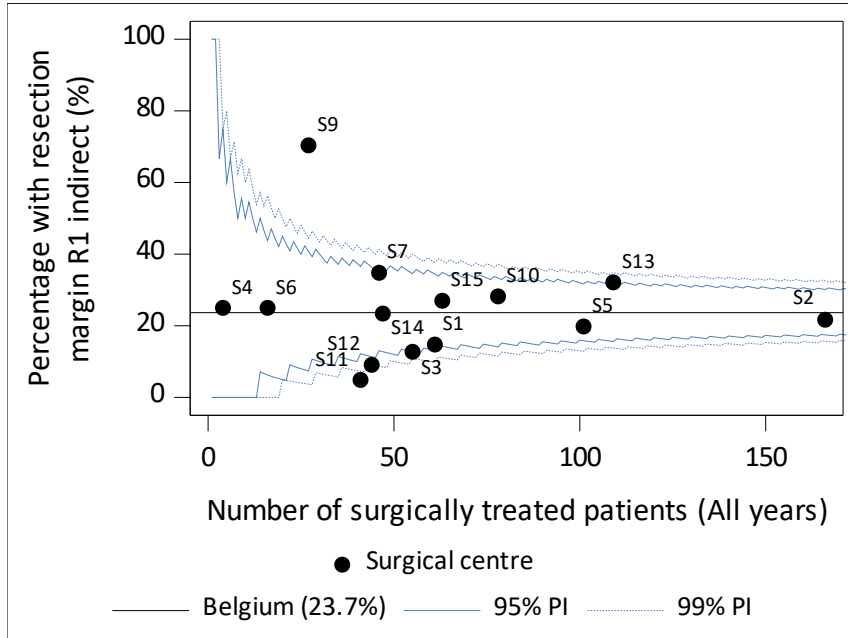
N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(c)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(d)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(e)

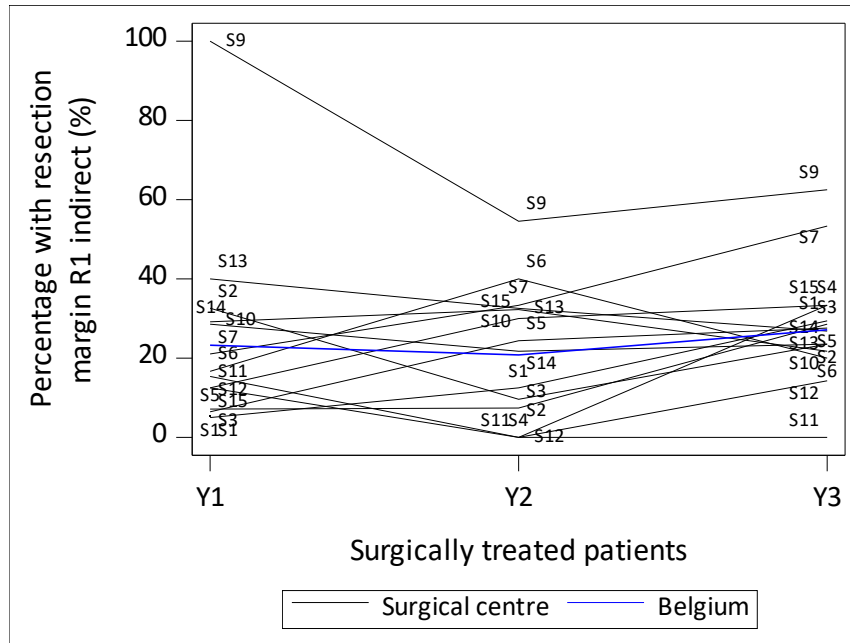
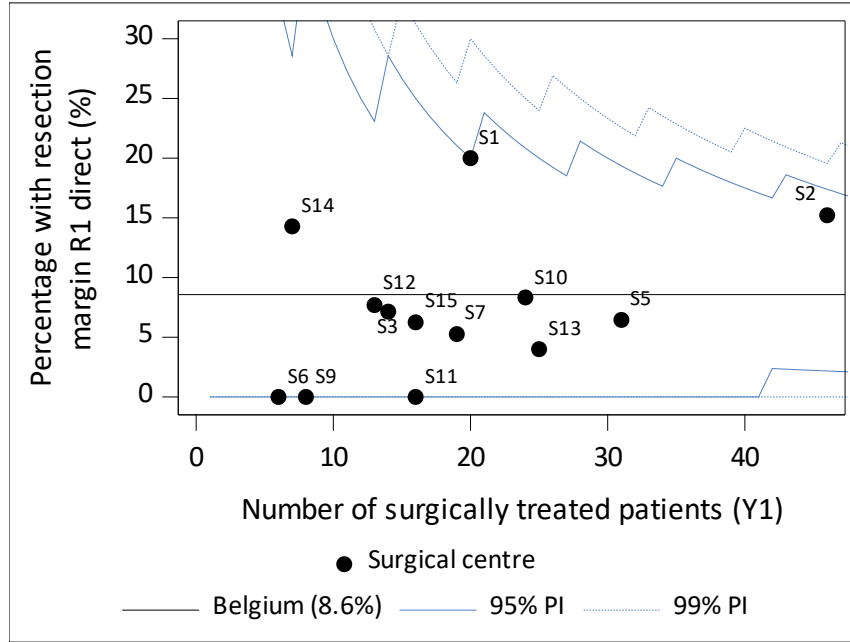


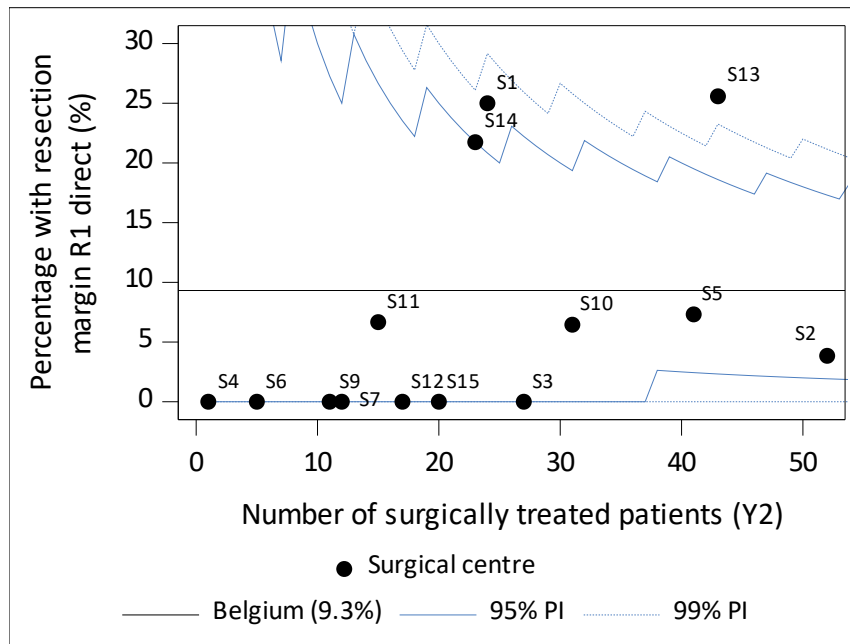
Figure 20: Funnel and spaghetti plot of the proportion of surgically treated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 direct**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

(a)



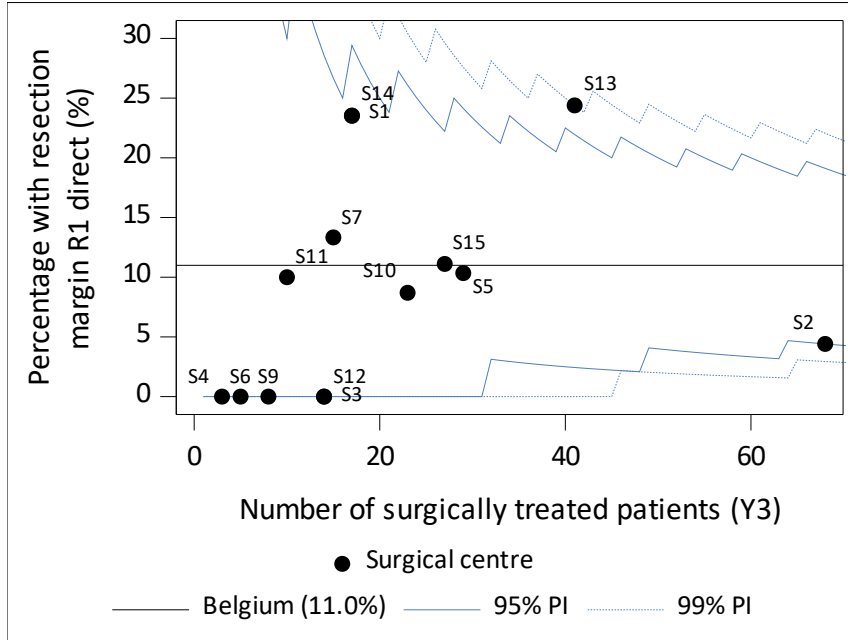
N=2 hospitals are not displayed in the graph above because they had no patients for the current selection.

(b)



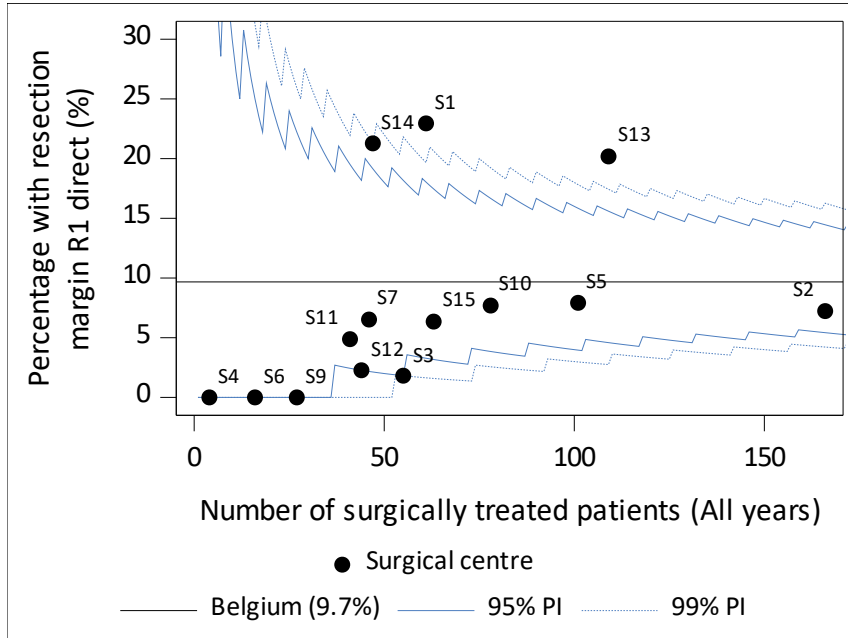
N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(c)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(d)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(e)

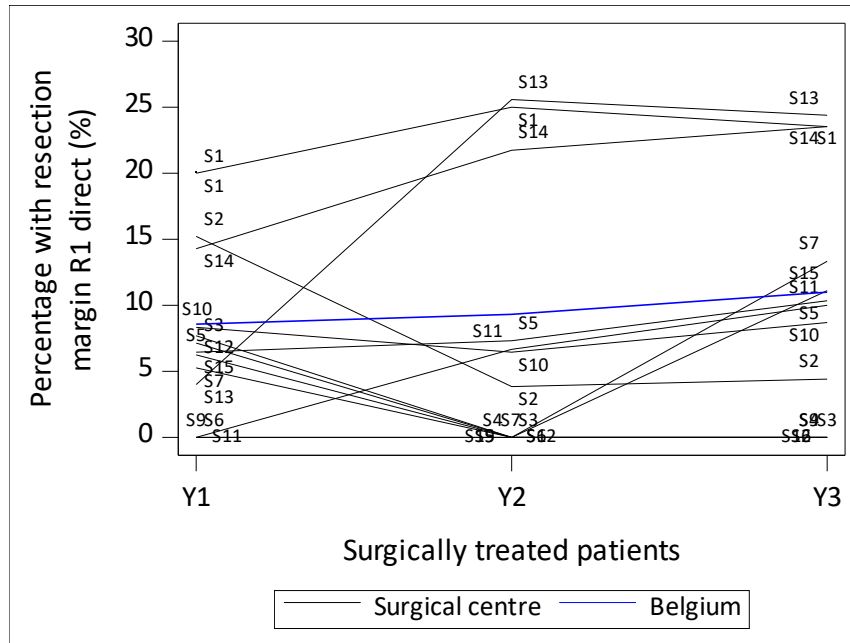
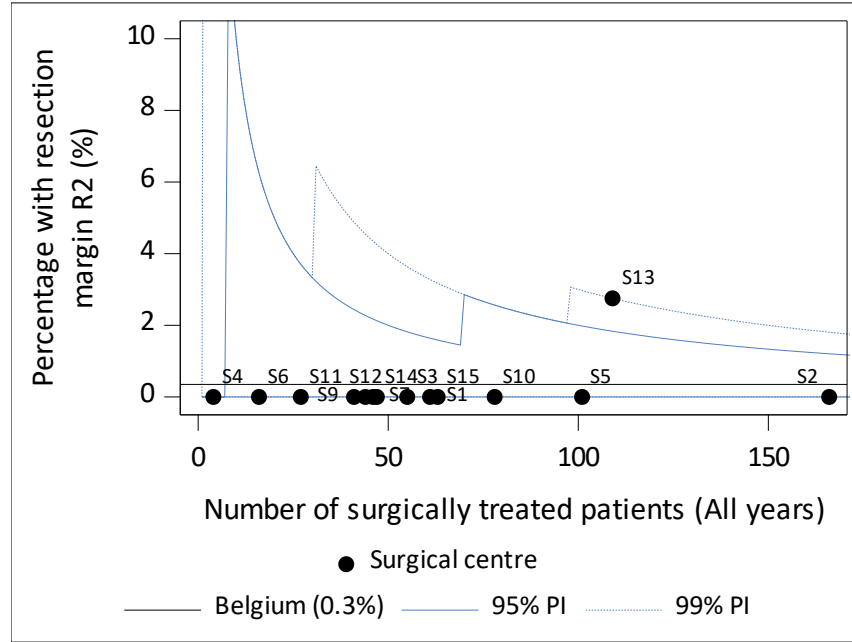


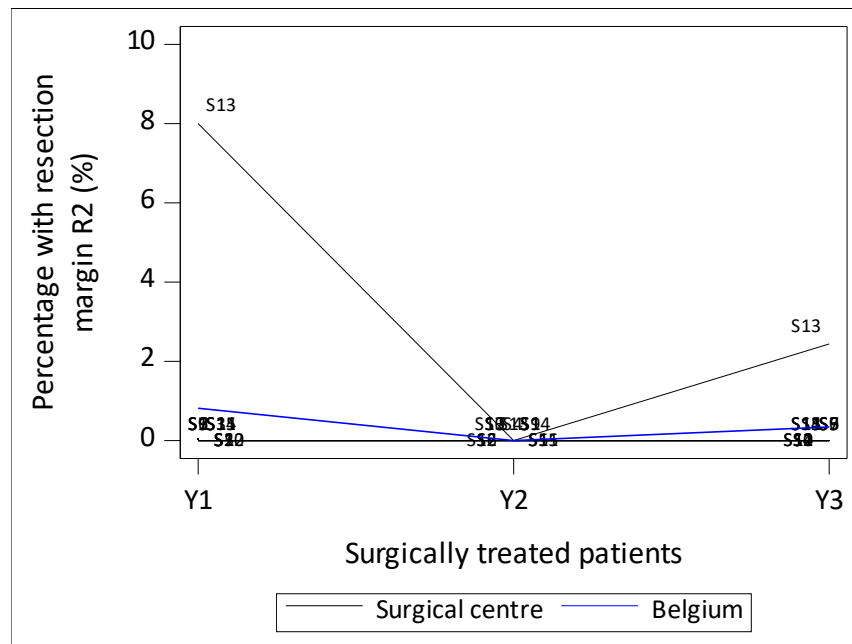
Figure 21: Funnel and spaghetti plot of the proportion of surgically treated patients with **pancreatic ductal adenocarcinoma** with resection margin **R2**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



N=1 hospital is not displayed in the graph above because it had no patients for the current selection.

(b)



3.3.4. Proportion of surgically treated 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 23. Proportion of surgically treated patients (**malignant and benign tumours**) in the three convention years with surgical complications (90-day postoperative, in-hospital), by complication type.

Complication type	Postoperative complications (90-day in-hospital)			
	Belgium			
	N	n	n/N (%)	95% CI
<i>Severe postoperative complications (CD IIIb-V)</i>	2,431	337	13.9	[12.5, 15.3]
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]
<i>Clinically relevant pancreatic fistula (Grade B or C) ^{1*}</i>	2,431	469	19.3	[17.7, 20.9]
Grade B	2,431	413	17.0	[15.5, 18.5]
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]
Grade C	2,431	56	2.3	[1.7, 3.0]
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]
<i>Haemorrhage (Grade A, B or C) ^{2*}</i>	2,431	212	8.7	[7.6, 9.9]
Grade A	2,431	46	1.9	[1.4, 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]
Grade B	2,431	95	3.9	[3.2, 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]
Grade C	2,431	71	2.9	[2.3, 3.7]
Year 1	724	25	3.5	[2.2, 5.1]
Year 2	856	23	2.7	[1.7, 4.0]
Year 3	851	23	2.7	[1.7, 4.0]
<i>Delayed gastric emptying (Grade A, B or C) ^{3*}</i>	2,431	385	15.8	[14.4, 17.3]
Grade A	2,431	190	7.8	[6.8, 9.0]
Year 1	724	50	6.9	[5.2, 9.0]
Year 2	856	75	8.8	[7.0, 10.9]
Year 3	851	65	7.6	[5.9, 9.6]
Grade B	2,431	136	5.6	[4.7, 6.6]
Year 1	724	42	5.8	[4.2, 7.8]

Postoperative complications (90-day in-hospital)					
Belgium					
Complication type	N	n	n/N (%)	95% CI	
Year 2	856	42	4.9	[3.6, 6.6]	
Year 3	851	52	6.1	[4.6, 7.9]	
Grade C	2,431	59	2.4	[1.9, 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]	
Bile leakage (Grade A, B or C) ^{4*}	2,431	75	3.1	[2.4, 3.9]	
Grade A	2,431	27	1.1	[0.7, 1.6]	
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]	
Grade B	2,431	24	1.0	[0.6, 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]	
Grade C	2,431	24	1.0	[0.6, 1.5]	
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]	
Intra-abdominal abscess [*]	2,431	142	5.8	[4.9, 6.8]	
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]	
Transferred to another hospital due to complications (CD I-IVb)	2,431	2	0.1	[0.0, 0.3]	
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]	

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

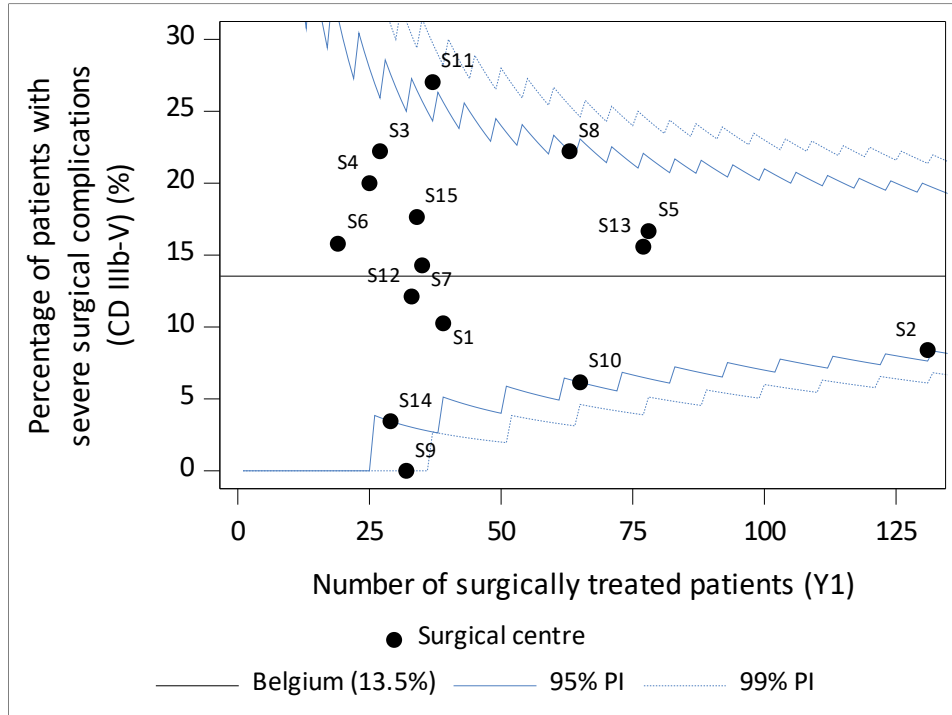
⁴ graded according to the International Study Group of Liver Surgery (ISGLS)

More information can be found in the project manual.

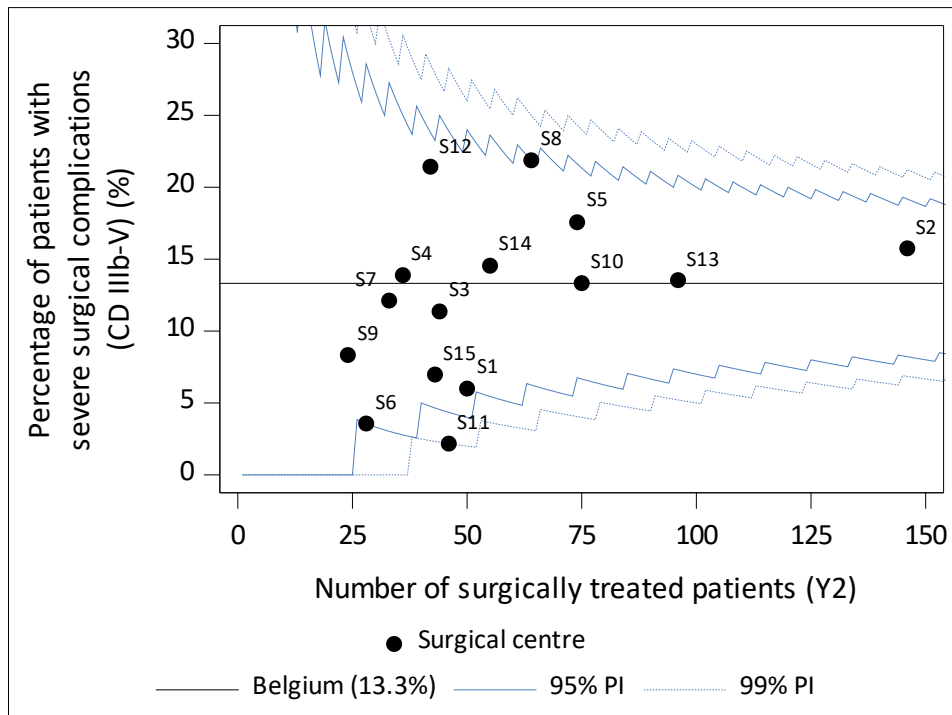
* Patients could have a combination of complications, thus the total number of complications could be larger than the total number of patients.

Figure 22: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **severe surgical complications** (CD IIIb-V), per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

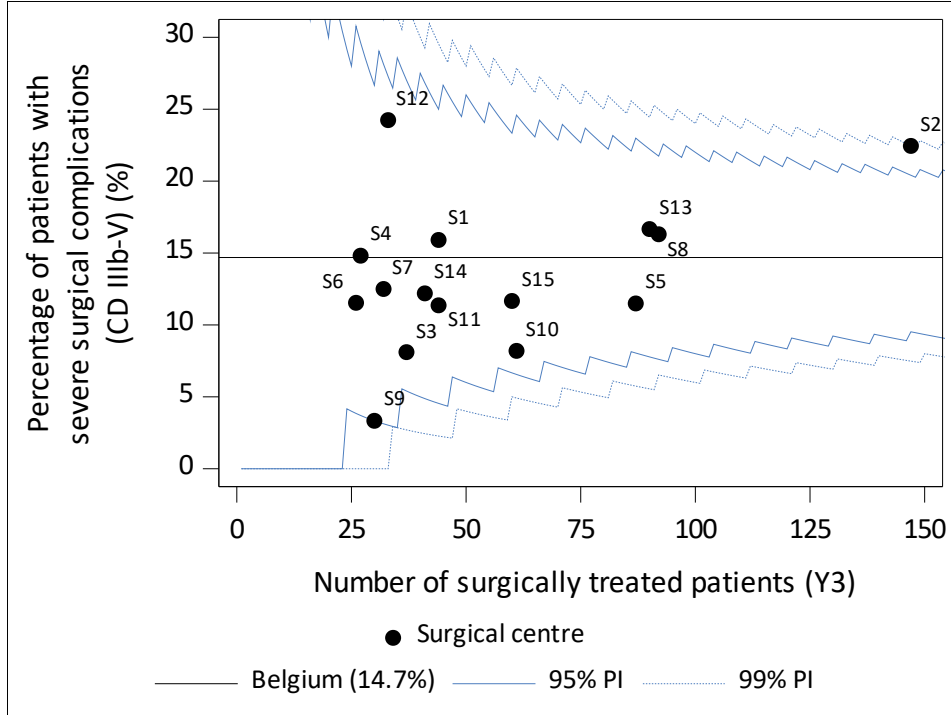
(a)



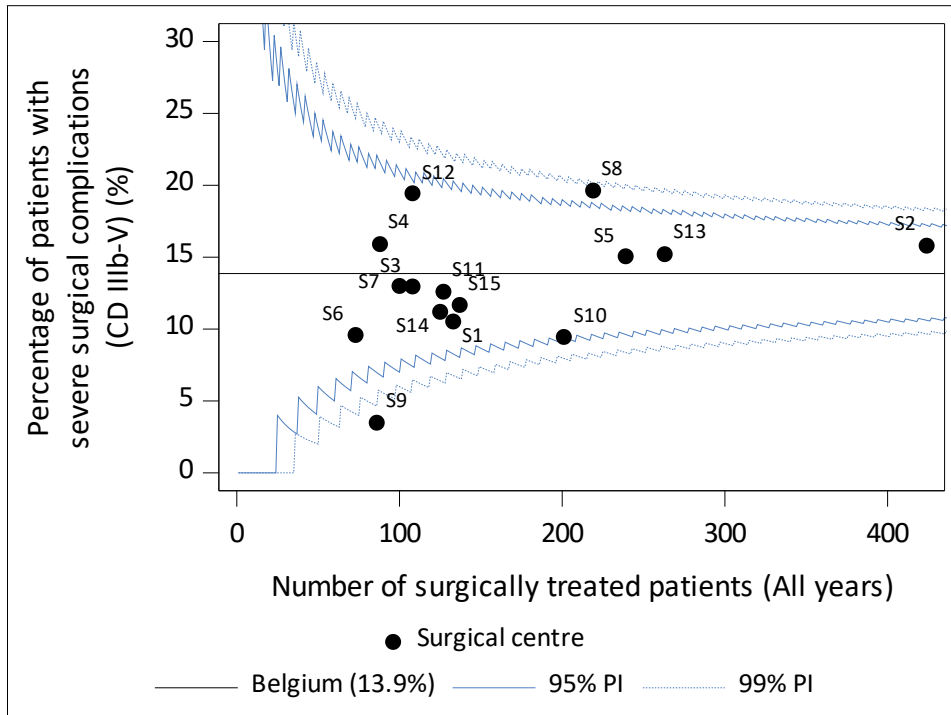
(b)



(c)



(d)



(e)

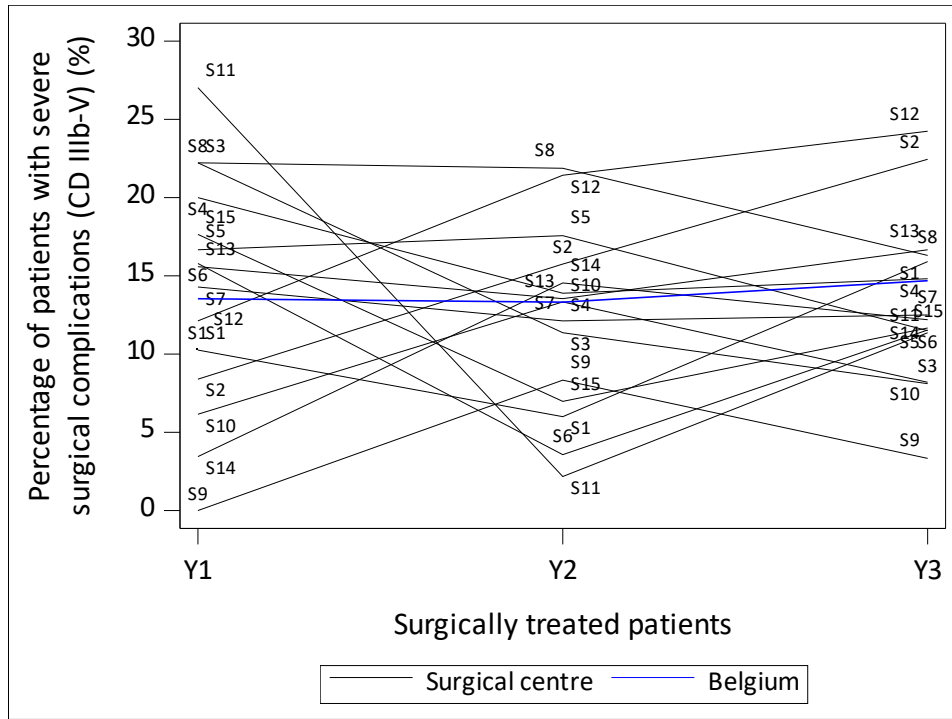
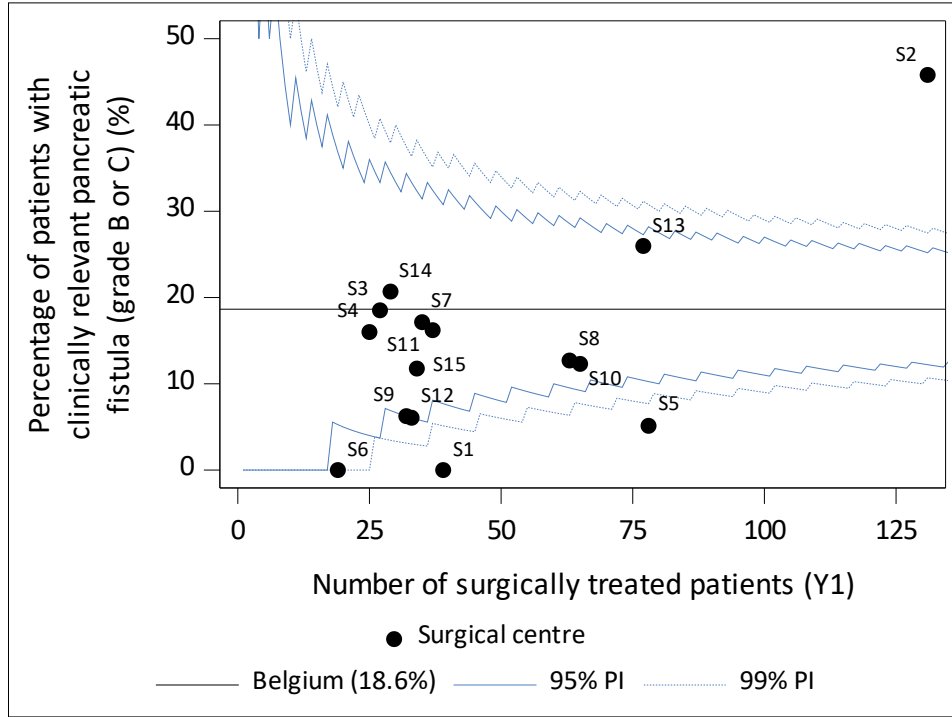
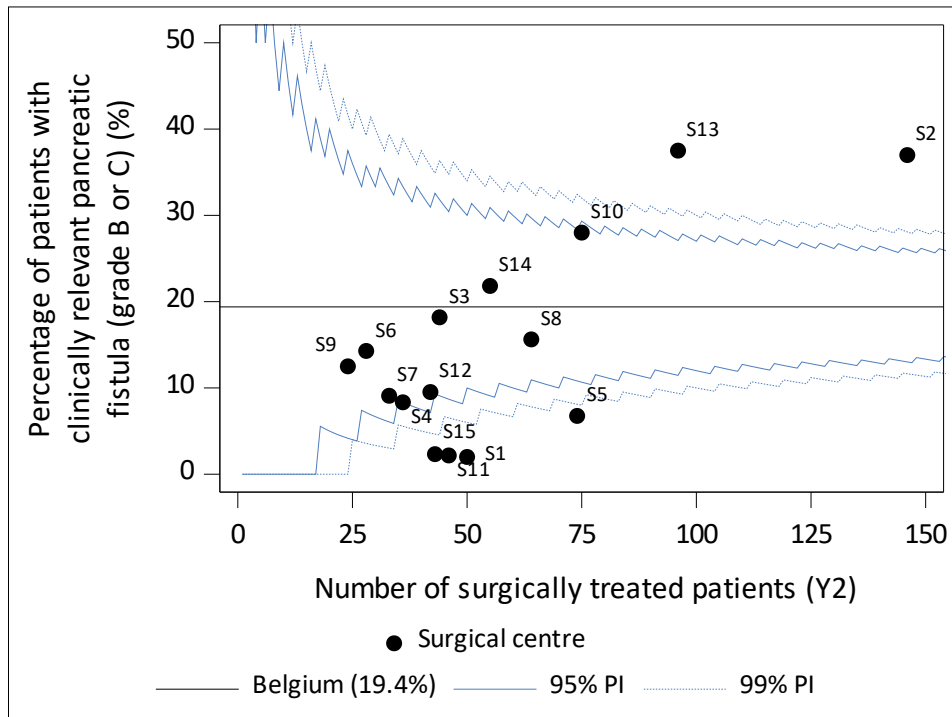


Figure 23: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

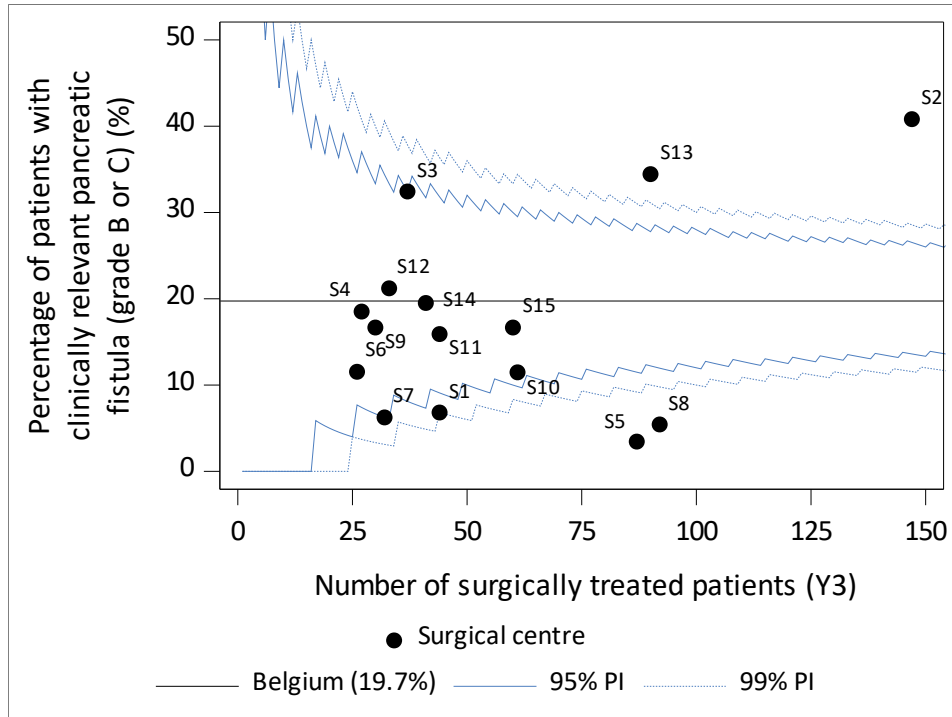
(a)



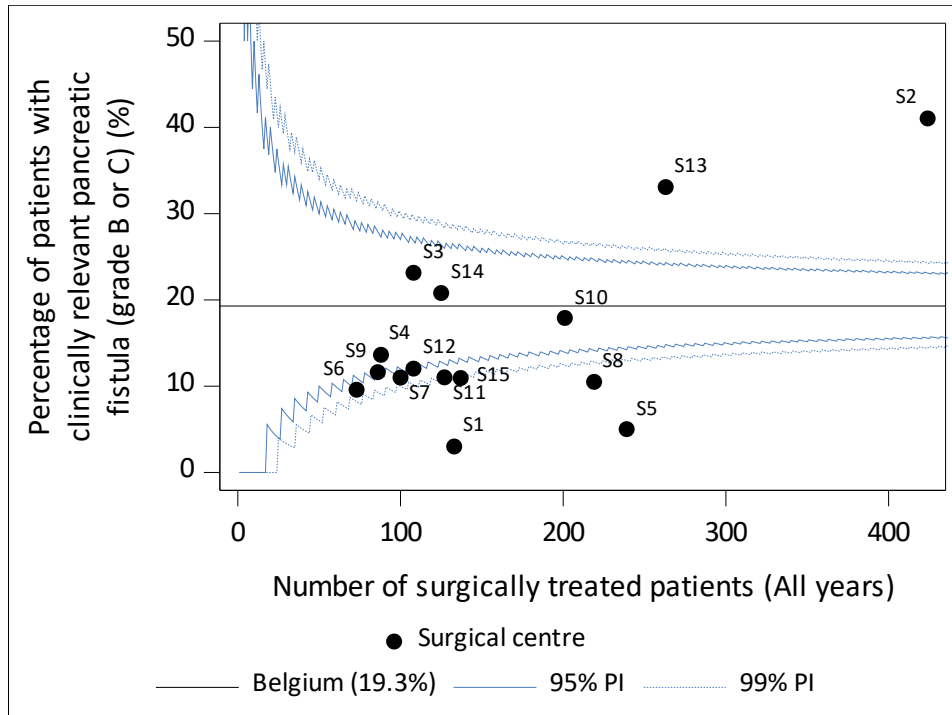
(b)



(c)



(d)



(e)

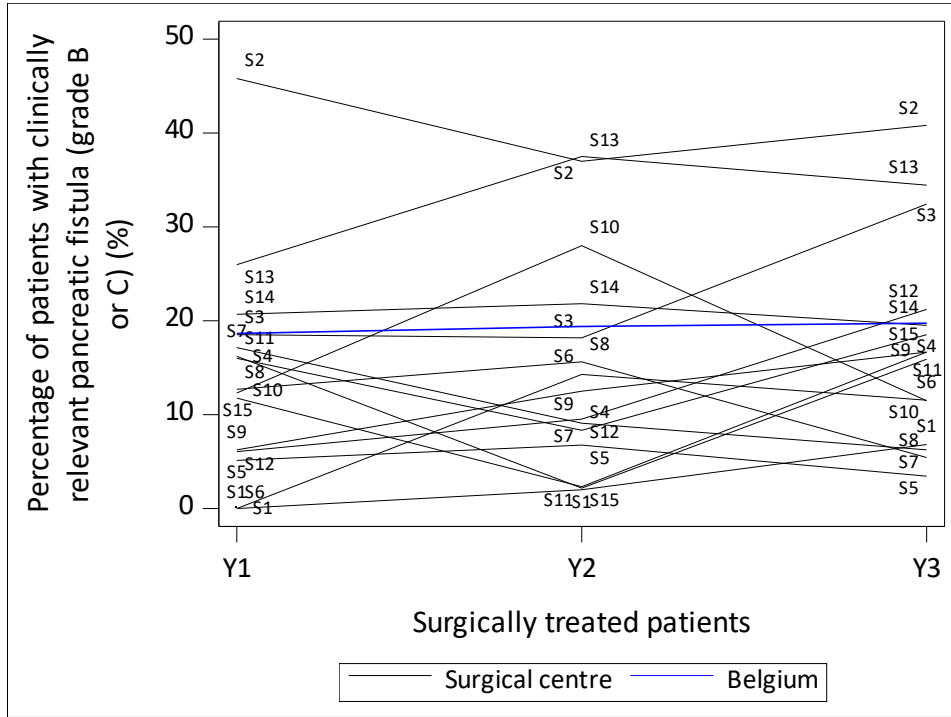
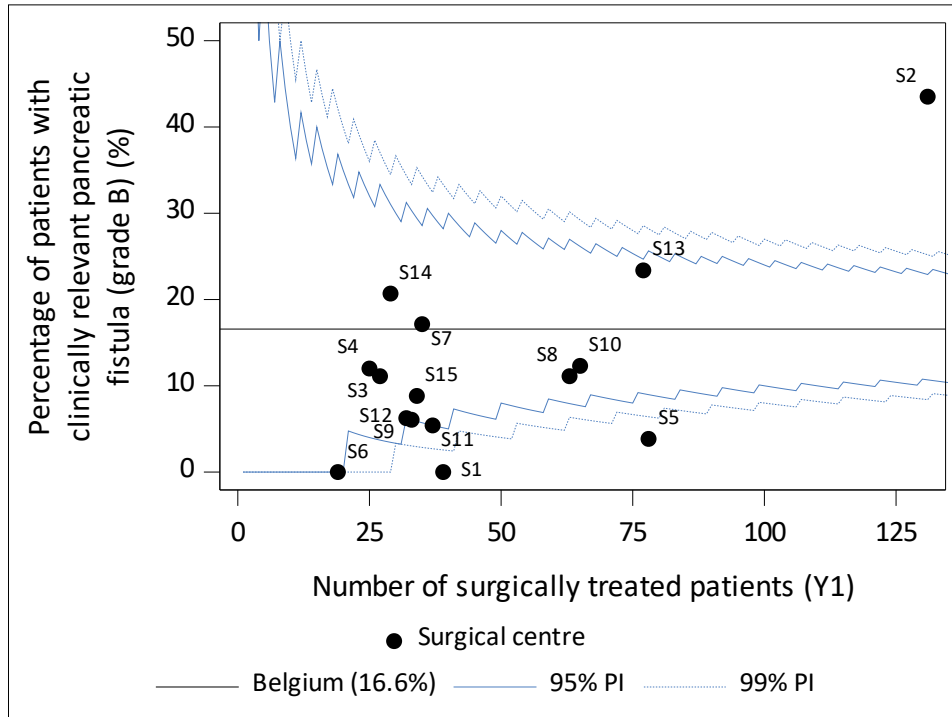
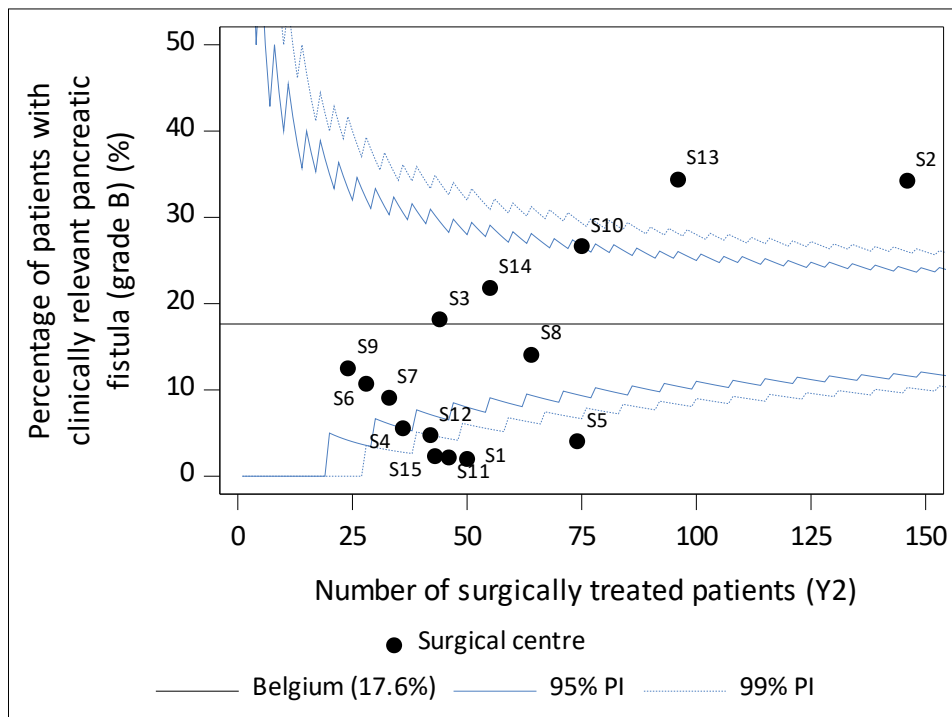


Figure 24: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

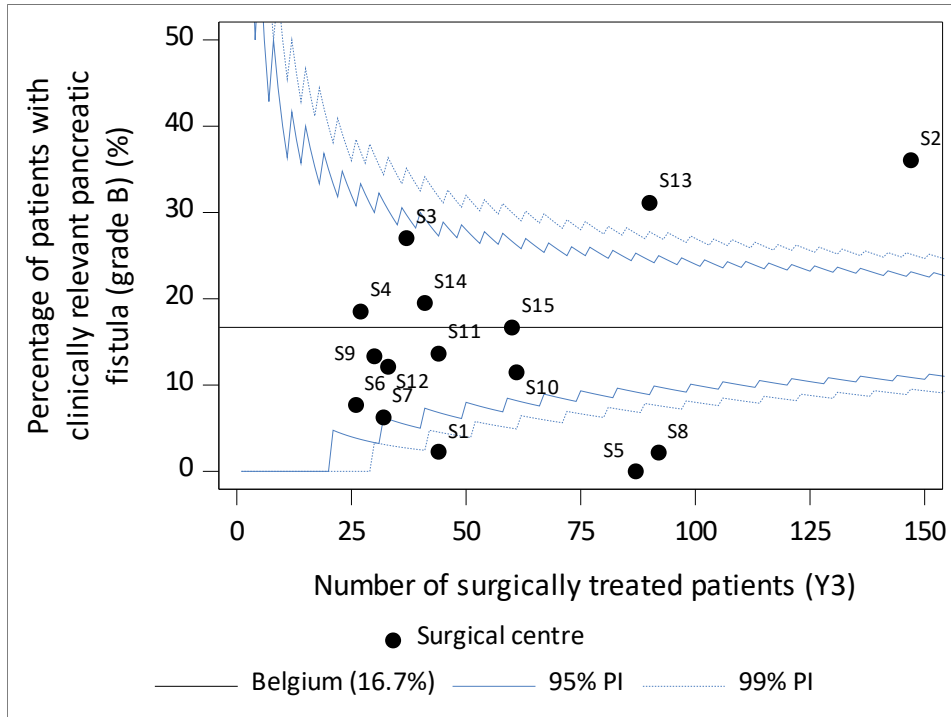
(a)



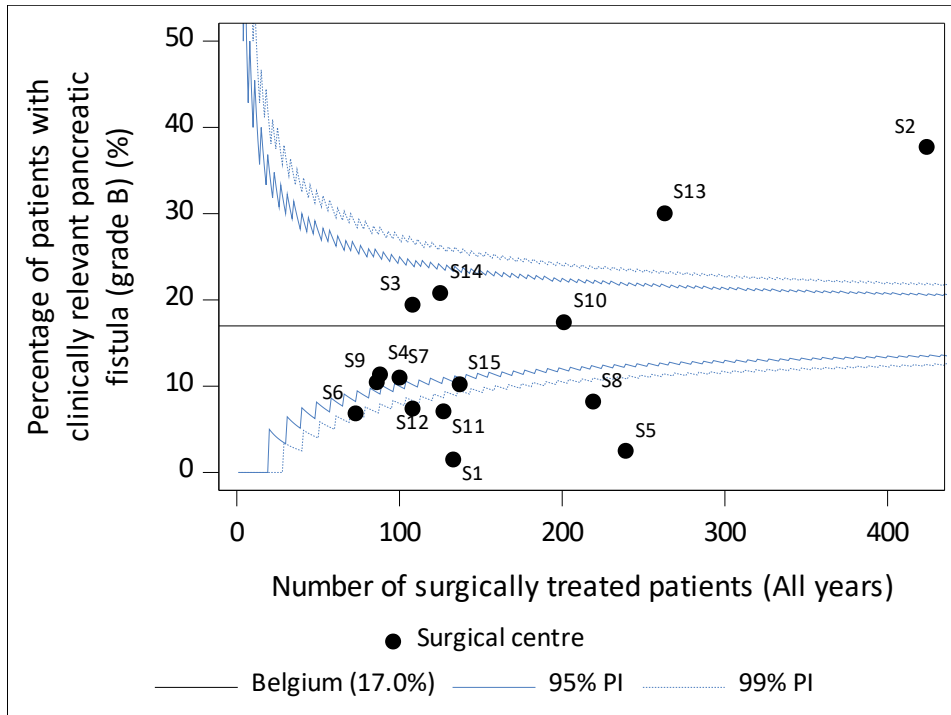
(b)



(c)



(d)



(e)

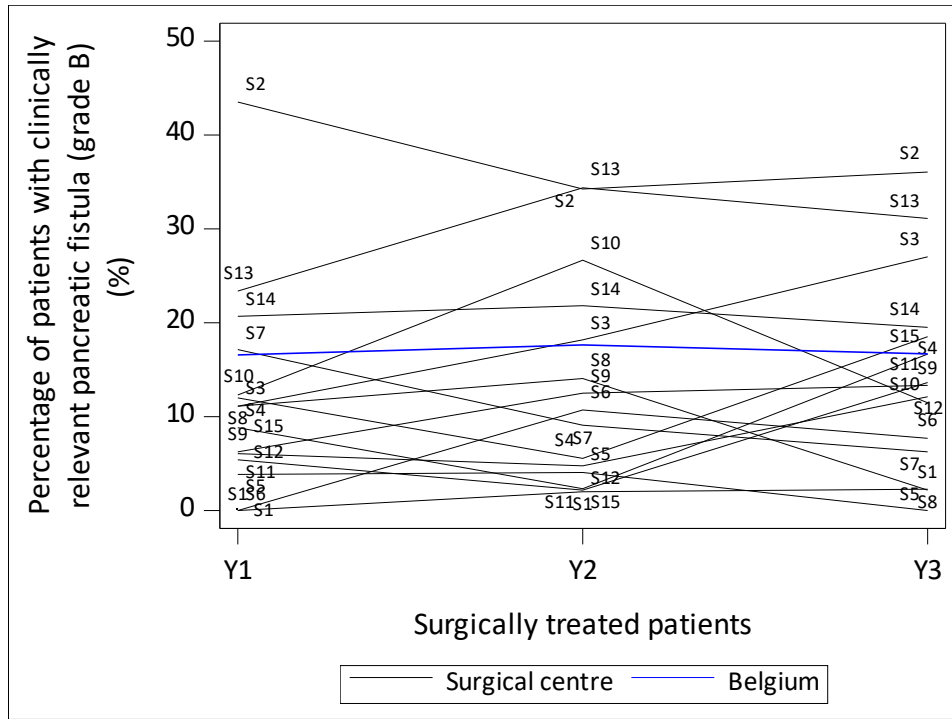
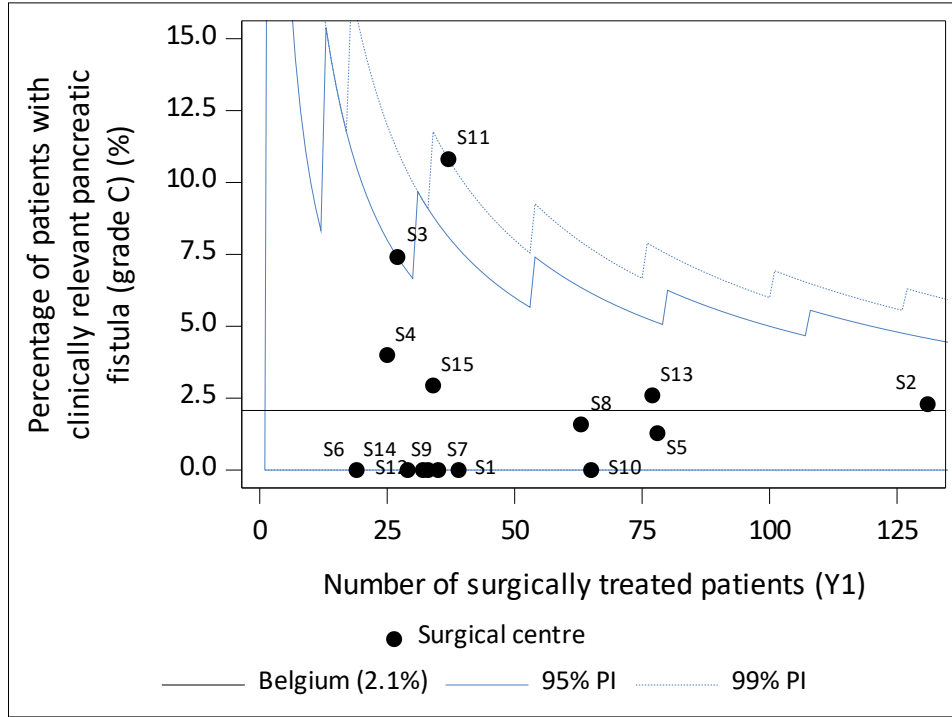
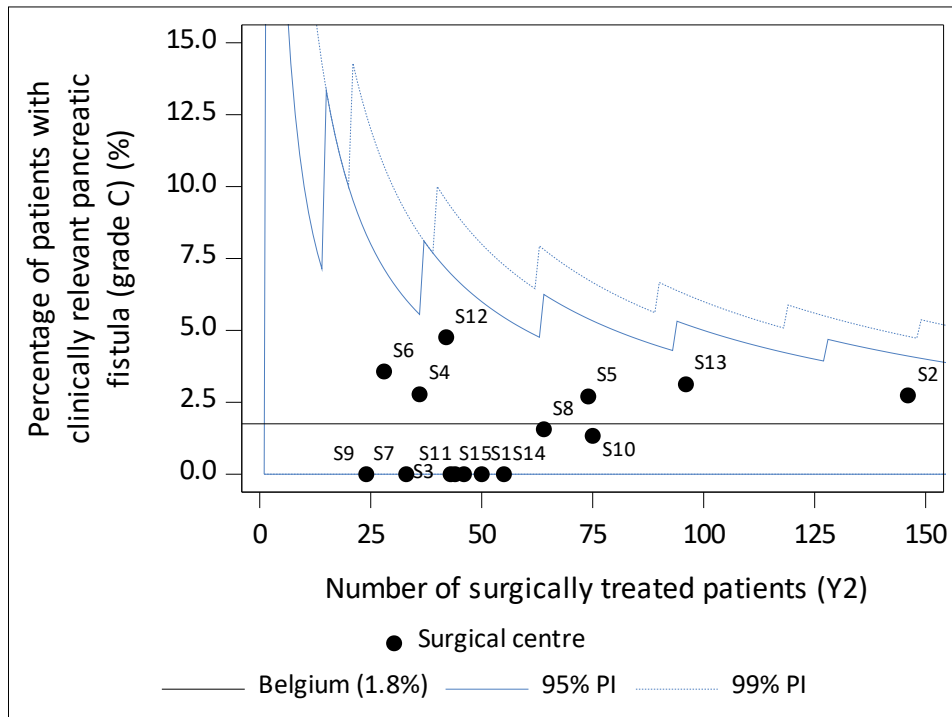


Figure 25: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

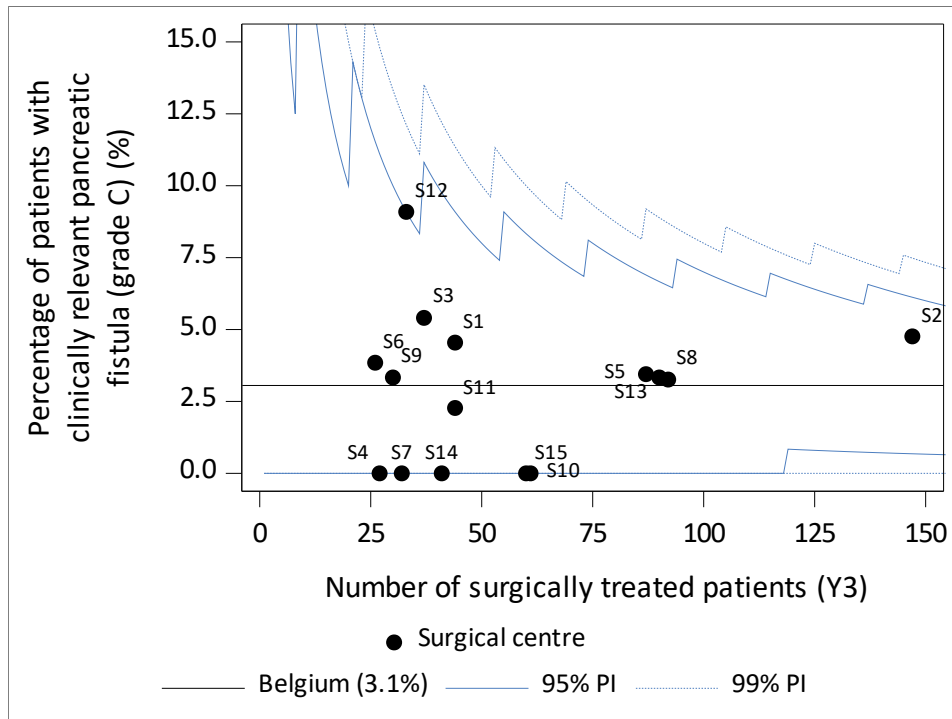
(a)



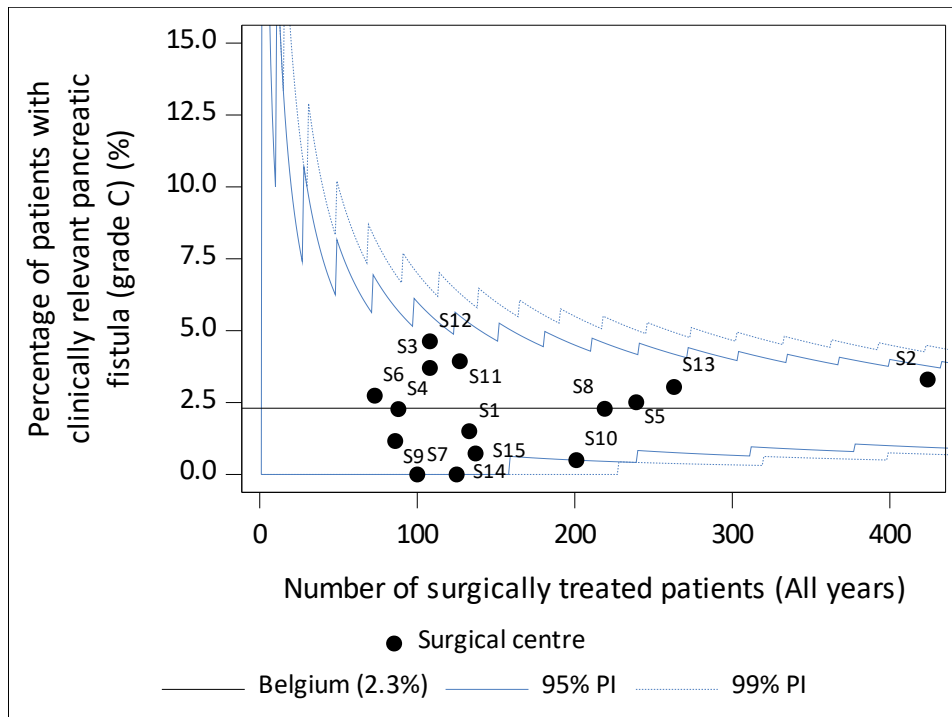
(b)



(c)



(d)



(e)

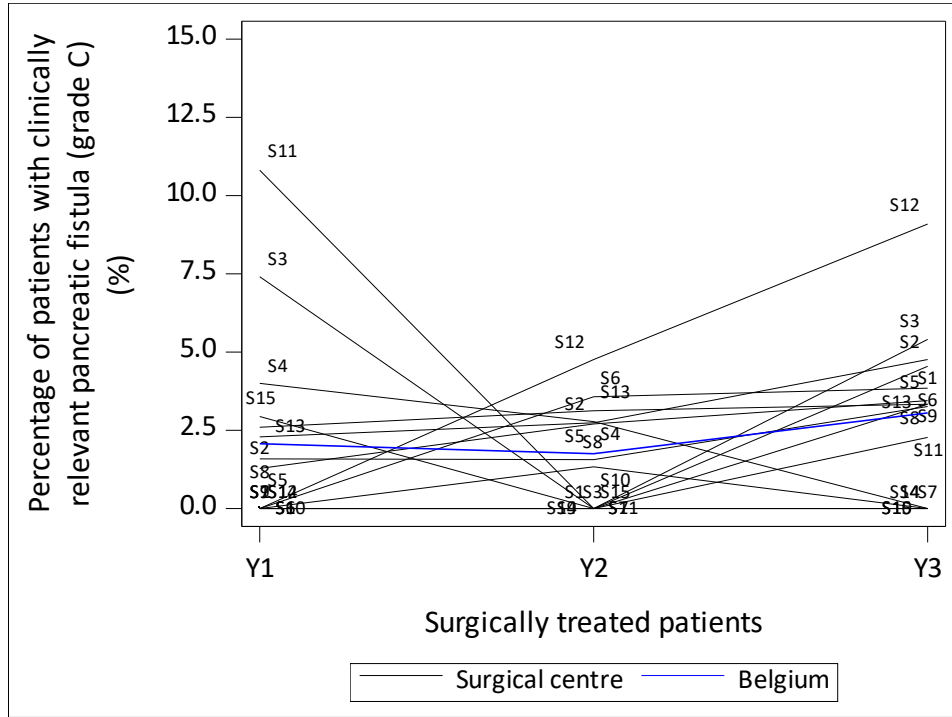
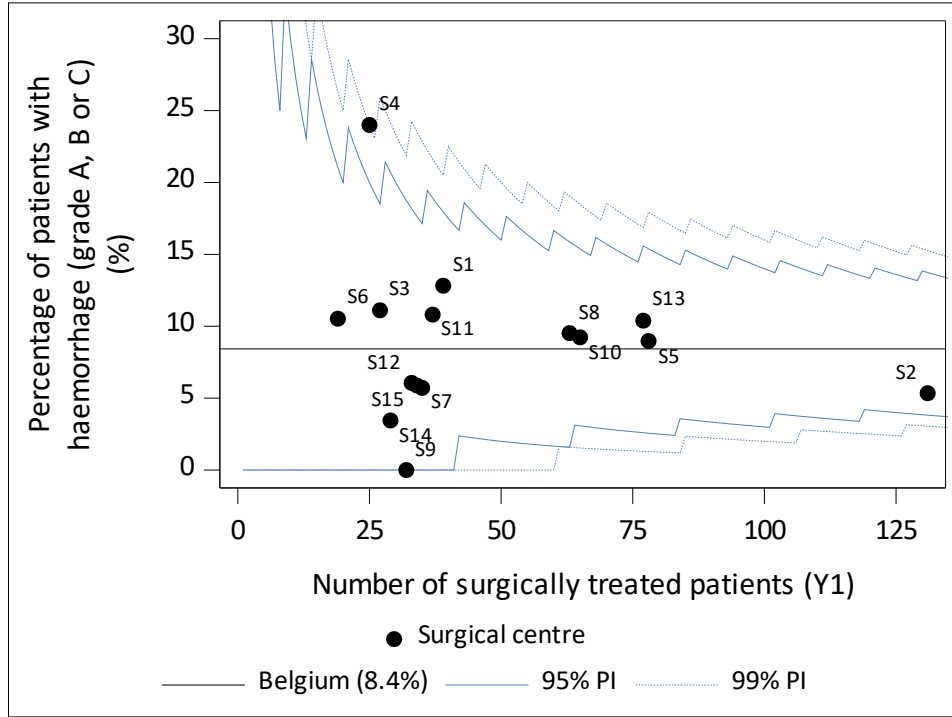
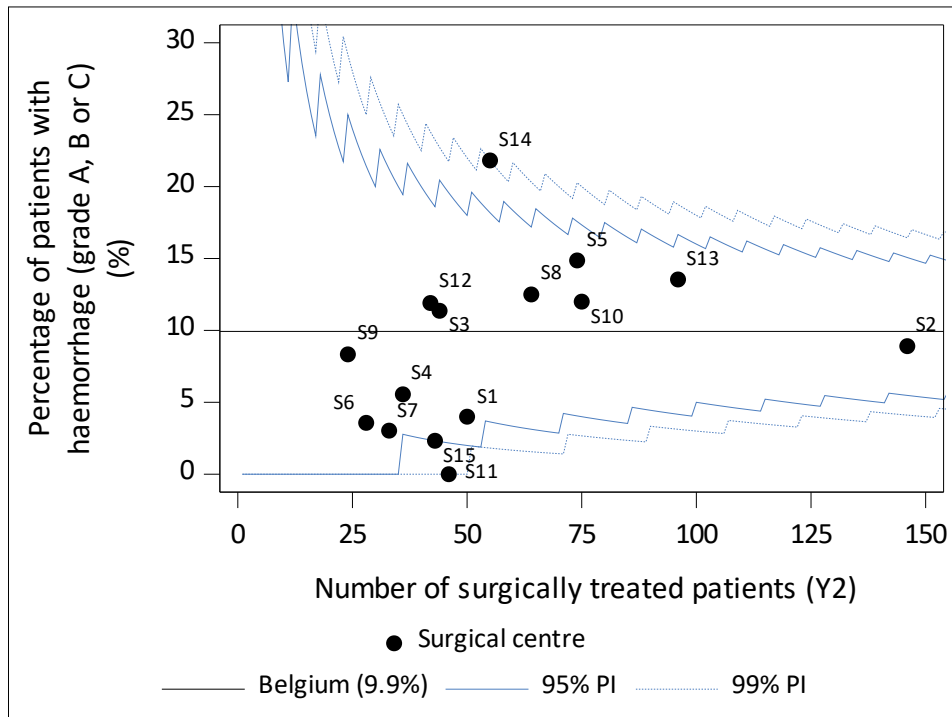


Figure 26: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

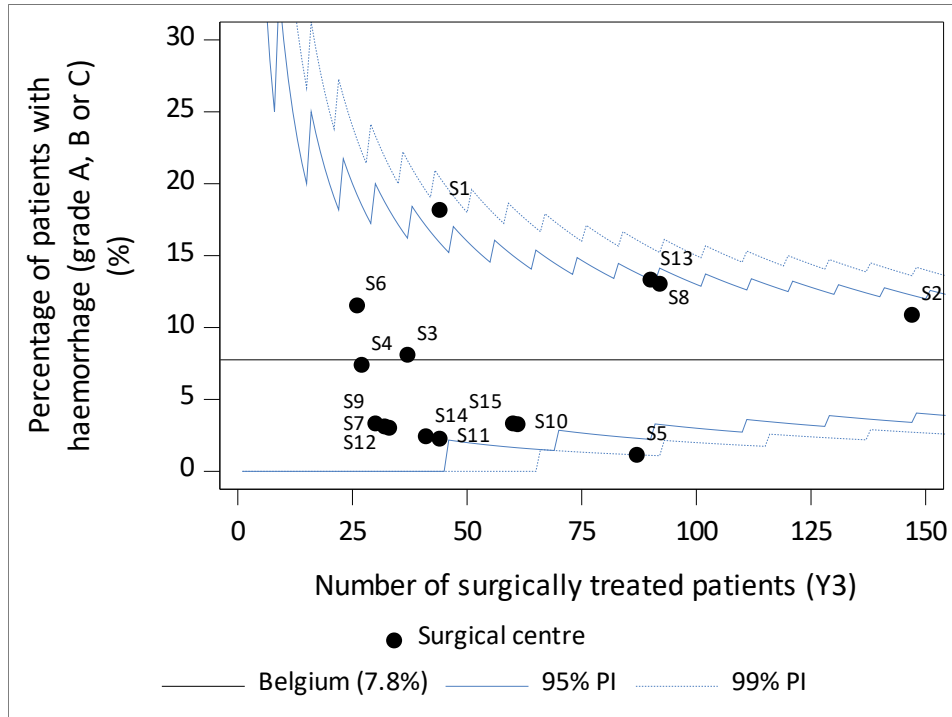
(a)



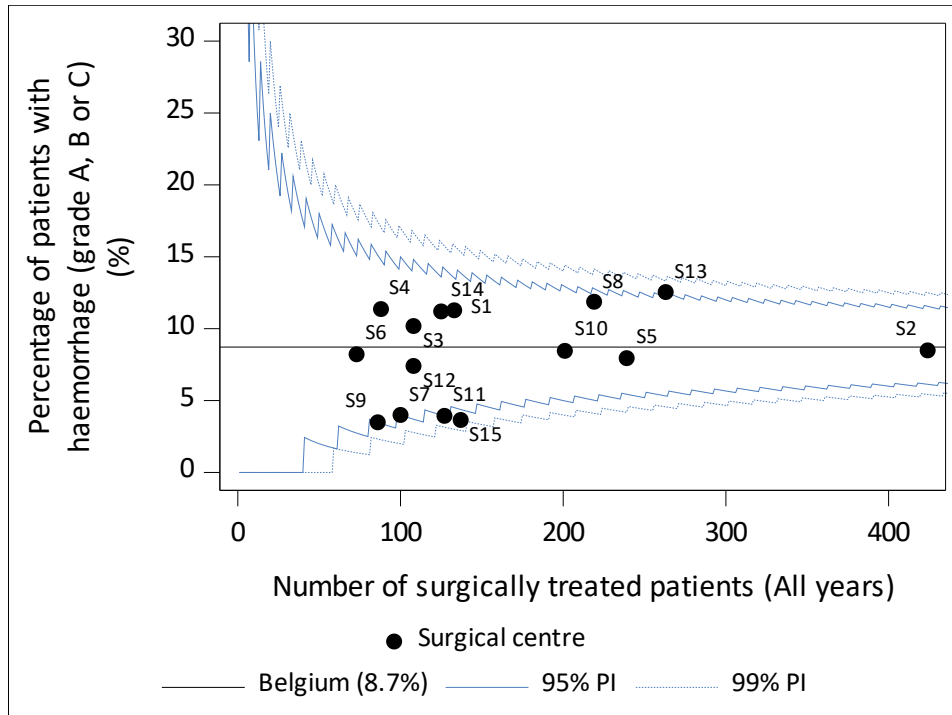
(b)



(c)



(d)



(e)

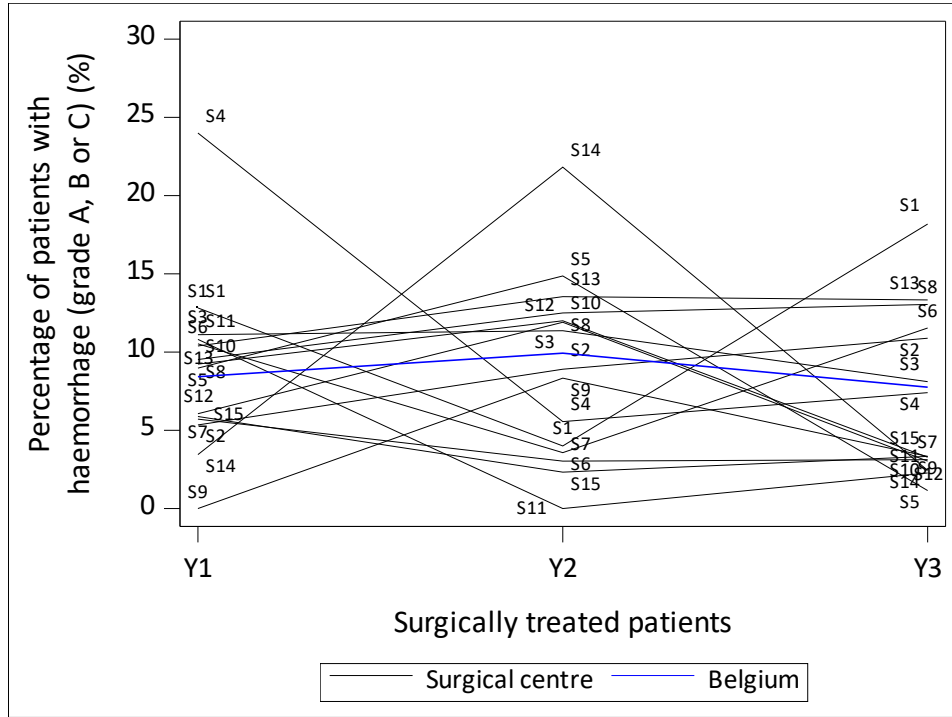
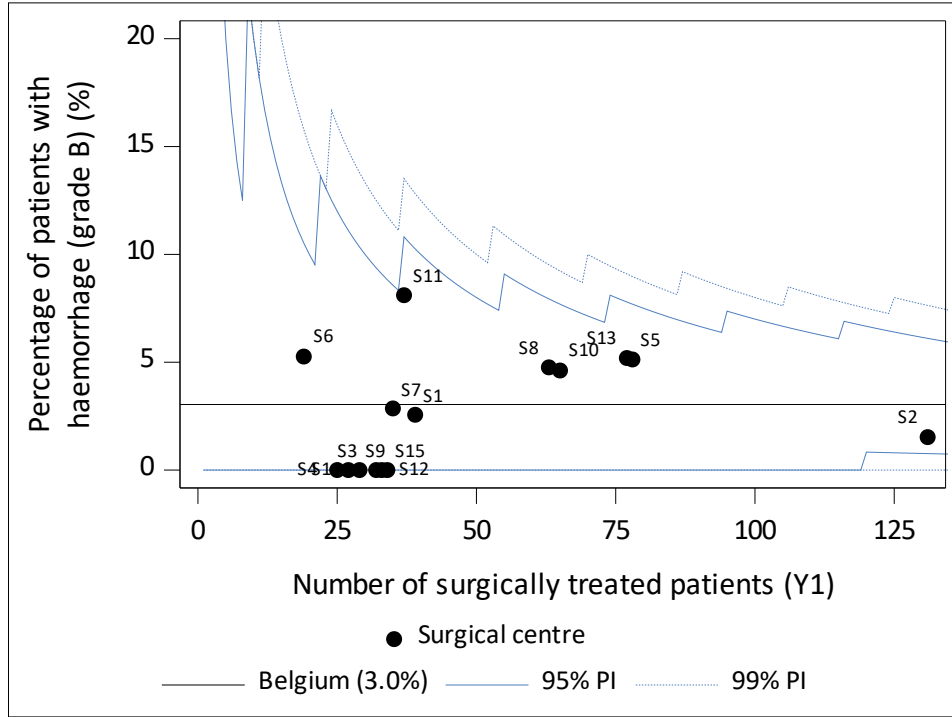
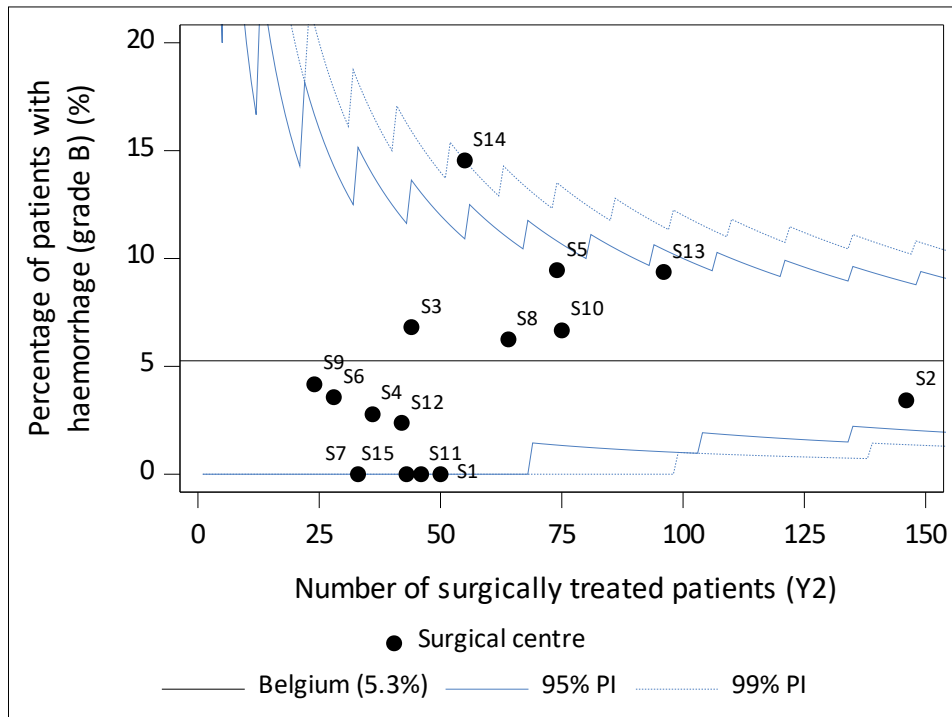


Figure 27: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **haemorrhage (grade B, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

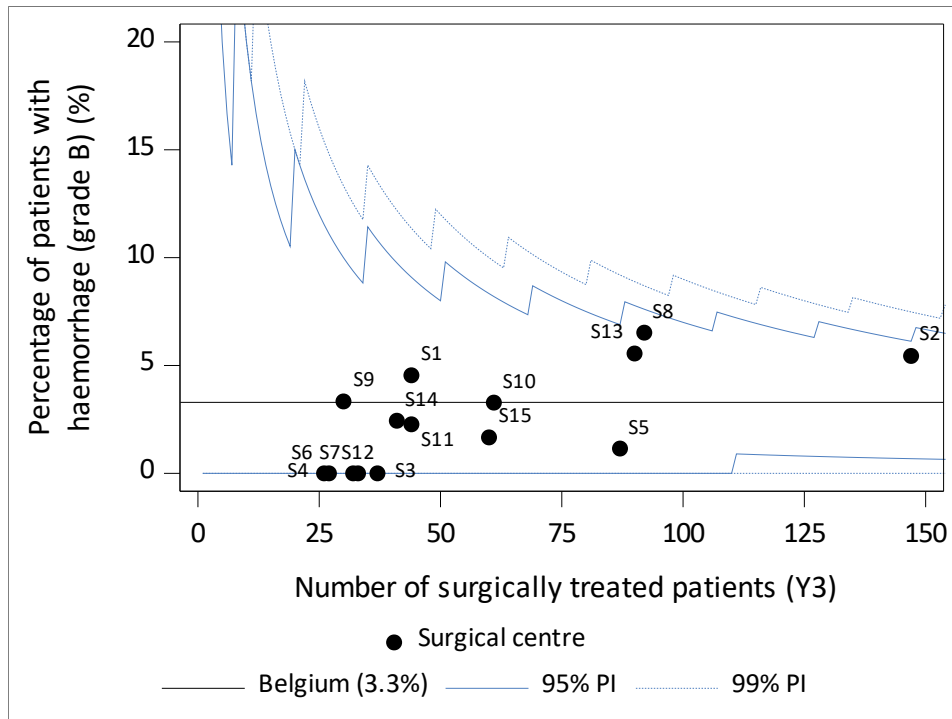
(a)



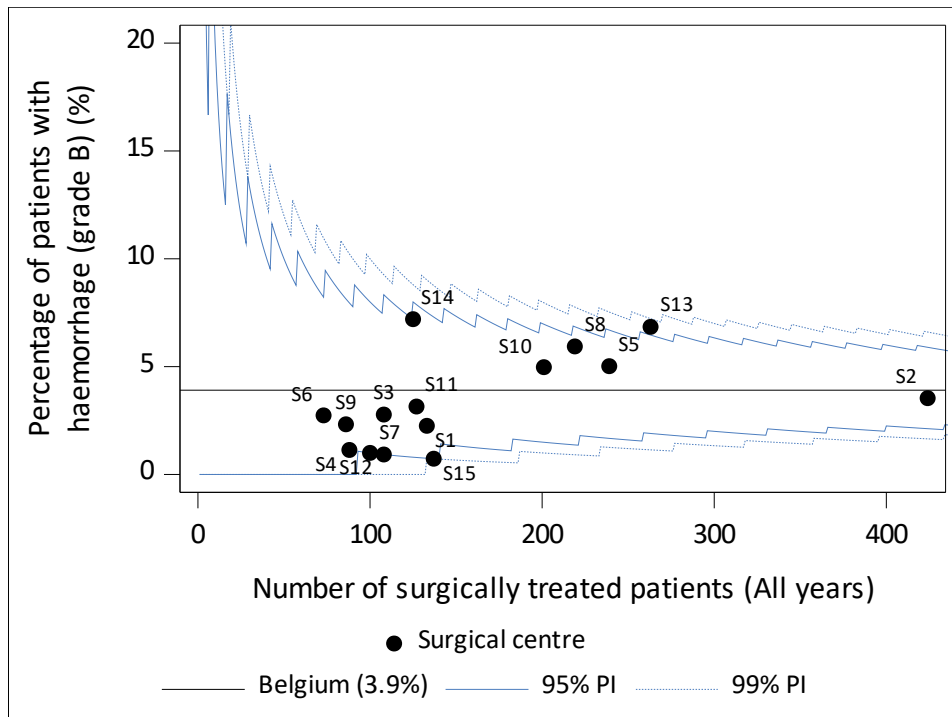
(b)



(c)



(d)



(e)

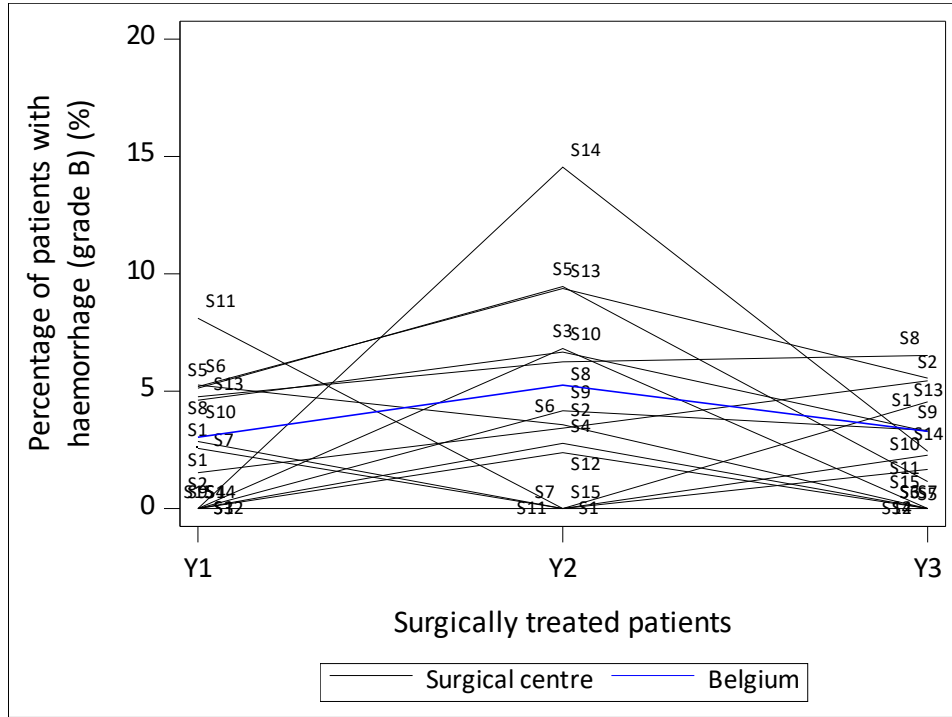
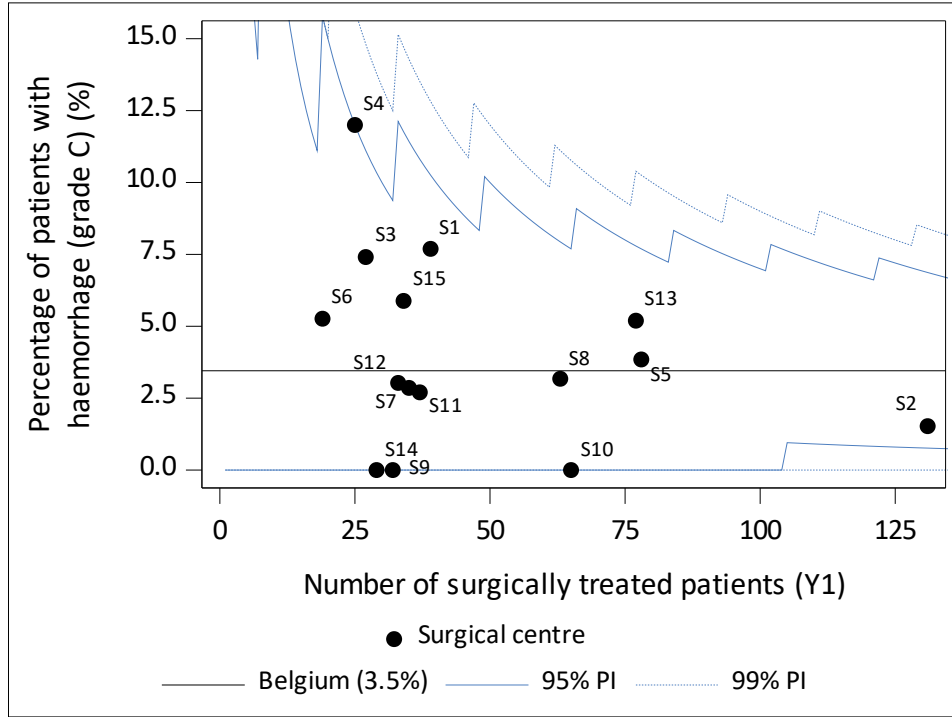
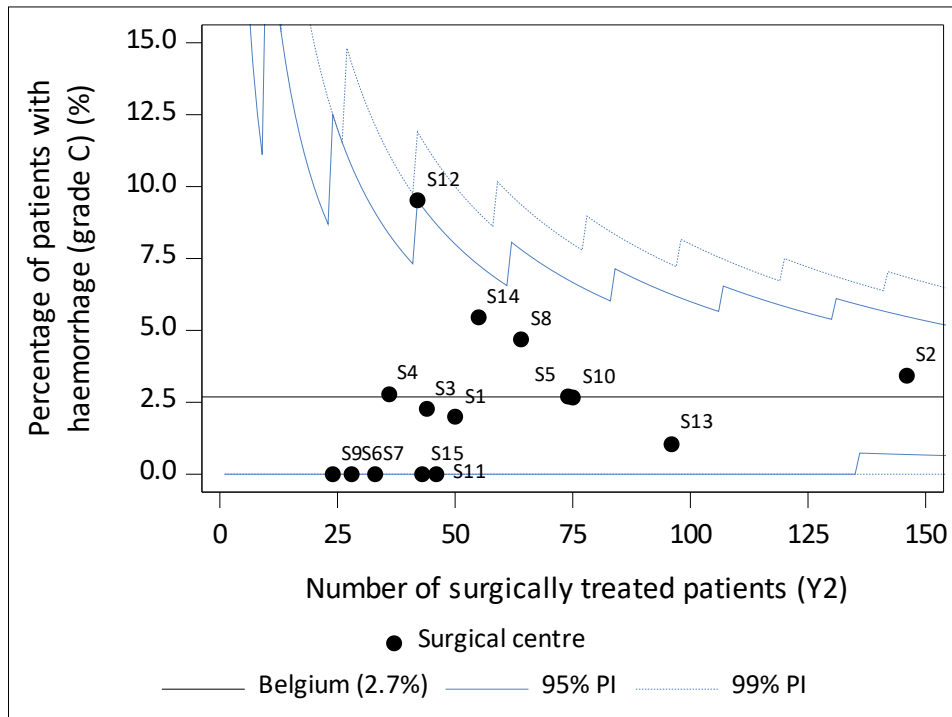


Figure 28: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with haemorrhage (grade C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

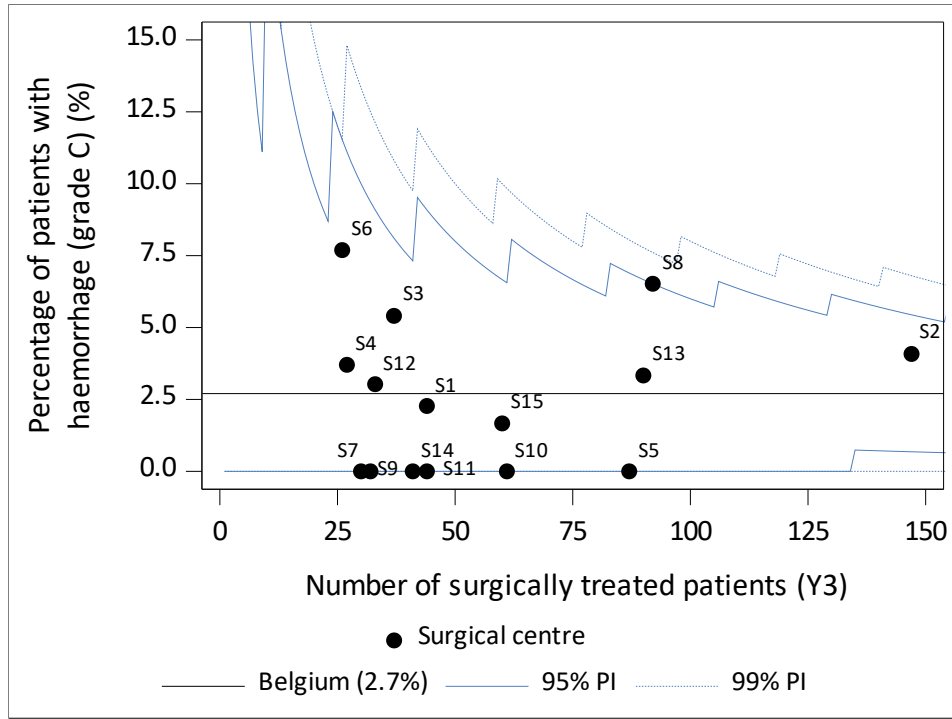
(a)



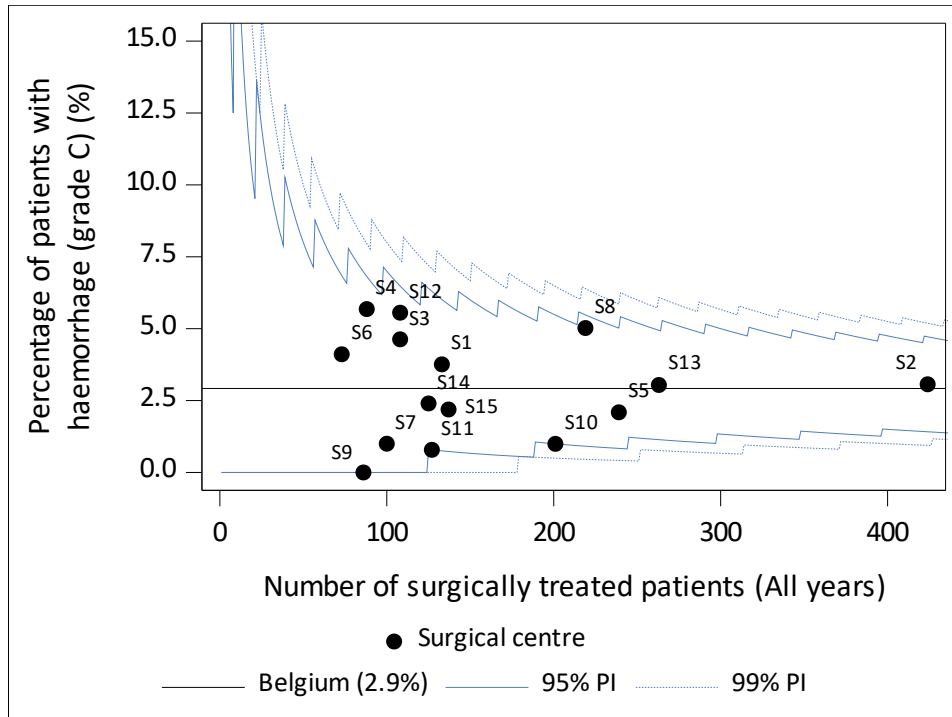
(b)



(c)



(d)



(e)

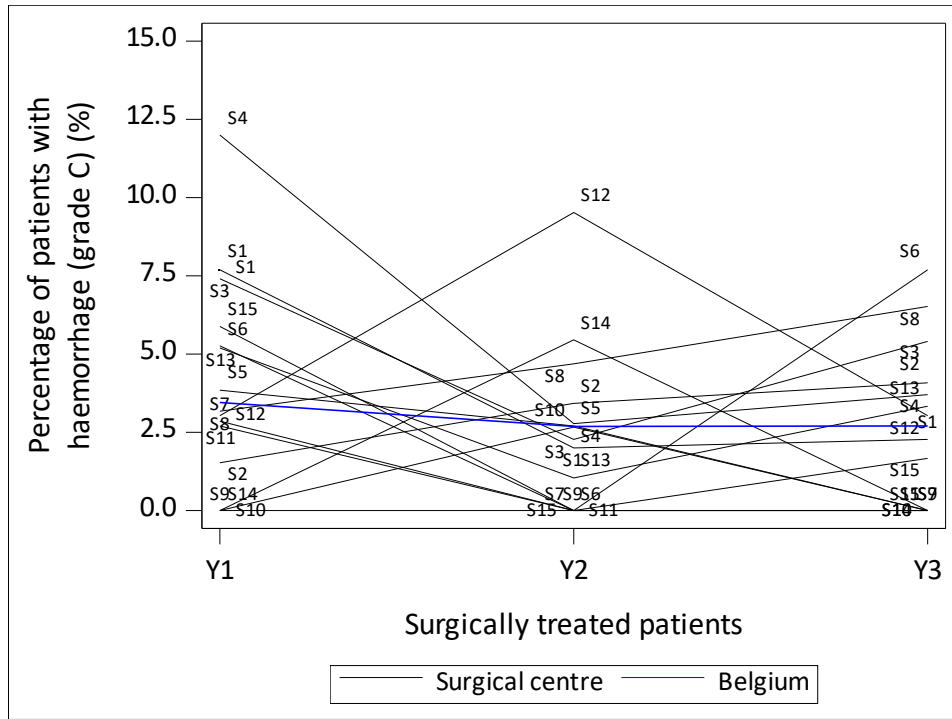
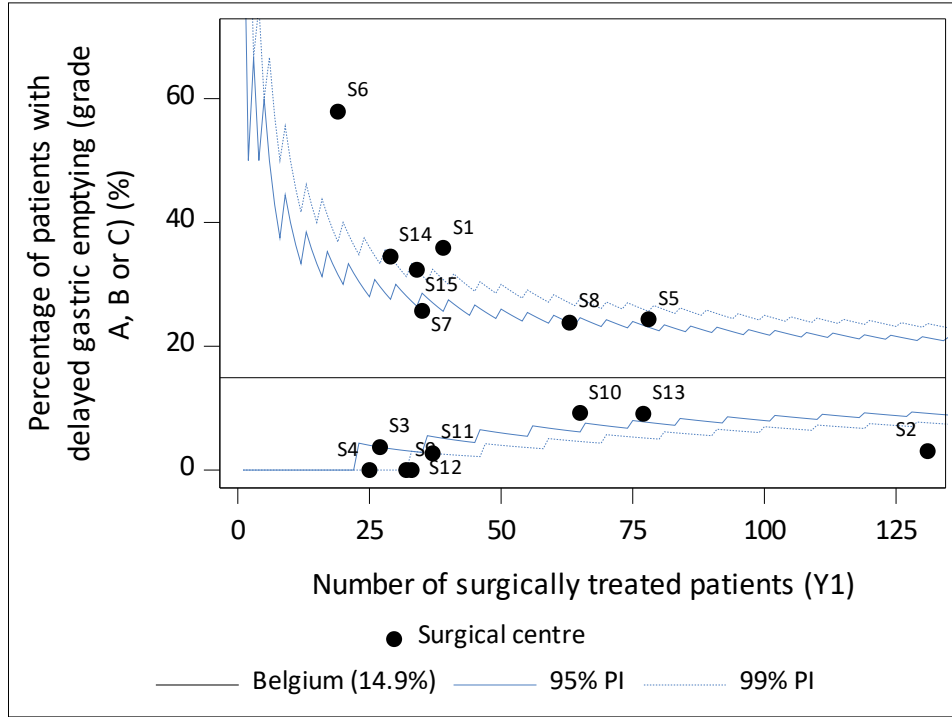
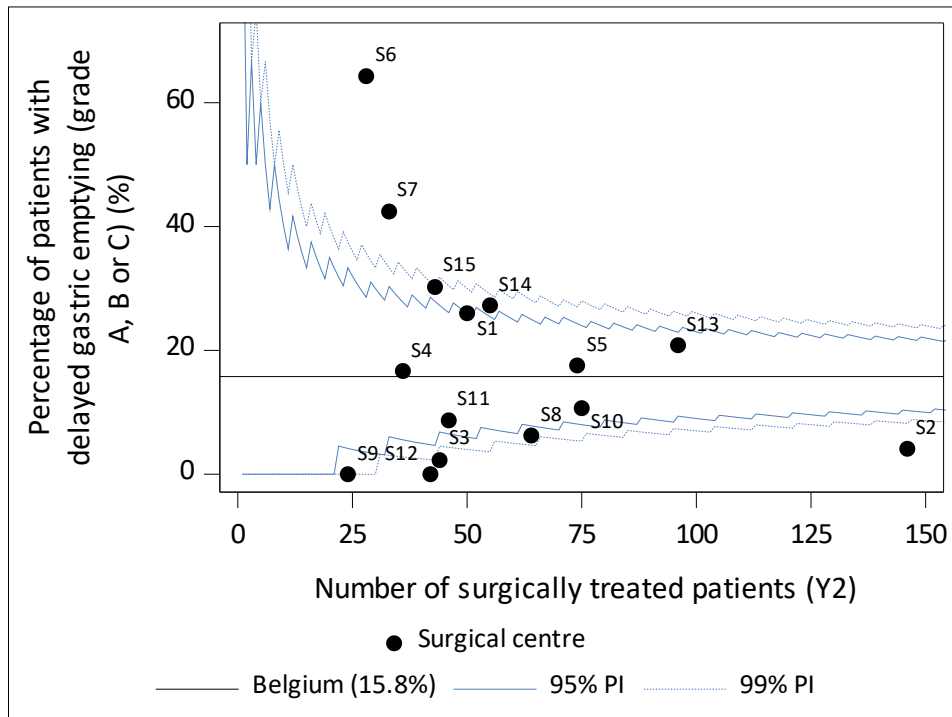


Figure 29: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

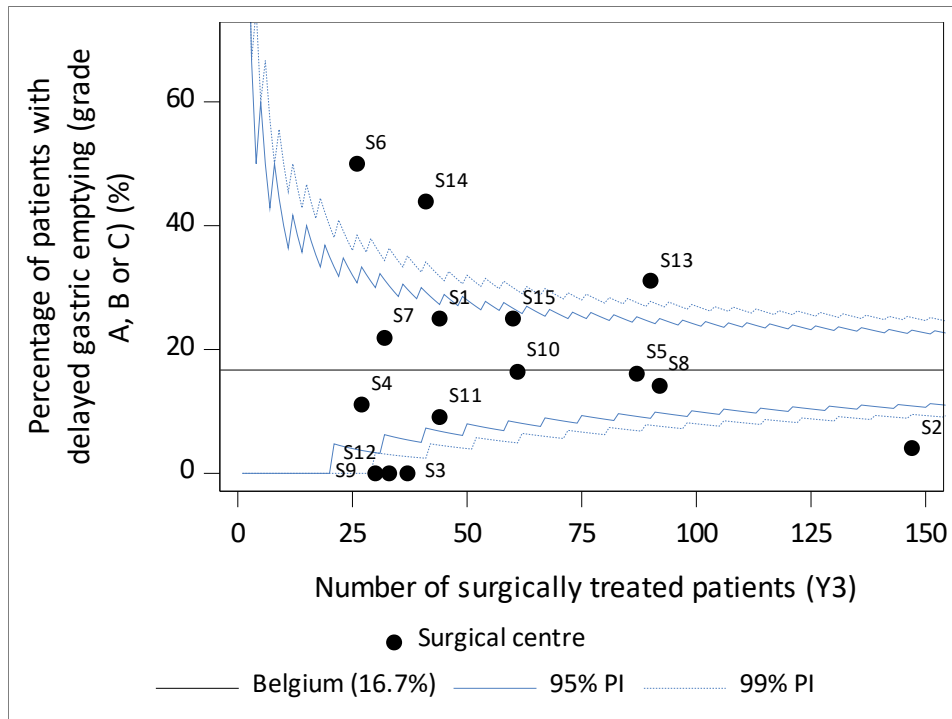
(a)



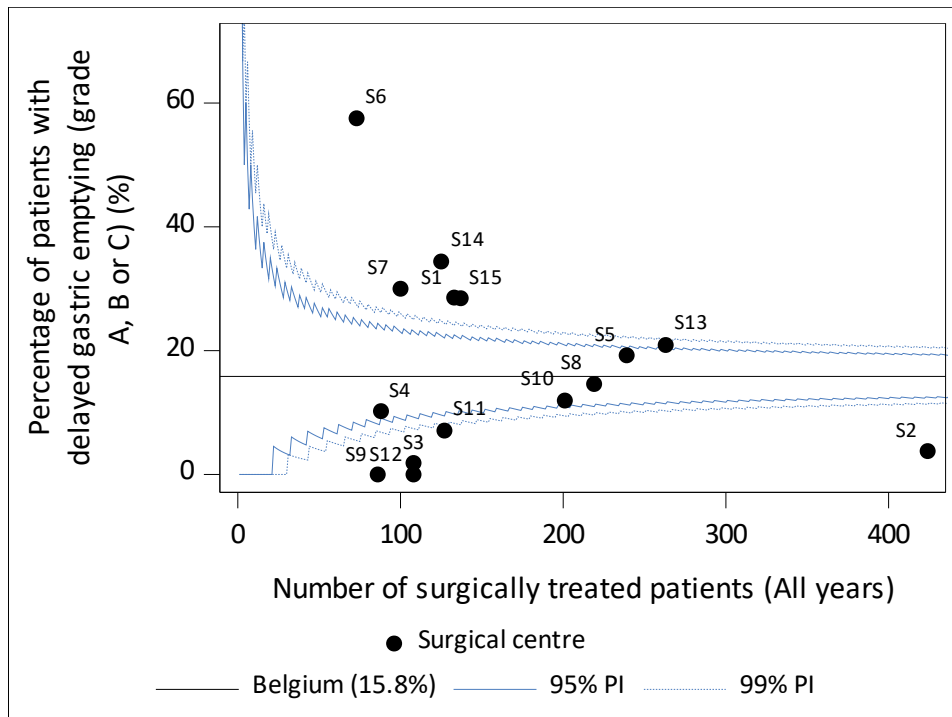
(b)



(c)



(d)



(e)

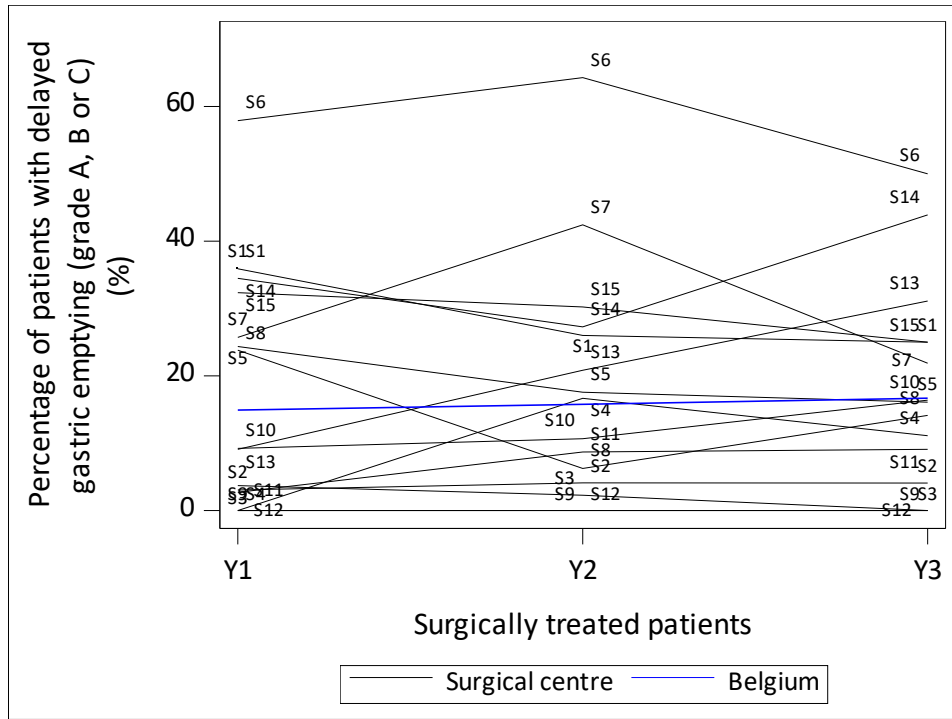
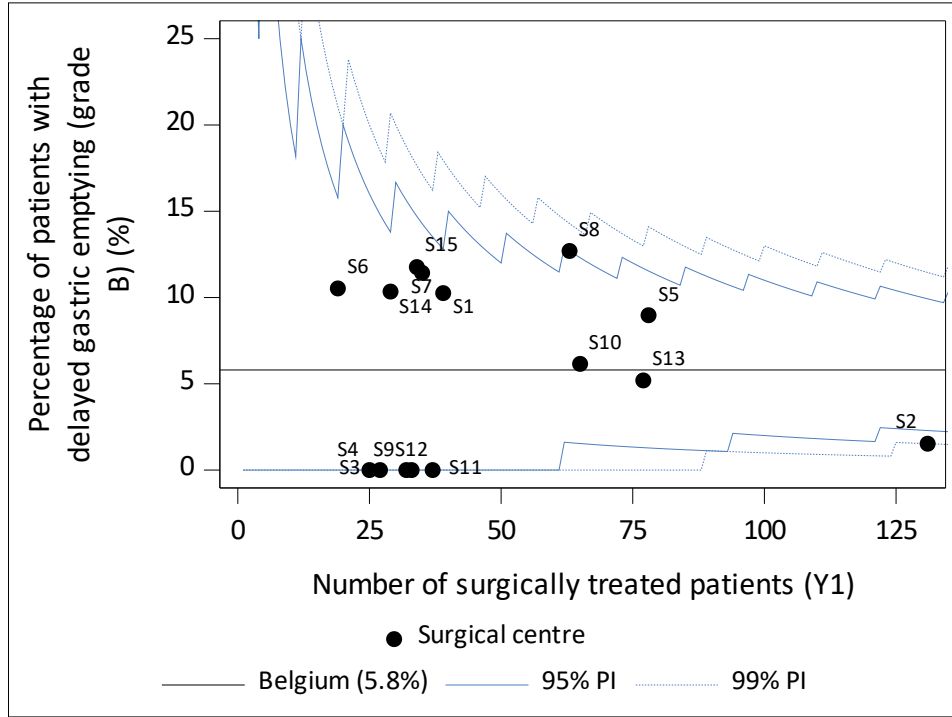
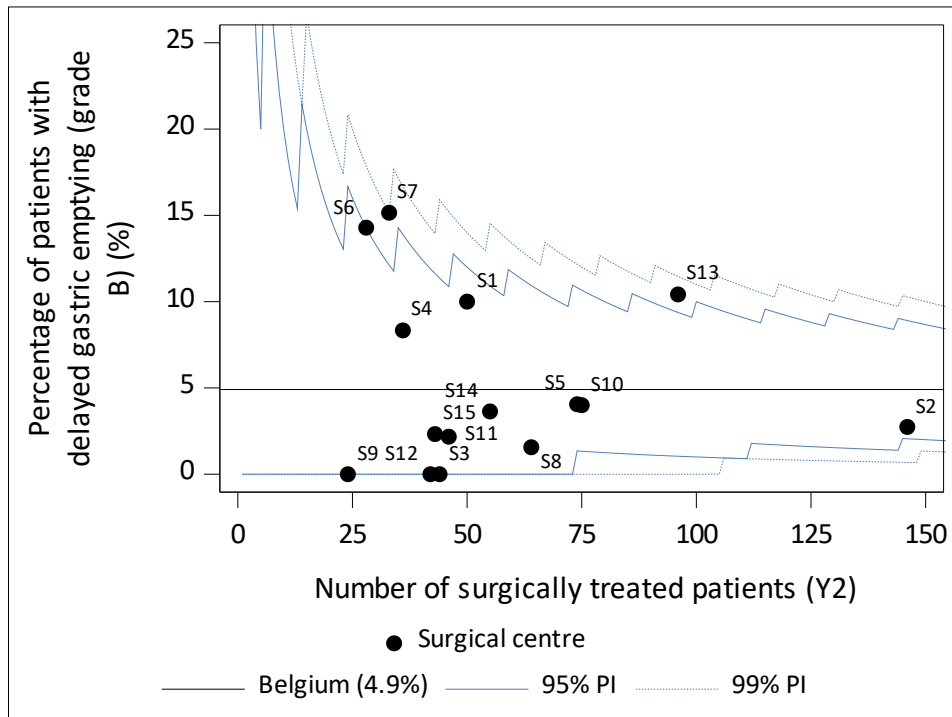


Figure 30: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with delayed gastric emptying (grade B, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

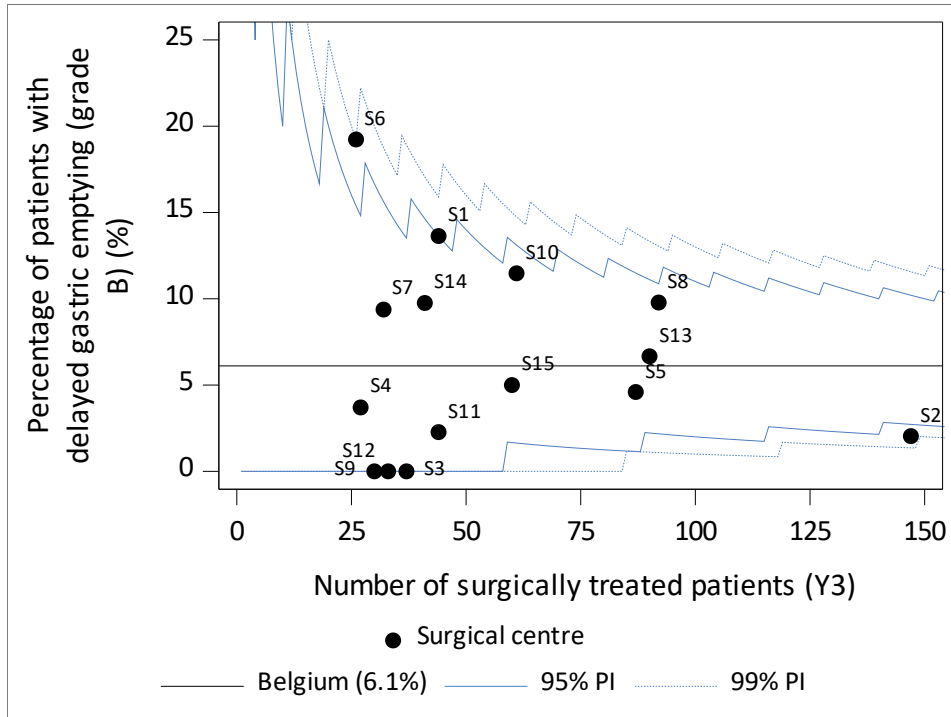
(a)



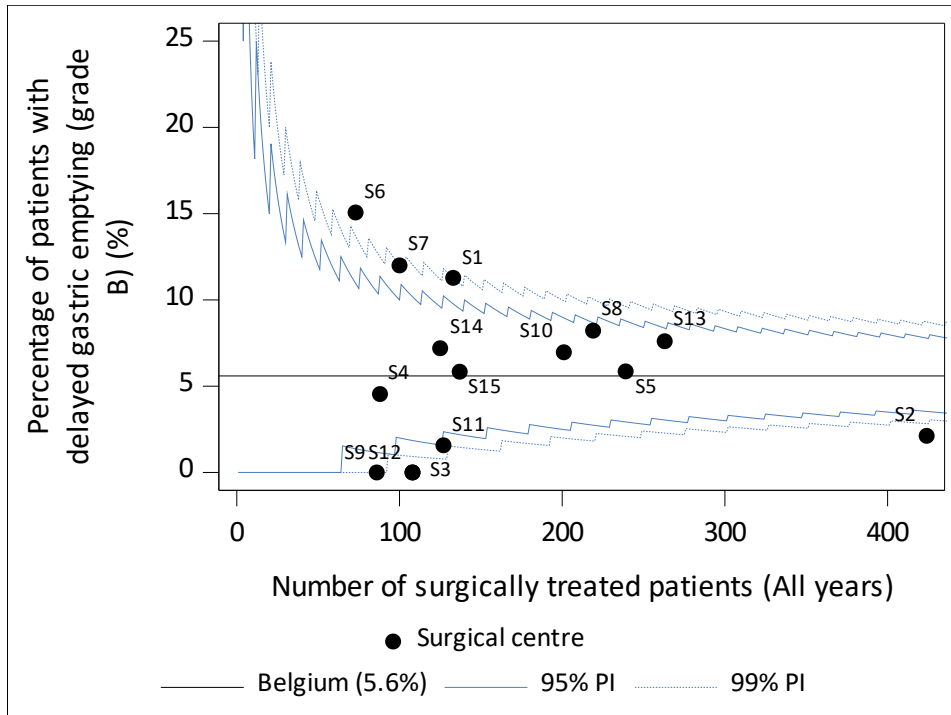
(b)



(c)



(d)



(e)

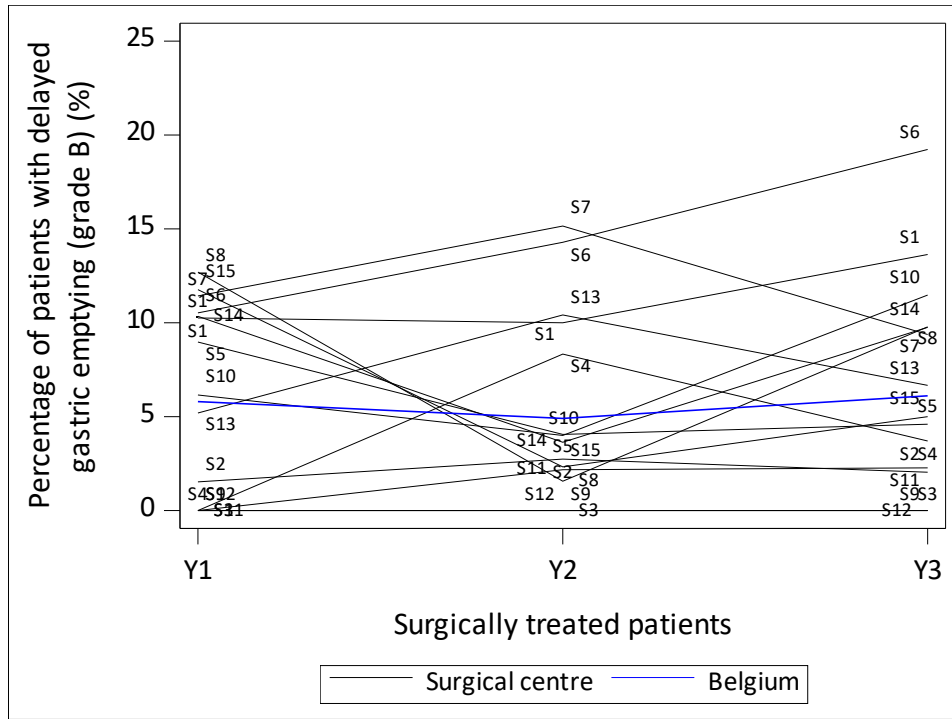
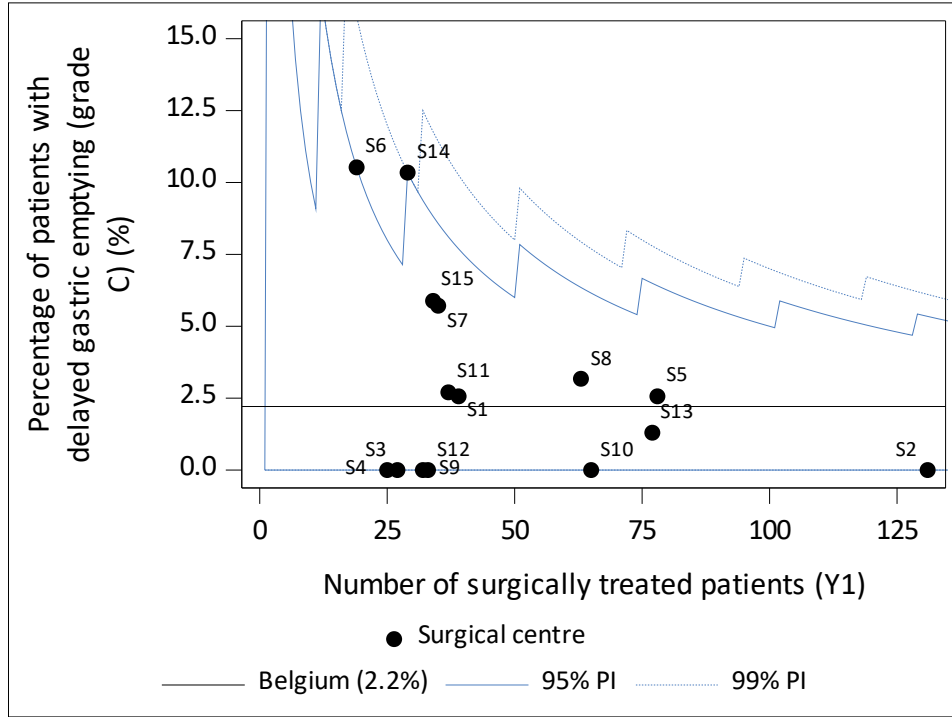
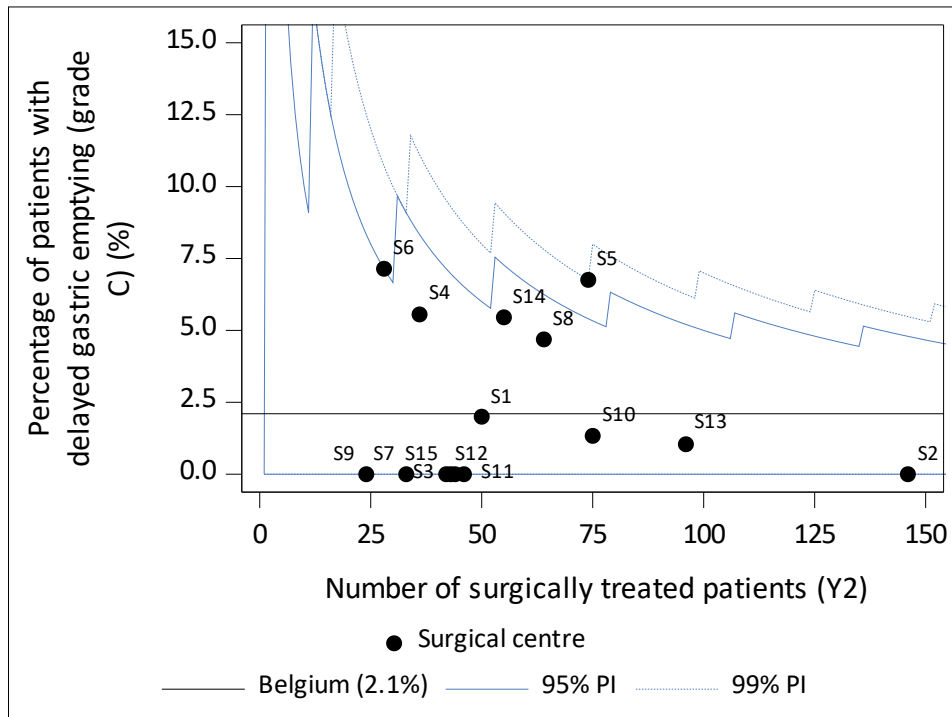


Figure 31: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

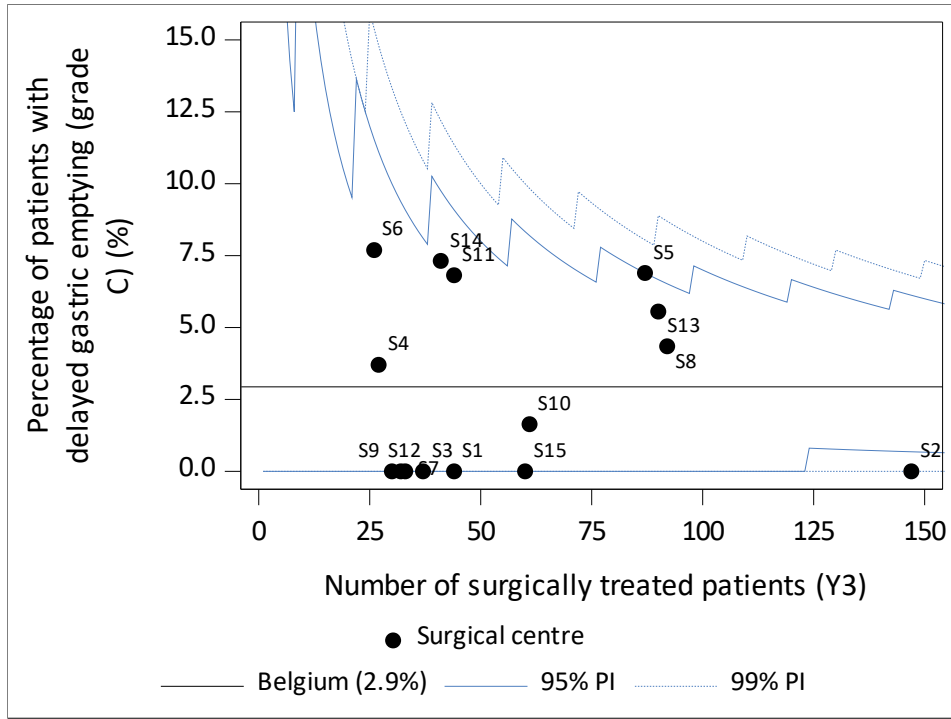
(a)



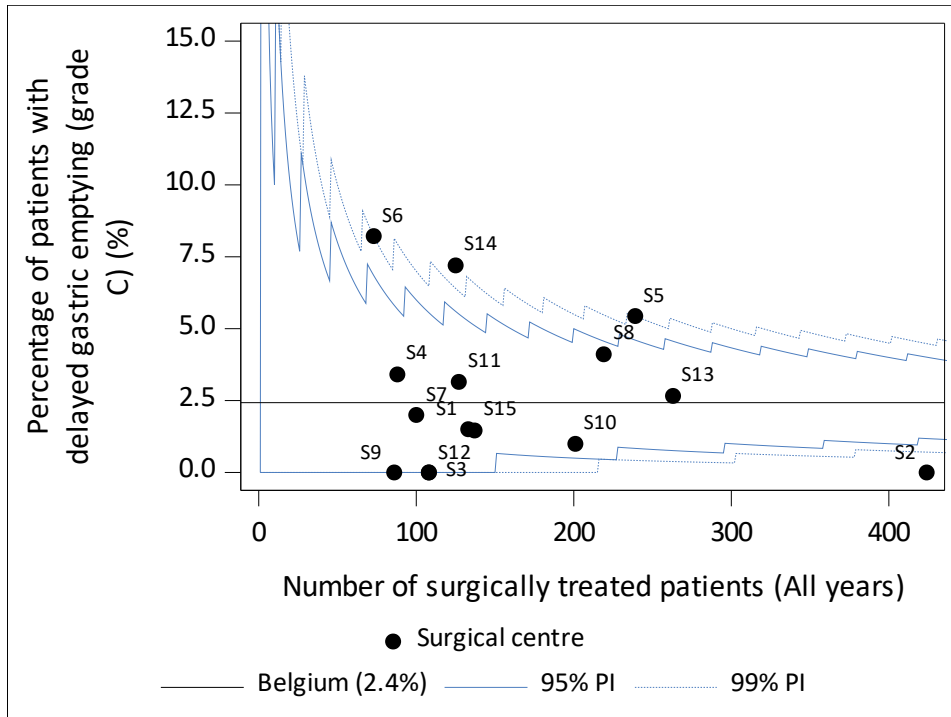
(b)



(c)



(d)



(e)

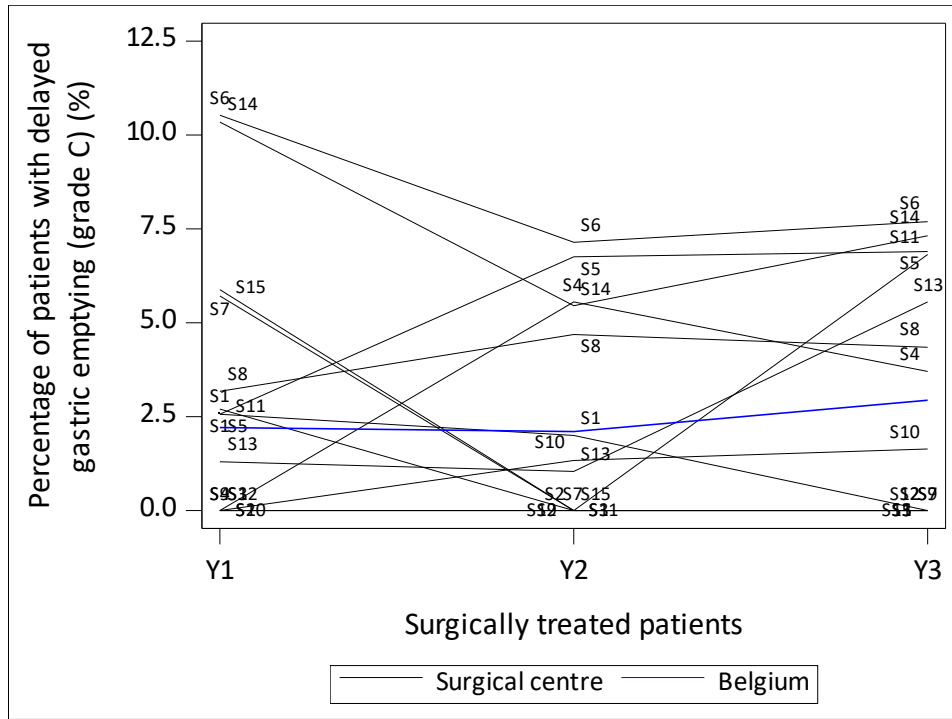
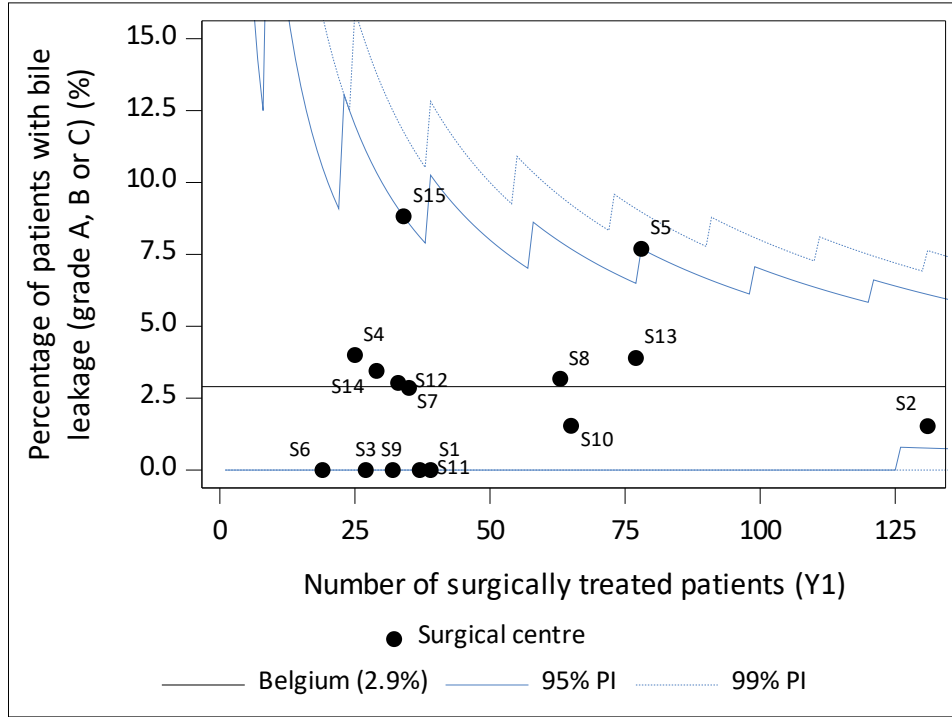
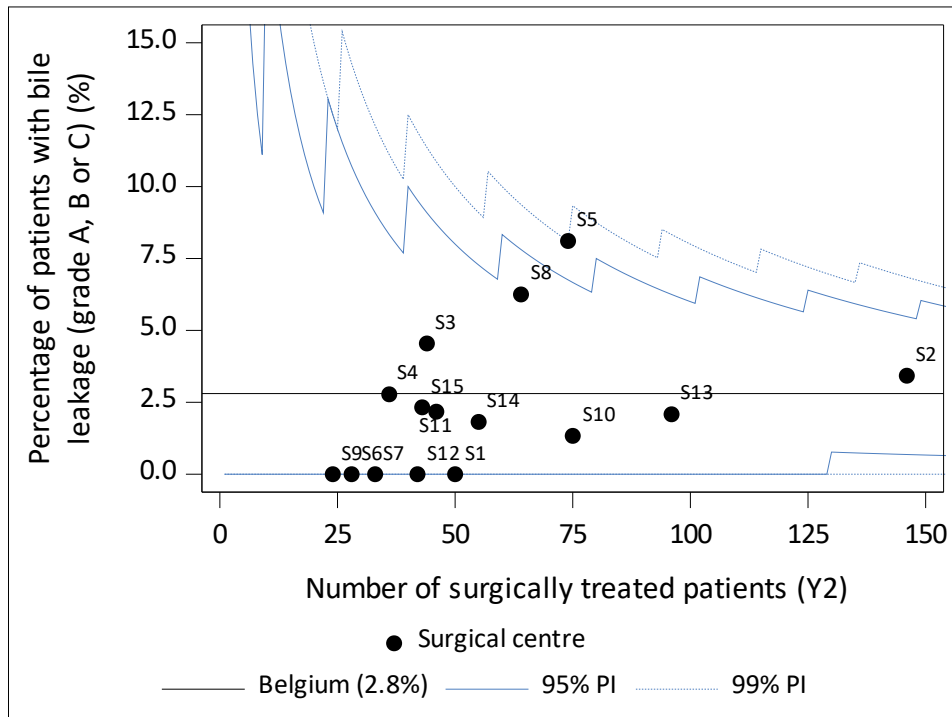


Figure 32: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

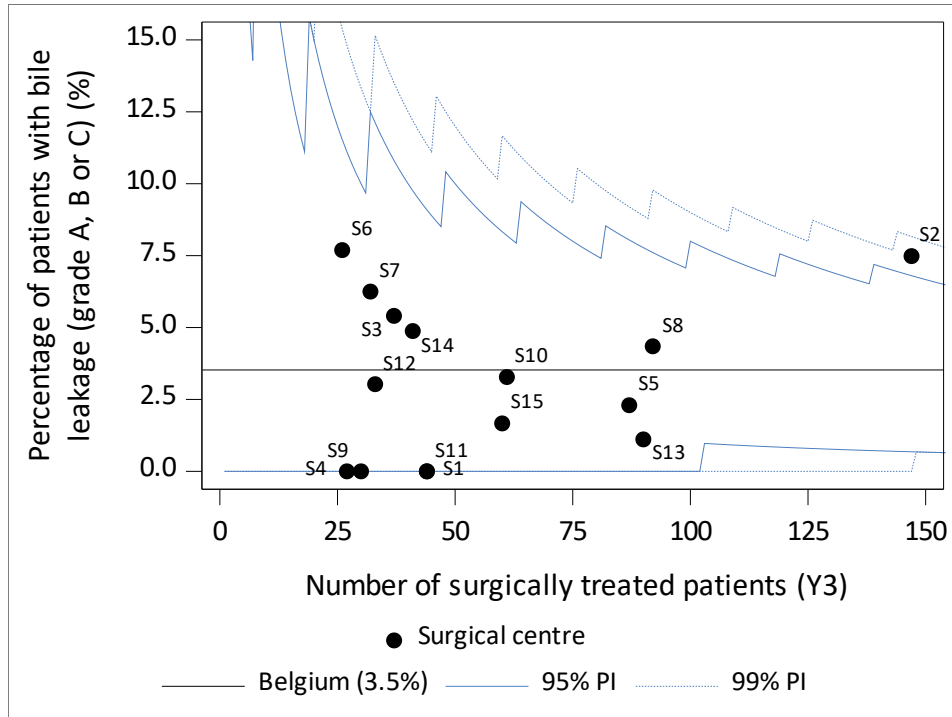
(a)



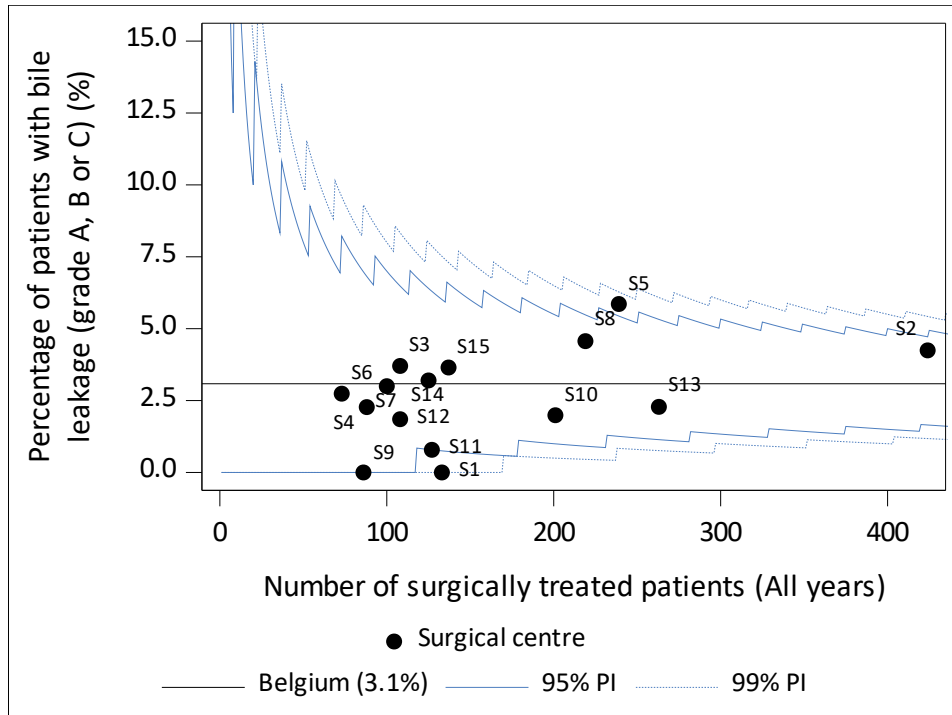
(b)



(c)



(d)



(e)

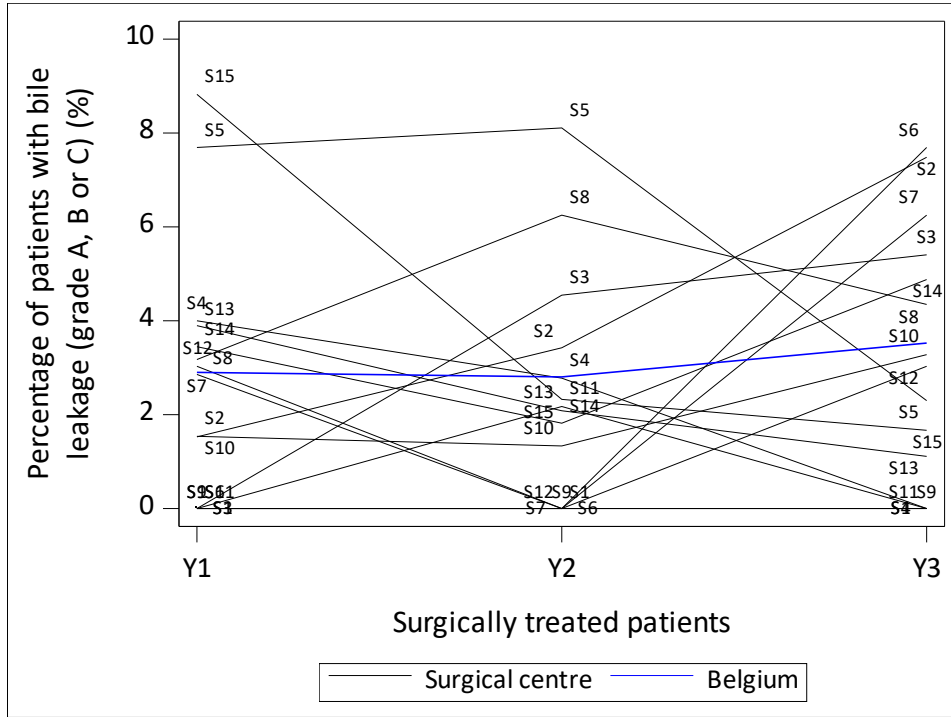
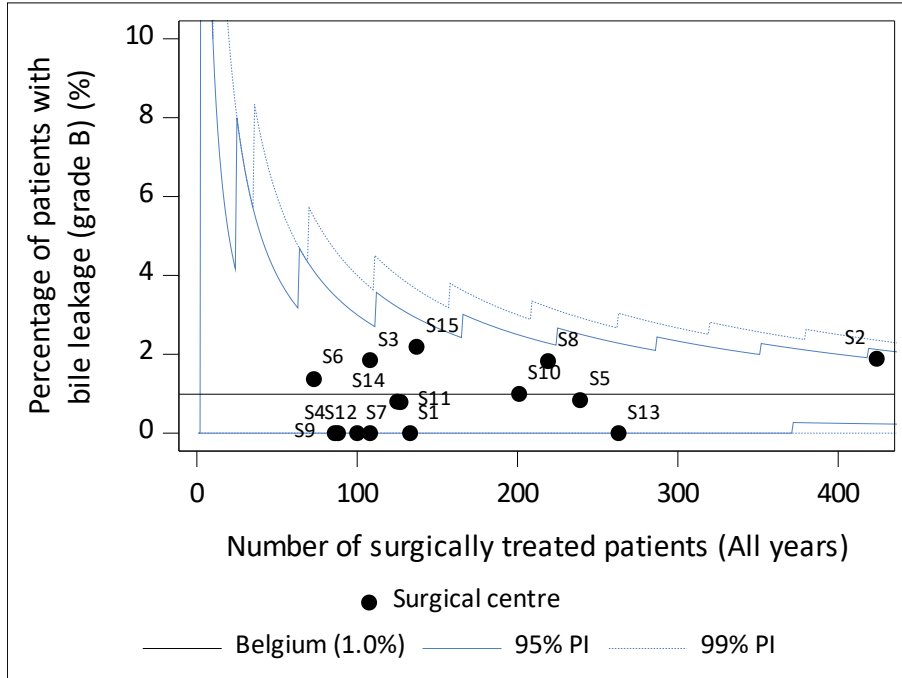


Figure 33: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

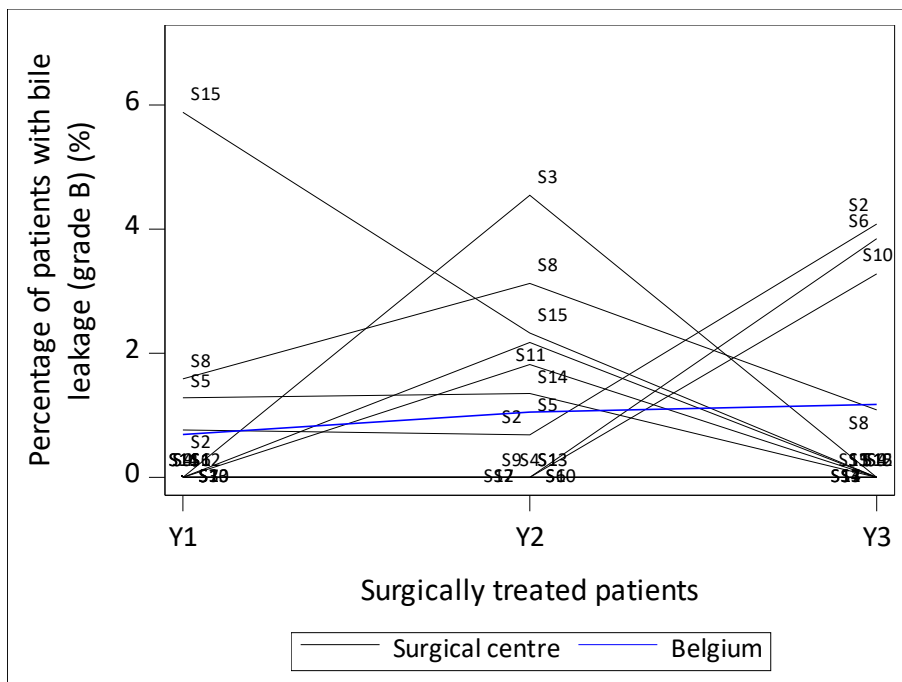
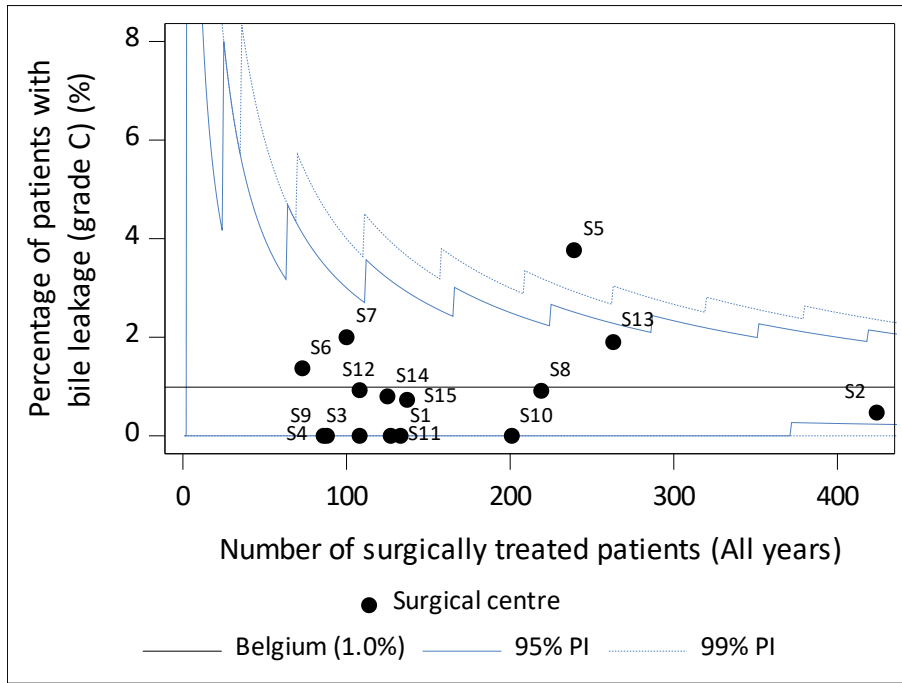


Figure 34: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours** with **bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

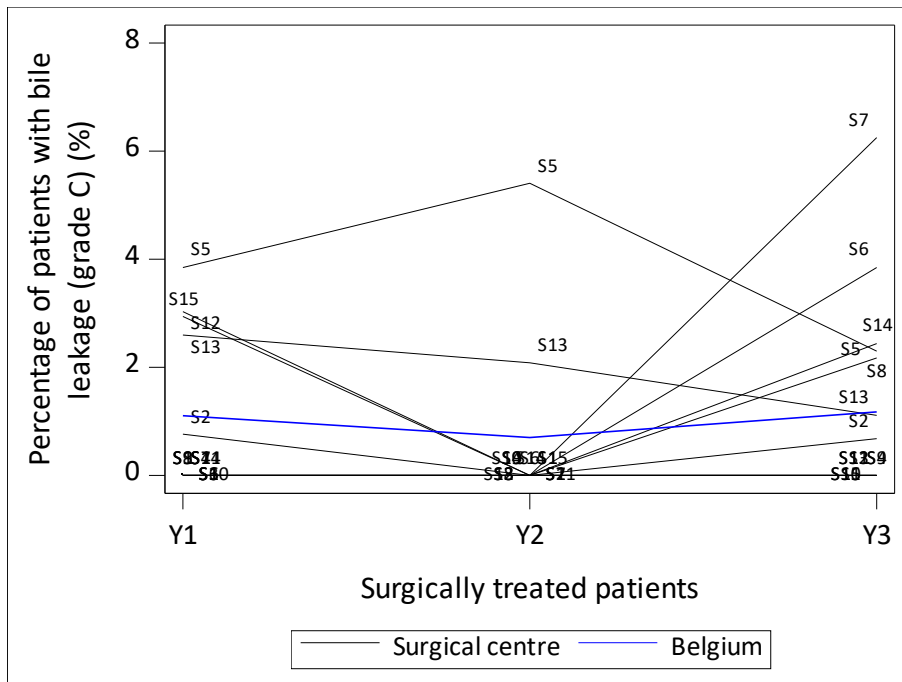
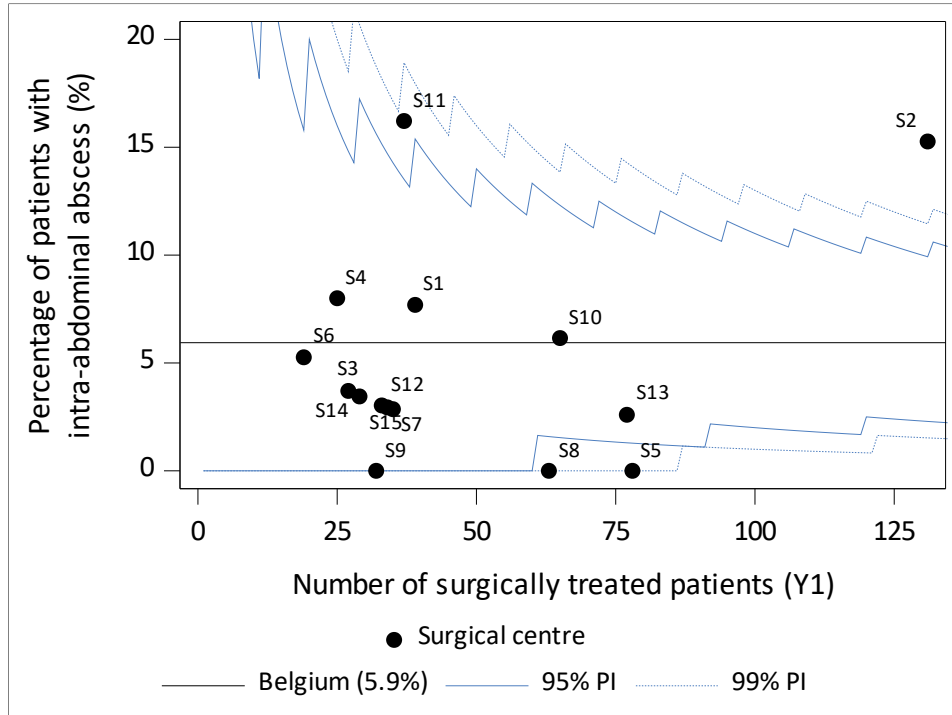
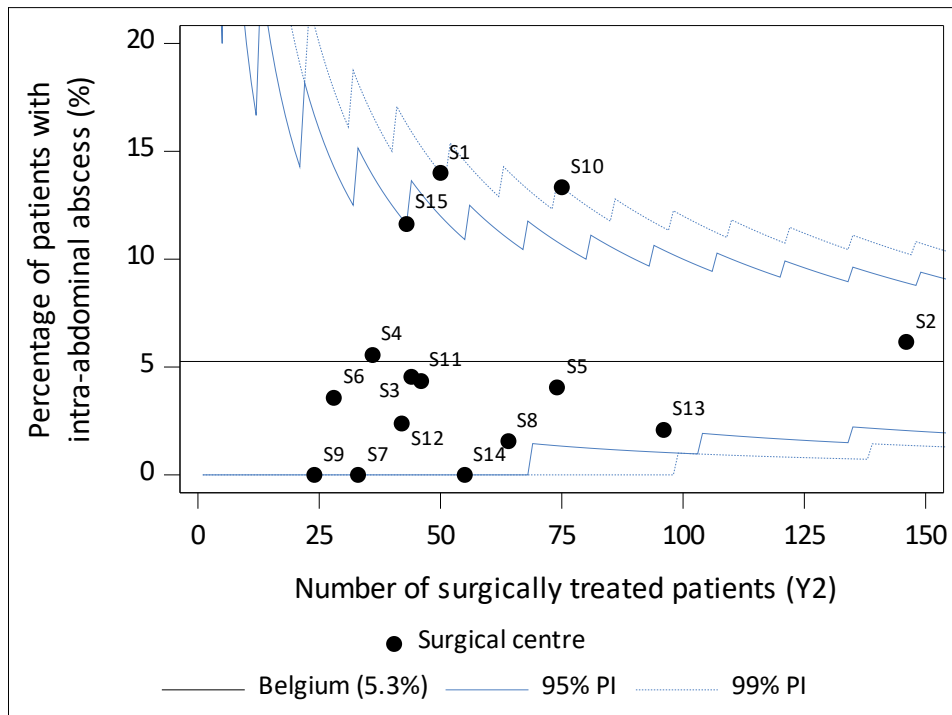


Figure 35: Funnel and spaghetti plot of surgically treated patients with **malignant and benign tumours with intra-abdominal abscess (within 90 days)**, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

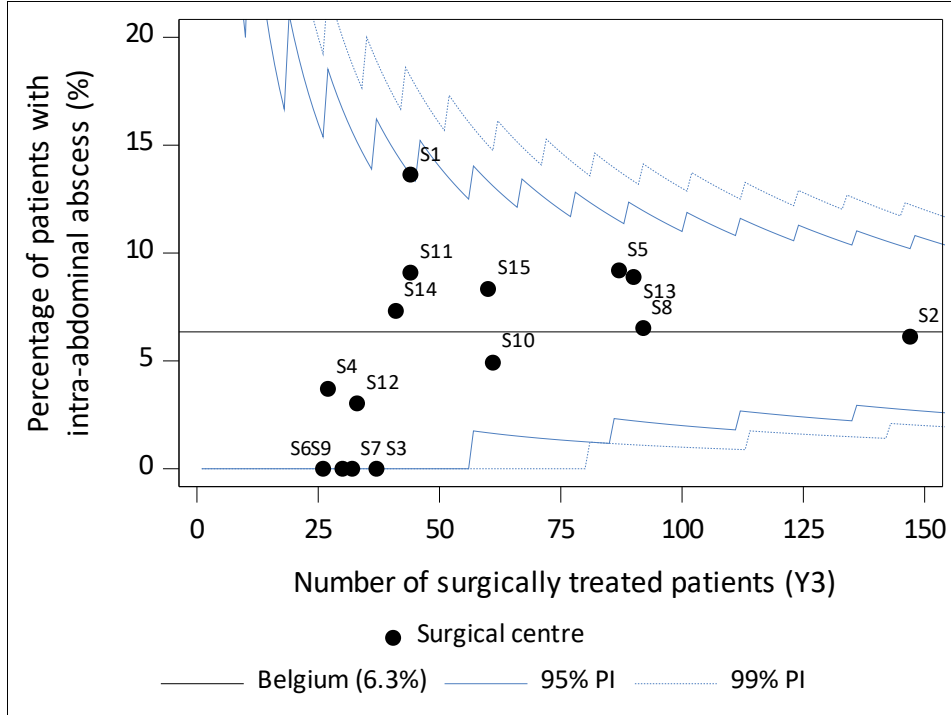
(a)



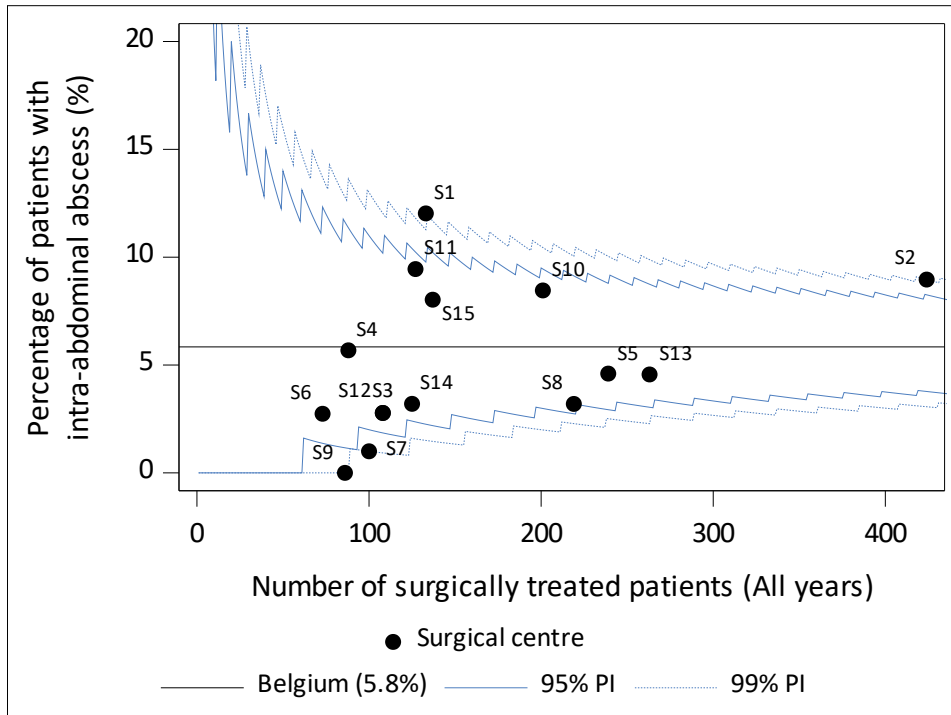
(b)



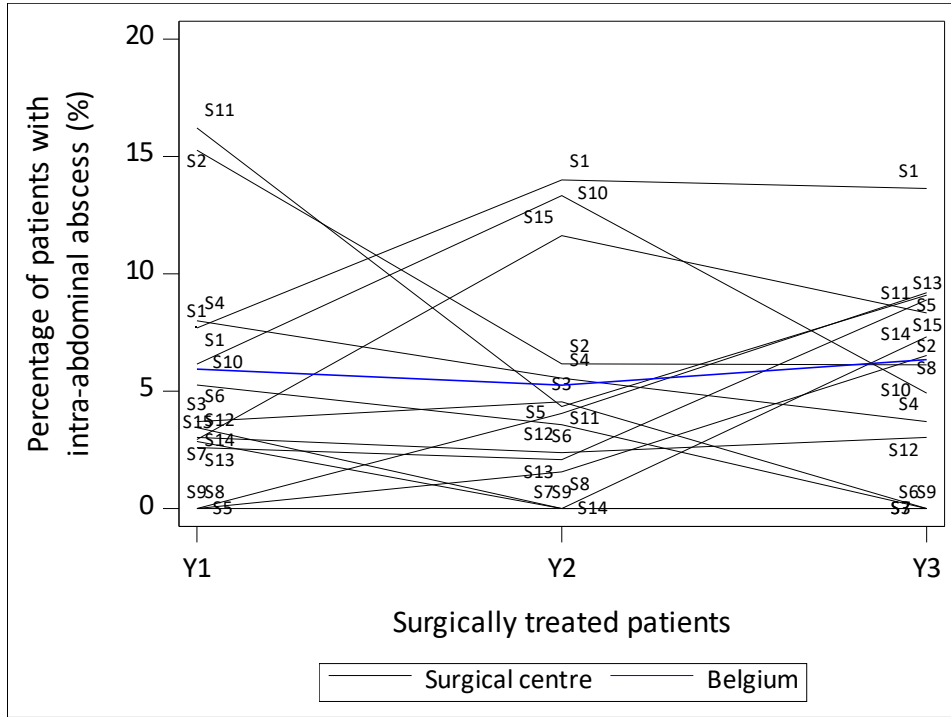
(c)



(d)



(e)



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

Table 24. Proportion of surgically treated patients with **malignant and benign tumours** in the three convention years with severe surgical complications, by patient and tumour characteristics.

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
Overall Y1+Y2+Y3	2,431	337	13.9	[12.5, 15.3]
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]
Sex				
Male	1,300	203	15.6	[13.7, 17.7]
Female	1,131	134	11.8	[10.0, 13.9]
Age at surgery				
<=69	1,393	173	12.4	[10.7, 14.3]
70-79	828	134	16.2	[13.7, 18.9]
>=80	210	30	14.3	[9.9, 19.8]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	2,362	324	13.7	[12.4, 15.2]
Relapse of primary tumour	40	6	15.0	[5.7, 29.8]
Metastasis	29	7	24.1	[10.3, 43.5]
Morphology				
Adenocarcinoma	1,590	232	14.6	[12.9, 16.4]
Neuroendocrine tumour	302	34	11.3	[7.9, 15.4]
Benign tumour	373	50	13.4	[10.1, 17.3]
Other or unspecified	166	21	12.7	[8.0, 18.7]
Primary tumour localisation				
C17.0 Duodenum	96	21	21.9	[14.1, 31.5]
C24.0 Extrahepatic bile duct	139	23	16.5	[10.8, 23.8]
C24.1 (Peri-) ampullary region	200	36	18.0	[12.9, 24.0]
C25.0 Head of pancreas	926	140	15.1	[12.9, 17.6]
C25.1 Body of pancreas	188	22	11.7	[7.5, 17.2]
C25.2 Tail of pancreas	291	22	7.6	[4.8, 11.2]
C25.3 Pancreatic duct	10	0	0.0	[0.0, 30.8]
C25.4 Islands of Langerhans	27	1	3.7	[0.1, 19.0]
C25.7-9 Other specified parts of pancreas	122	14	11.5	[6.4, 18.5]

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	N	Belgium		
		n	n/N (%)	95% CI
Other	59	8	13.6	[6.0, 25.0]
Missing or benign	373	50	13.4	[10.1, 17.3]
Clinical stage				
0	30	4	13.3	[3.8, 30.7]
I	939	127	13.5	[11.4, 15.9]
II	561	82	14.6	[11.8, 17.8]
III	200	24	12.0	[7.8, 17.3]
IV	55	7	12.7	[5.3, 24.5]
X	203	33	16.3	[11.5, 22.1]
TNM not applicable or relapse*	443	60	13.5	[10.5, 17.1]
Resection margin ^{##}				
R0	1,505	213	14.2	[12.4, 16.0]
R1	540	73	13.5	[10.7, 16.7]
R2	6	1	16.7	[0.4, 64.1]
Missing	7	0	0.0	[0.0, 41.0]
Prior surgery or other treatment ^{**}				
Prior abdominal surgery	357	50	14.0	[10.6, 18.0]
Other treatment modality (that could affect the pancreas)	282	45	16.0	[11.9, 20.8]
Neoadjuvant treatment				
Chemoradiotherapy	41	6	14.6	[5.6, 29.2]
Chemotherapy	317	37	11.7	[8.4, 15.7]
Radiotherapy	2	0	0.0	[0.0, 84.2]
No chemo or radiation treatment	2,071	294	14.2	[12.7, 15.8]
Charlson Comorbidity Index				
0	1,006	129	12.8	[10.8, 15.0]
1	571	75	13.1	[10.5, 16.2]
2	402	56	13.9	[10.7, 17.7]
3	202	34	16.8	[11.9, 22.7]
4	112	17	15.2	[9.1, 23.2]
5	49	12	24.5	[13.3, 38.9]
6	42	6	14.3	[5.4, 28.5]
7	21	3	14.3	[3.0, 36.3]
8	12	1	8.3	[0.2, 38.5]
9	8	2	25.0	[3.2, 65.1]
10	4	1	25.0	[0.6, 80.6]
11	1	0	0.0	[0.0, 97.5]
12	1	1	100.0	[2.5, 100.0]
WHO score at surgery				

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	N	Belgium		
		n	n/N (%)	95% CI
0 - Asymptomatic, normal activity	744	99	13.3	[10.9, 16.0]
1 - Symptomatic, but ambulant	1,421	188	13.2	[11.5, 15.1]
2 - Symptomatic, bedbound < 50% day	226	43	19.0	[14.1, 24.8]
3 - Symptomatic, bedbound > 50% day	38	6	15.8	[6.0, 31.3]
4 - Completely dependent, 100% bedbound	2	1	50.0	[1.3, 98.7]
ASA score				
1 - Healthy person	201	25	12.4	[8.2, 17.8]
2 - Mild systemic disease, normal activity	1,316	169	12.8	[11.1, 14.8]
3 - Serious systemic disease, limited activity	887	138	15.6	[13.2, 18.1]
4 - Life-threatening illness, handicapped	27	5	18.5	[6.3, 38.1]
Resectability status **				
Before neoadjuvant treatment				
Upfront resectable	45	5	11.1	[3.7, 24.1]
Borderline resectable	116	12	10.3	[5.5, 17.4]
Unresectable	41	4	9.8	[2.7, 23.1]
No neoadjuvant treatment	944	133	14.1	[11.9, 16.5]
Before surgery				
Upfront resectable	987	135	13.7	[11.6, 16.0]
Borderline resectable	146	18	12.3	[7.5, 18.8]
Unresectable	6	1	16.7	[0.4, 64.1]
Missing	7	0	0.0	[0.0, 41.0]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	724	79	10.9	[8.7, 13.4]
Minimally invasive surgery (MIS) - Hybrid	4	2	50.0	[6.8, 93.2]
Minimally invasive surgery (MIS) - Robotic	174	18	10.3	[6.2, 15.9]
Open	1,414	214	15.1	[13.3, 17.1]
Conversion from MIS to open surgery	115	24	20.9	[13.9, 29.4]
Simultaneous venous resection				
No	2,127	284	13.4	[11.9, 14.9]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	304	53	17.4	[13.3, 22.2]
- With primary wedge-reconstruction	89	15	16.9	[9.8, 26.3]
- With primary end-to-end reconstruction	146	23	15.8	[10.3, 22.7]
- With vascular autograft interposition	7	2	28.6	[3.7, 71.0]
- With vascular allograft interposition	21	5	23.8	[8.2, 47.2]
- With synthetic/prosthetic interposition	6	2	33.3	[4.3, 77.7]
- With peritoneal patch wedge-reconstruction	31	6	19.4	[7.5, 37.5]
- Without reconstruction	4	0	0.0	[0.0, 60.2]

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
<i>Simultaneous arterial resection **</i>				
No	2,386	332	13.9	[12.5, 15.4]
Hepatic artery resection	18	2	11.1	[1.4, 34.7]
- With primary end-to-end reconstruction	12	2	16.7	[2.1, 48.4]
- With vascular allograft interposition	1	0	0.0	[0.0, 97.5]
- Without reconstruction	5	0	0.0	[0.0, 52.2]
Coeliac trunk resection	20	2	10.0	[1.2, 31.7]
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]
- Without reconstruction	19	2	10.5	[1.3, 33.1]
Superior mesenteric artery (SMA) resection	6	1	16.7	[0.4, 64.1]
- With primary wedge-reconstruction	1	0	0.0	[0.0, 97.5]
- With primary end-to-end reconstruction	1	0	0.0	[0.0, 97.5]
- With vascular autograft interposition	2	1	50.0	[1.3, 98.7]
- Without reconstruction	2	0	0.0	[0.0, 84.2]
<i>Simultaneous other organ resection **</i>				
No	1,522	229	15.0	[13.3, 16.9]
Colon	56	15	26.8	[15.8, 40.3]
Stomach	333	49	14.7	[11.1, 19.0]
Adrenal gland	47	2	4.3	[0.5, 14.5]
Spleen	478	40	8.4	[6.0, 11.2]
Other	171	21	12.3	[7.8, 18.2]
<i>RIZIV code for complex surgery</i>				
242830-242841: Pancreaticoduodenectomy	1,646	272	16.5	[14.8, 18.4]
Pancreaticoduodenectomy	1,504	244	16.2	[14.4, 18.2]
Total Pancreatectomy	142	28	19.7	[13.5, 27.2]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	225	26	11.6	[7.7, 16.5]
242874-242885: Hemipancreatectomy left	517	33	6.4	[4.4, 8.8]
242896-242900: Enucleation of a pancreatic tumour	43	6	14.0	[5.3, 27.9]
<i>Antithrombotic medication</i>				
No	1,717	223	13.0	[11.4, 14.7]
Yes	714	114	16.0	[13.4, 18.9]
<i>Was the patient referred?</i>				
No	1,098	148	13.5	[11.5, 15.6]
Yes	1,333	189	14.2	[12.3, 16.2]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI

* 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 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. Descriptives

4.1.1. Patient case mix description

Table 25. Case mix description of all patients discussed on a MC (with and without surgery).

Characteristic	Belgium (N=803)					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>N patients discussed on a MC</i>	224		254		325	
<i>Expert centres</i>						
S1	15	6.7	25	9.8	40	12.3
S2	10	4.5	26	10.2	44	13.5
S3	9	4.0	4	1.6	1	0.3
S4	5	2.2	1	0.4	1	0.3
S5	10	4.5	15	5.9	19	5.8
S6	13	5.8	26	10.2	20	6.2
S7	24	10.7	25	9.8	42	12.9
S8	13	5.8	9	3.5	6	1.8
S9	37	16.5	23	9.1	20	6.2
S10	7	3.1	10	3.9	16	4.9
S11	8	3.6	19	7.5	27	8.3
S12	4	1.8	4	1.6	1	0.3
S13	42	18.8	25	9.8	43	13.2
S14	10	4.5	18	7.1	16	4.9
S15	17	7.6	24	9.4	29	8.9
<i>Sex</i>						
Male	152	67.9	168	66.1	200	61.5
Female	72	32.1	86	33.9	125	38.5
<i>Age at MC</i>						
<=69	167	74.6	186	73.2	224	68.9
70-79	39	17.4	51	20.1	72	22.2
>=80	16	7.1	14	5.5	26	8.0
Missing	2	0.9	3	1.2	3	0.9
<i>Indication</i>						
Pancreatitis	111	49.6	151	59.4	156	48.0
Other	113	50.4	103	40.6	169	52.0

Characteristic	Belgium (N=803)					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
Was the patient referred?						
No	154	68.8	174	68.5	220	67.7
Yes	70	31.3	79	31.1	105	32.3
Missing	0	0.0	1	0.4	0	0.0

Table 26. Case mix description of all patients discussed on a MC who underwent surgical treatment.

Characteristic	Belgium (N=204)					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
N patients with surgery	63		72		69	
Expert centres						
S1	6	9.5	6	8.3	3	4.3
S2	4	6.3	8	11.1	14	20.3
S3	3	4.8	1	1.4	0	0.0
S4	3	4.8	1	1.4	1	1.4
S5	7	11.1	9	12.5	11	15.9
S6	2	3.2	0	0.0	1	1.4
S7	1	1.6	3	4.2	1	1.4
S8	2	3.2	5	6.9	3	4.3
S9	3	4.8	3	4.2	3	4.3
S10	5	7.9	5	6.9	3	4.3
S11	7	11.1	6	8.3	7	10.1
S12	4	6.3	4	5.6	1	1.4
S13	10	15.9	10	13.9	17	24.6
S14	1	1.6	3	4.2	0	0.0
S15	5	7.9	8	11.1	4	5.8
Sex						
Male	42	66.7	50	69.4	47	68.1
Female	21	33.3	22	30.6	22	31.9
Age at surgery						
<=69	56	88.9	63	87.5	62	89.9
70-79	7	11.1	9	12.5	6	8.7
>=80	0	0.0	0	0.0	1	1.4
Indication						
Pancreatitis	36	57.1	51	70.8	44	63.8

Characteristic	Belgium (N=204)					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
Other	27	42.9	21	29.2	25	36.2
Prior surgery or other treatment **						
Prior abdominal surgery	10	15.9	15	20.8	19	27.5
Other treatment modality (that could affect the pancreas)	11	17.5	18	25.0	14	20.3
Charlson Comorbidity Index						
0	22	34.9	30	41.7	31	44.9
1	18	28.6	17	23.6	13	18.8
2	13	20.6	9	12.5	8	11.6
3	4	6.3	8	11.1	9	13.0
4	3	4.8	5	6.9	4	5.8
5	0	0.0	1	1.4	2	2.9
6	3	4.8	1	1.4	0	0.0
9	0	0.0	0	0.0	1	1.4
10	0	0.0	0	0.0	1	1.4
11	0	0.0	1	1.4	0	0.0
WHO score at surgery						
0 - Asymptomatic, normal activity	11	17.5	15	20.8	21	30.4
1 - Symptomatic, but ambulant	39	61.9	49	68.1	38	55.1
2 - Symptomatic, bedbound < 50% day	9	14.3	7	9.7	8	11.6
3 - Symptomatic, bedbound > 50% day	3	4.8	1	1.4	1	1.4
4 - Completely dependent, 100% bedbound	1	1.6	0	0.0	1	1.4
ASA score						
1 - Healthy person	5	7.9	3	4.2	4	5.8
2 - Mild systemic disease, normal activity	34	54.0	40	55.6	34	49.3
3 - Serious systemic disease, limited activity	21	33.3	28	38.9	30	43.5
4 - Life-threatening illness, handicapped	3	4.8	1	1.4	1	1.4
Type of surgery						
Minimally invasive surgery (MIS) – Laparoscopic	15	23.8	13	18.1	18	26.1
Minimally invasive surgery (MIS) - Hybrid	0	0.0	1	1.4	1	1.4
Minimally invasive surgery (MIS) - Robotic	3	4.8	8	11.1	5	7.2
Open	45	71.4	46	63.9	40	58.0
Conversion from MIS to open surgery	0	0.0	4	5.6	5	7.2
Simultaneous vascular resection						
No vascular reconstruction	60	95.2	69	95.8	69	100.0
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	3	4.8	3	4.2	0	0.0
Simultaneous other organ resection **						
No	42	66.7	42	58.3	40	58.0

Characteristic	Belgium (N=204)					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
Colon	1	1.6	4	5.6	3	4.3
Stomach	6	9.5	9	12.5	8	11.6
Adrenal gland	1	1.6	2	2.8	3	4.3
Spleen	14	22.2	19	26.4	19	27.5
Other	6	9.5	5	6.9	6	8.7
RIZIV code for complex surgery						
242830-242841: Pancreaticoduodenectomy	37	58.7	40	55.6	38	55.1
Pancreaticoduodenectomy	34	91.9	35	87.5	35	92.1
Total Pancreatectomy	3	8.1	5	12.5	3	7.9
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	5	7.9	13	18.1	12	17.4
242874-242885: Hemipancreatectomy left	21	33.3	19	26.4	18	26.1
242896-242900: Enucleation of a pancreatic tumour	0	0.0	0	0.0	1	1.4
Antithrombotic medication						
No	50	79.4	57	79.2	53	76.8
Yes	13	20.6	15	20.8	16	23.2
Was the patient referred?						
No	39	61.9	41	56.9	43	62.3
Yes	24	38.1	31	43.1	26	37.7

** 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 third convention year.

Table 27. Completeness of registration forms: number of registrations in complex surgery database that were complete in the third convention year, by surgery type and by expert centre.

Patient group	Belgium		
	N registered	n complete	n/N (%)
<i>N patients discussed on a MC in Year 3</i>	325	325	100.0
<i>Surgery status</i>			
N patients with surgery	69	69	100.0
N patients without surgery	256	256	100.0
<i>Expert centres</i>			
S1	40	40	100.0
S2	44	44	100.0
S3	1	1	100.0
S4	1	1	100.0
S5	19	19	100.0
S6	20	20	100.0
S7	42	42	100.0
S8	6	6	100.0
S9	20	20	100.0
S10	16	16	100.0
S11	27	27	100.0
S12	1	1	100.0
S13	43	43	100.0
S14	16	16	100.0
S15	29	29	100.0

4.2. Process indicators

4.2.1. Length of stay in the expert centre

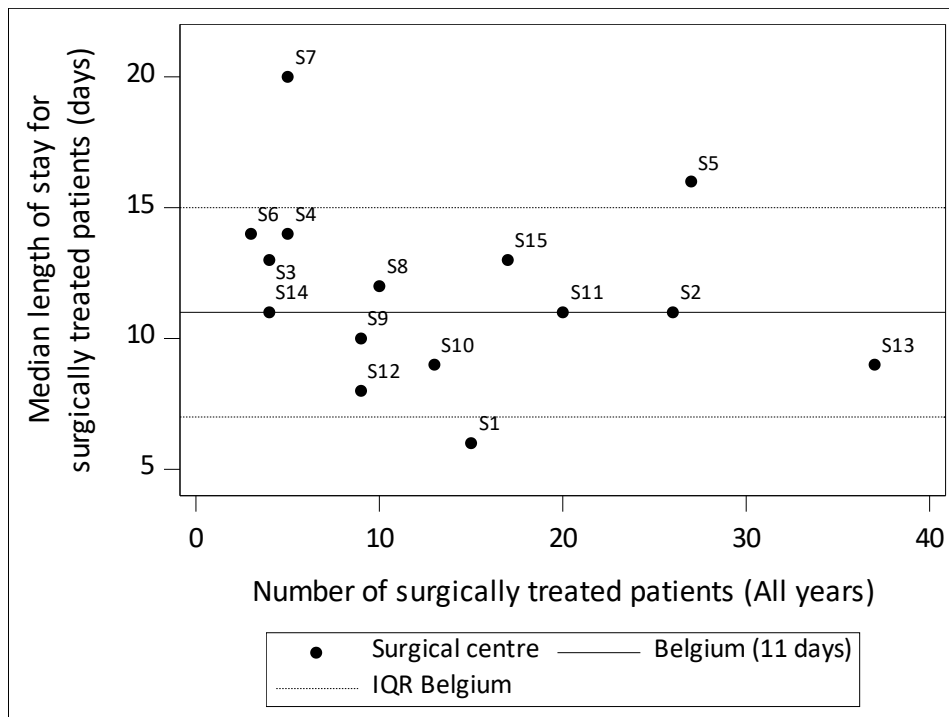
Table 28. Length of stay for patients surgically treated in an expert centre in the three convention years.

Characteristic	N	Belgium	
		Median (days)	IQR*
Length of stay from surgery to discharge Y1+Y2+Y3¹	204	11	[7, 15]
Convention year			
Year 1	63	12	[9, 15]
Year 2	72	12	[7, 16]
Year 3	69	10	[7, 14]

¹ length of stay longer than 90 days was truncated at 90 days.
 * Interquartile Range= [the 25th, and 75th percentiles of the data]

Figure 36: Median length of stay for surgically treated patients, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined.

(a)



4.3. Outcome indicators

4.3.1. Postoperative mortality

4.3.1.1. Unadjusted 30-day postoperative mortality

There were only 2 postoperative deaths observed for all hospitals combined (N=1 for Y1, N=1 for Y2 and N=0 for Y3), therefore no results are given.

4.3.1.2. Unadjusted 90-day postoperative mortality

There were only 5 postoperative deaths observed for all hospitals combined (N=3 for Y1, N=2 for Y2 and N=0 for Y3), 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 11 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2 and N=3 for Y3), therefore no results are given.

4.3.2.2. Unadjusted 1-year relative survival after surgery

There were only 11 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2 and N=3 for Y3), therefore no results are given.

4.3.3. Proportion of surgically treated 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 29. Proportion of surgically treated patients with surgical complications in the three convention years (90-day postoperative, in-hospital), by complication type.

Complication type	Postoperative complications (90-day in-hospital)			
	Belgium			
	N	n	n/N (%)	95% CI
<i>Severe postoperative complications (CD IIIb-V)</i>	204	23	11.3	[7.3, 16.4]
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]
<i>Clinically relevant pancreatic fistula (Grade B or C) ^{1*}</i>	204	26	12.7	[8.5, 18.1]
Grade B	204	23	11.3	[7.3, 16.4]
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]
Grade C	204	3	1.5	[0.3, 4.2]
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]
<i>Haemorrhage (Grade A, B or C) ^{2*}</i>	204	8	3.9	[1.7, 7.6]
Grade A	204	1	0.5	[0.0, 2.7]
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]
Grade B	204	6	2.9	[1.1, 6.3]
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]
Grade C	204	1	0.5	[0.0, 2.7]
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]
<i>Delayed gastric emptying (Grade A, B or C) ^{3*}</i>	204	22	10.8	[6.9, 15.9]
Grade A	204	11	5.4	[2.7, 9.4]
Year 1	63	2	3.2	[0.4, 11.0]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI
Year 2	72	8	11.1	[4.9, 20.7]
Year 3	69	1	1.4	[0.0, 7.8]
Grade B	204	8	3.9	[1.7, 7.6]
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]
Grade C	204	3	1.5	[0.3, 4.2]
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]
<i>Bile leakage (Grade A, B or C) ^{4*}</i>	204	2	1.0	[0.1, 3.5]
Grade A	204	0	0.0	[0.0, 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]
Grade B	204	1	0.5	[0.0, 2.7]
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]
Grade C	204	1	0.5	[0.0, 2.7]
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]
<i>Intra-abdominal abscess *</i>	204	15	7.4	[4.2, 11.8]
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]
<i>Transferred to another hospital due to complications (CD I-IVb)</i>	204	1	0.5	[0.0, 2.7]
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]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n	n/N (%)	95% CI

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)

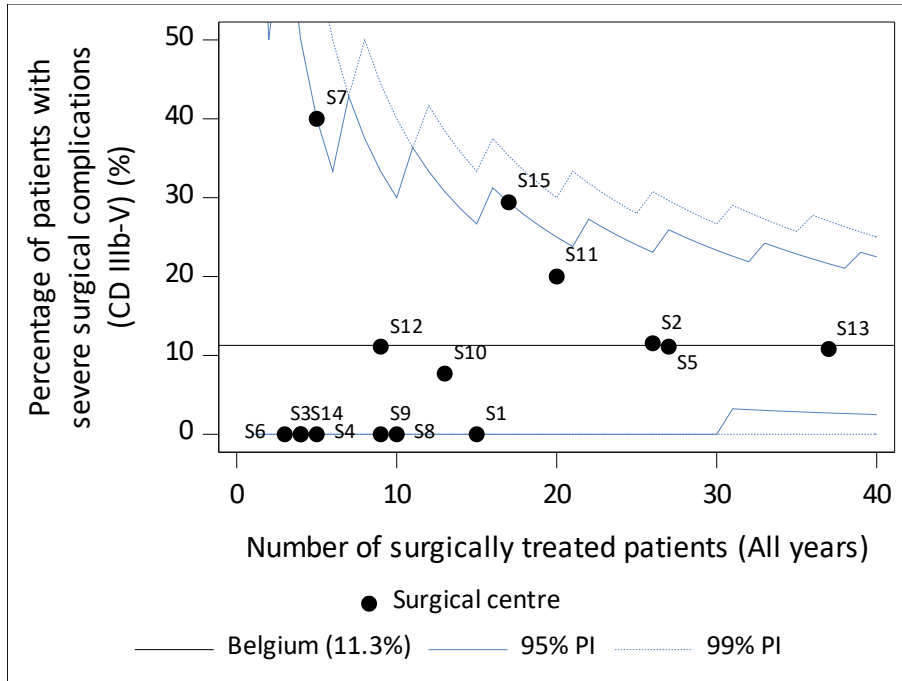
More information can be found in the project manual.

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

the total number of patients.

Figure 37: Funnel and spaghetti plot of surgically treated patients with **severe surgical complications (CD IIIb-V)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

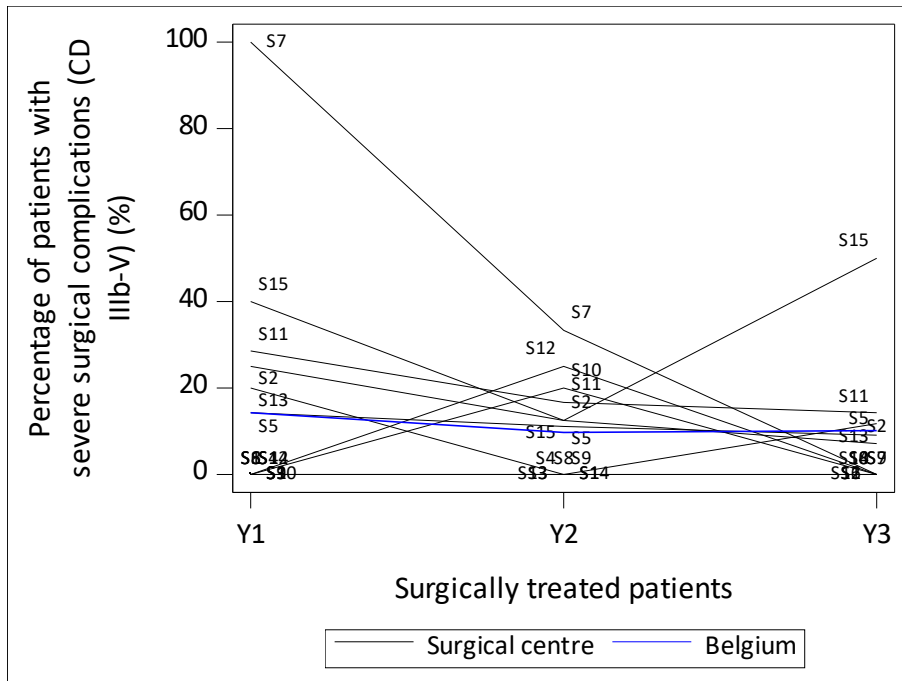
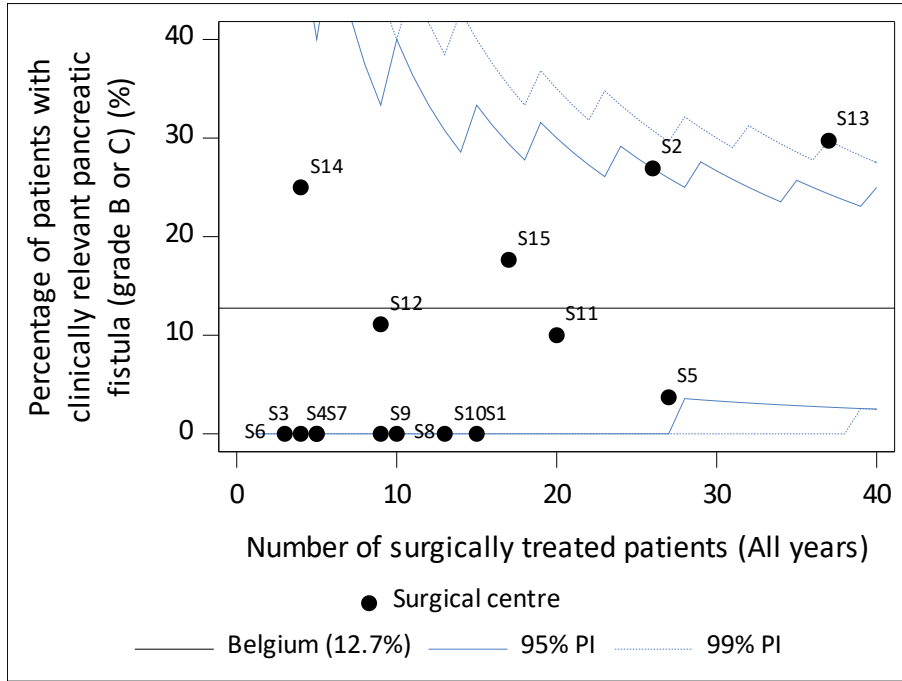


Figure 38: Funnel and spaghetti plot of surgically treated patients with **clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

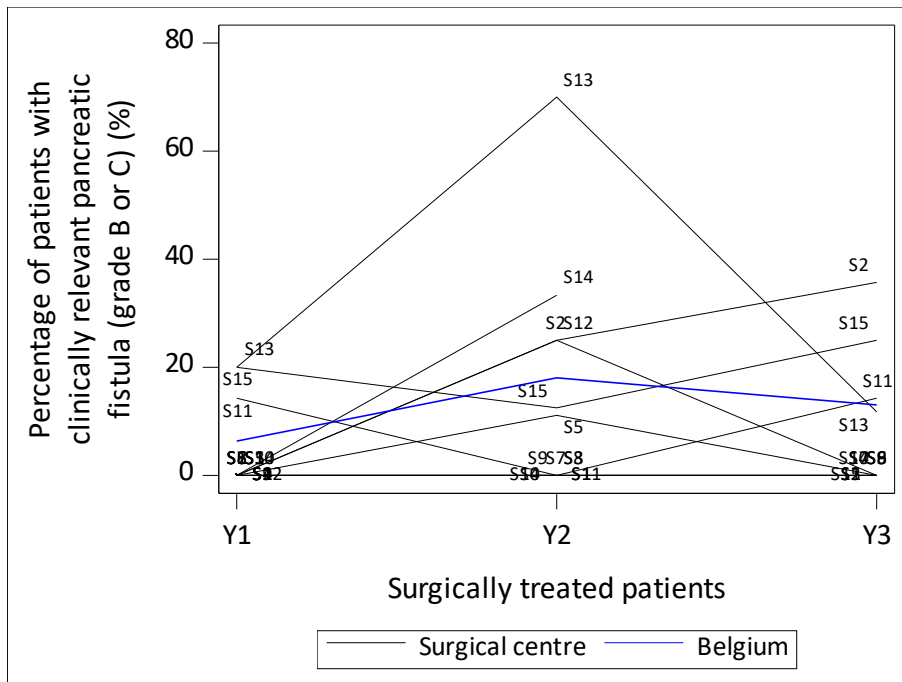
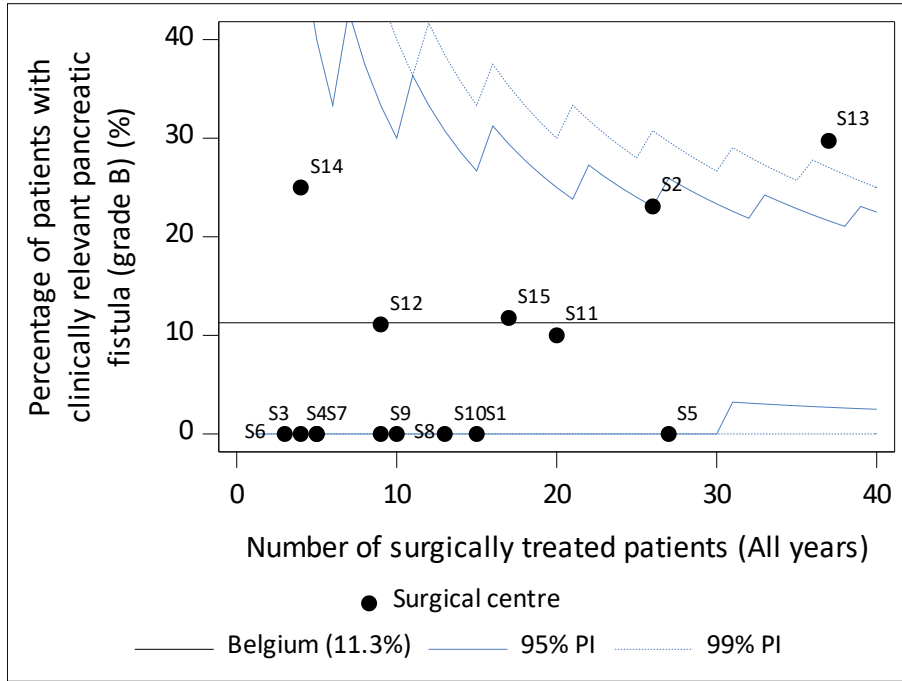


Figure 39: Funnel and spaghetti plot of surgically treated patients with **clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

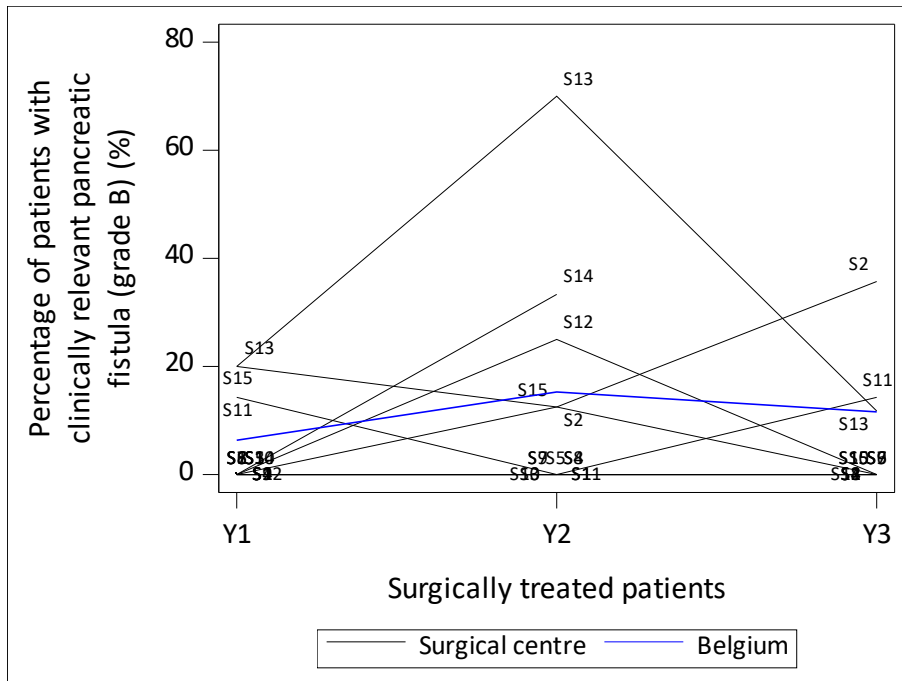
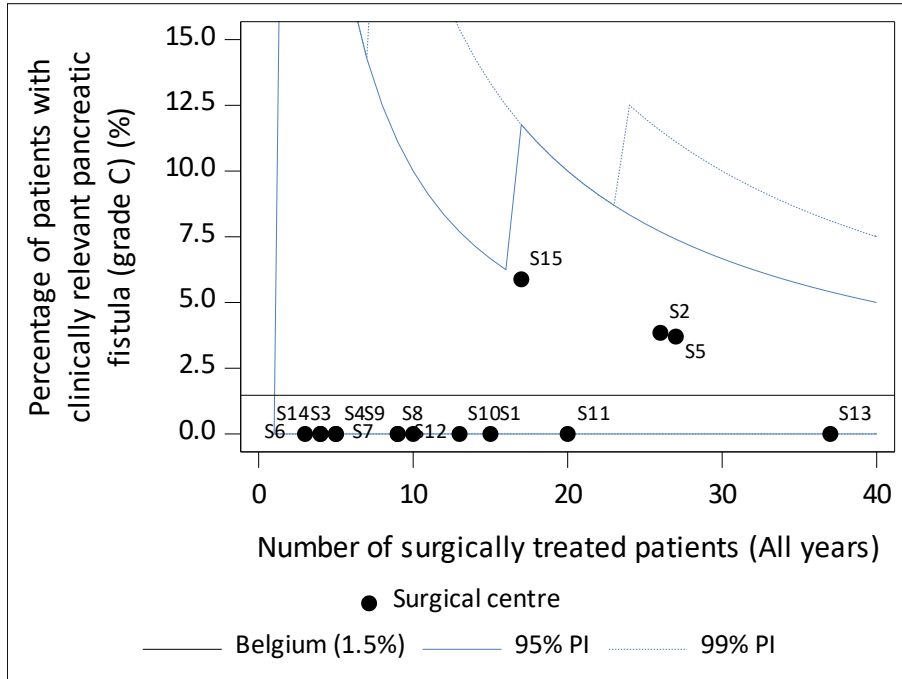


Figure 40: Funnel and spaghetti plot of surgically treated patients with **clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

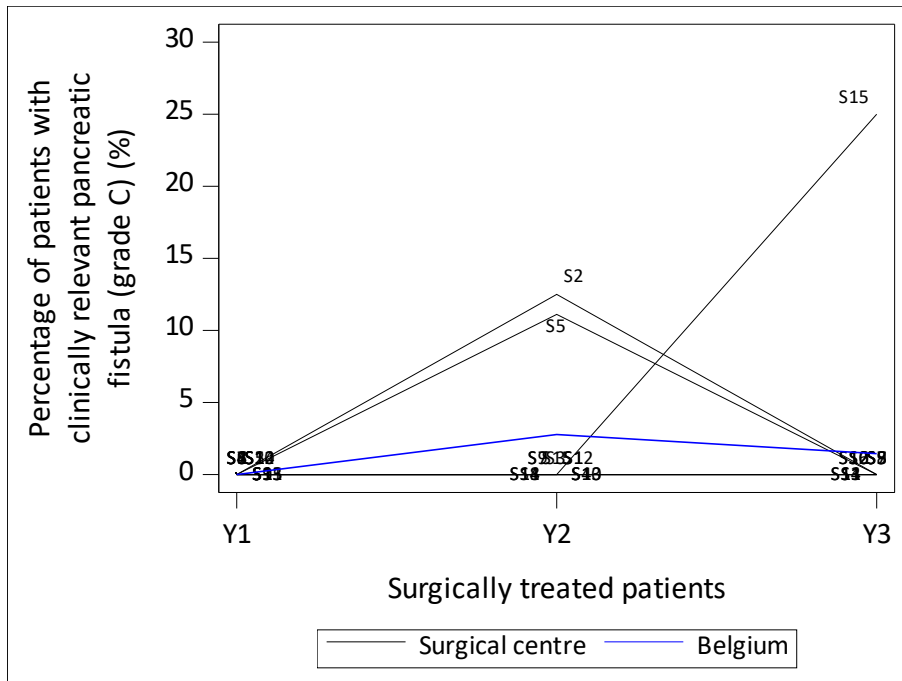
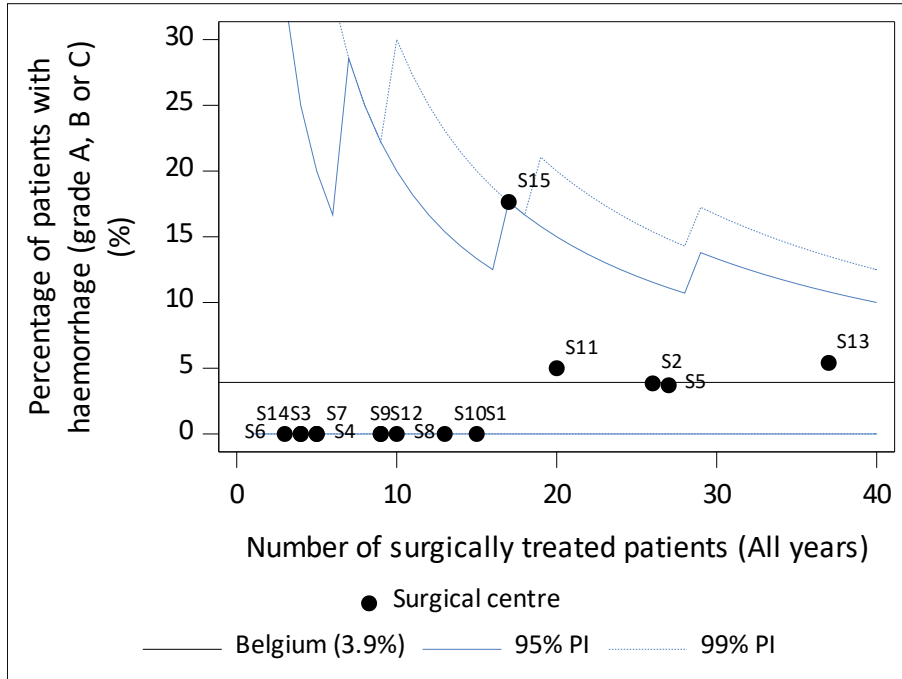


Figure 41: Funnel and spaghetti plot of surgically treated patients with **haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

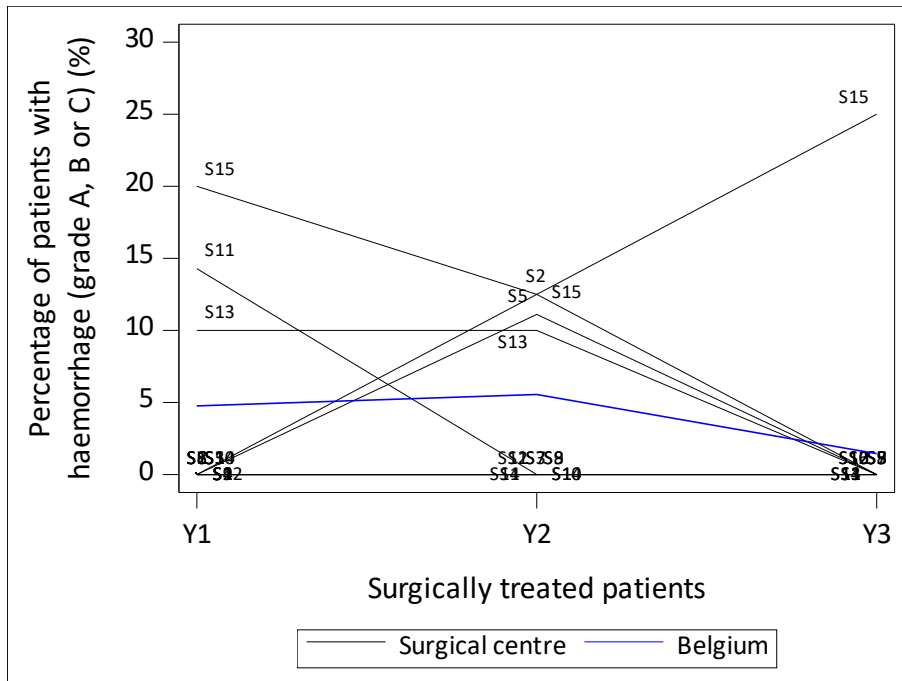
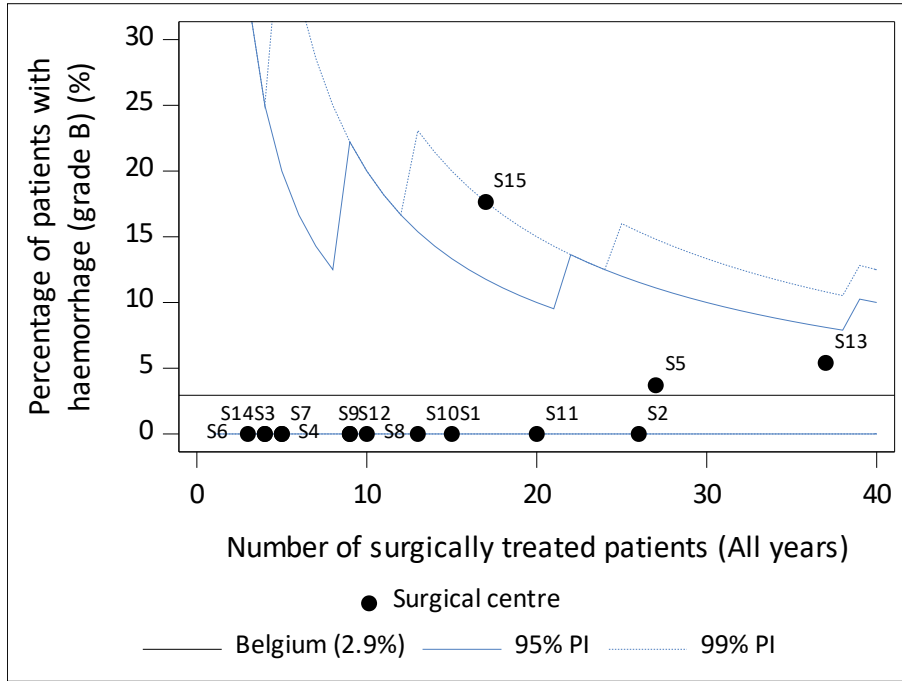


Figure 42: Funnel and spaghetti plot of surgically treated patients with **haemorrhage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

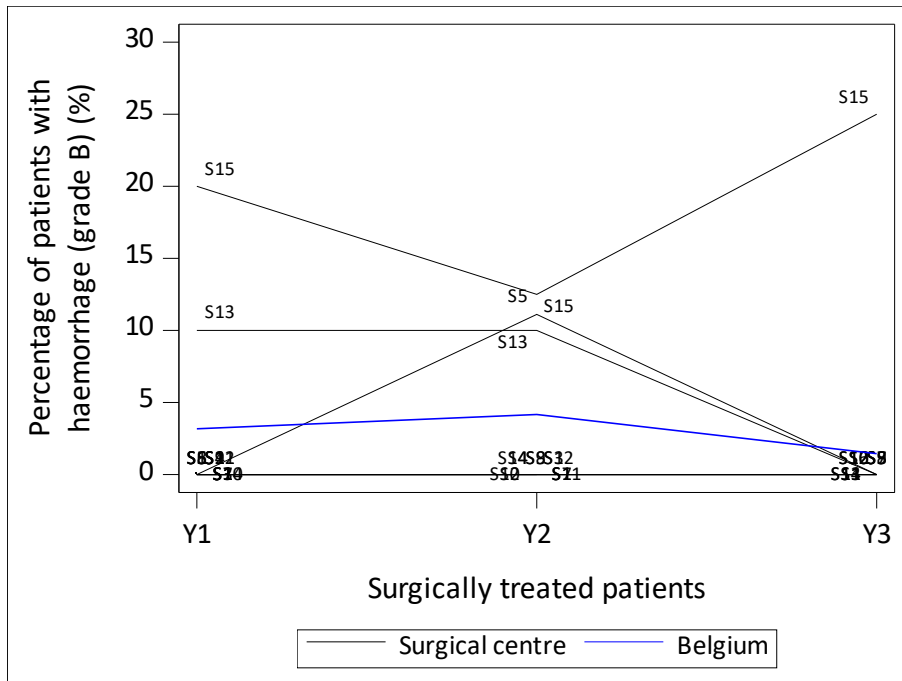
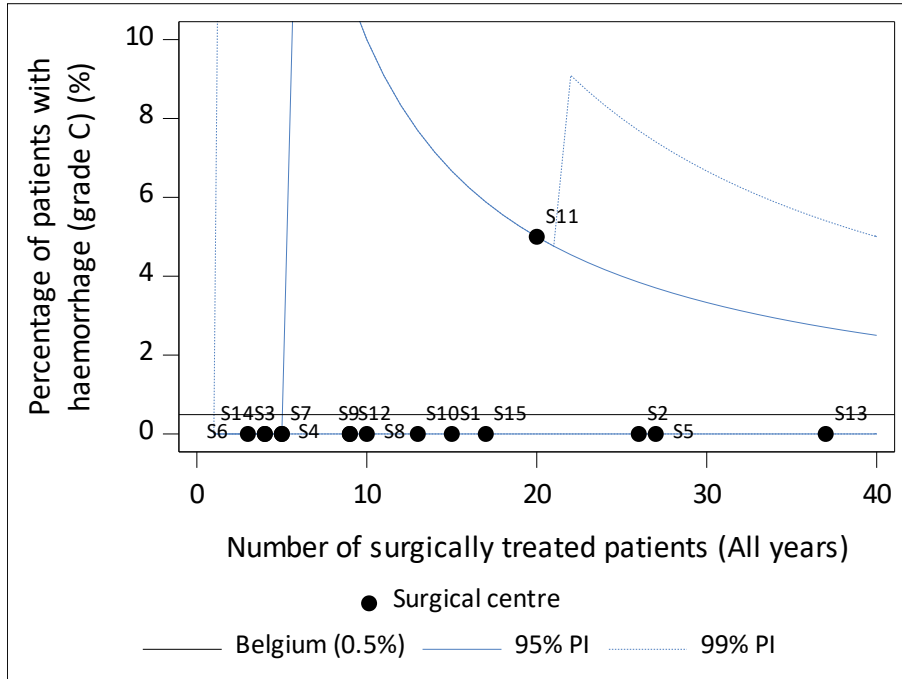


Figure 43: Funnel and spaghetti plot of surgically treated patients with **haemorrhage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

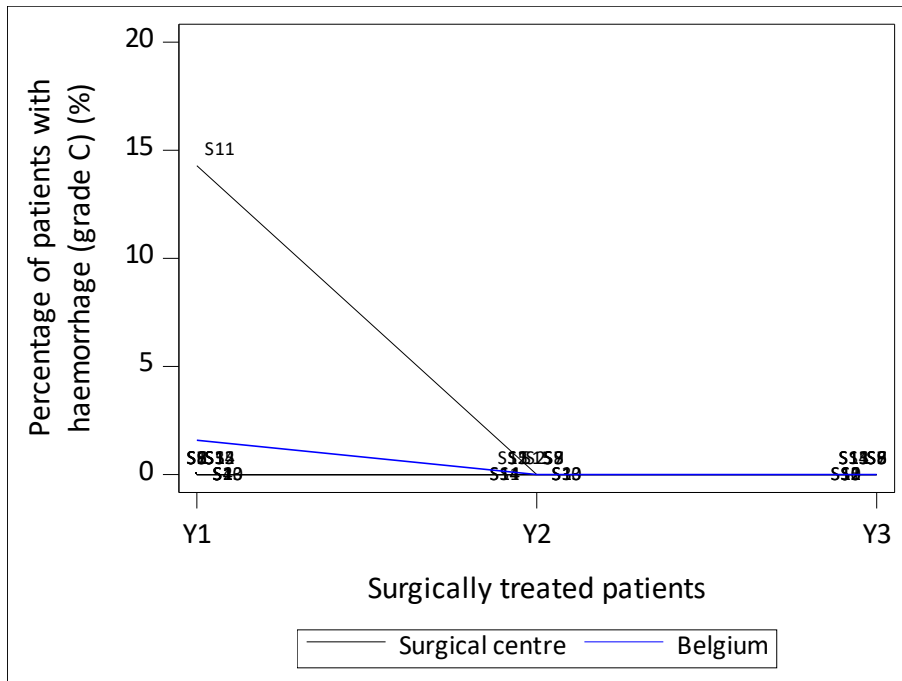
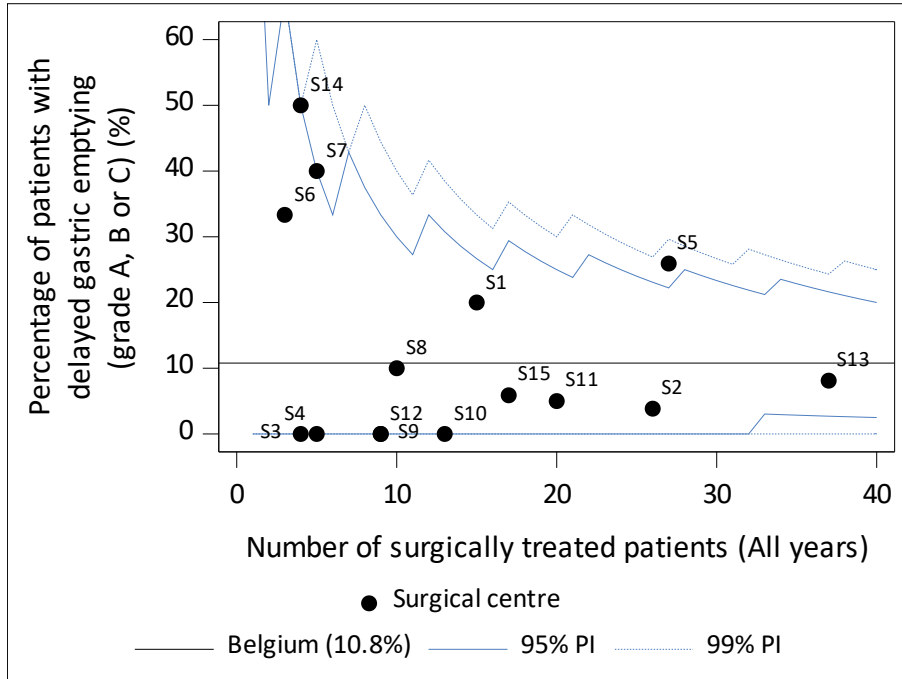


Figure 44: Funnel and spaghetti plot of surgically treated patients with **delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

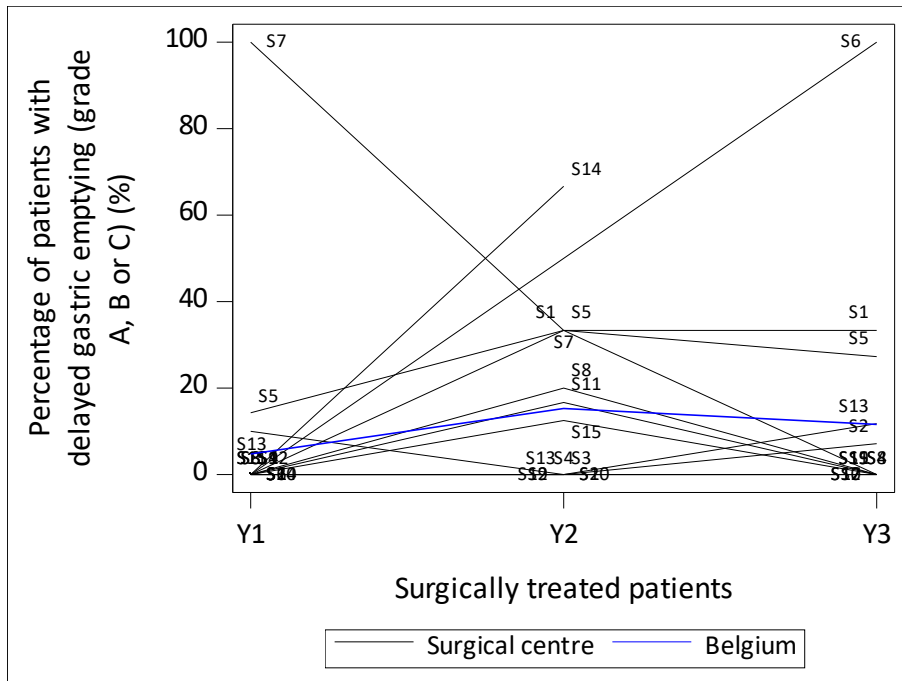
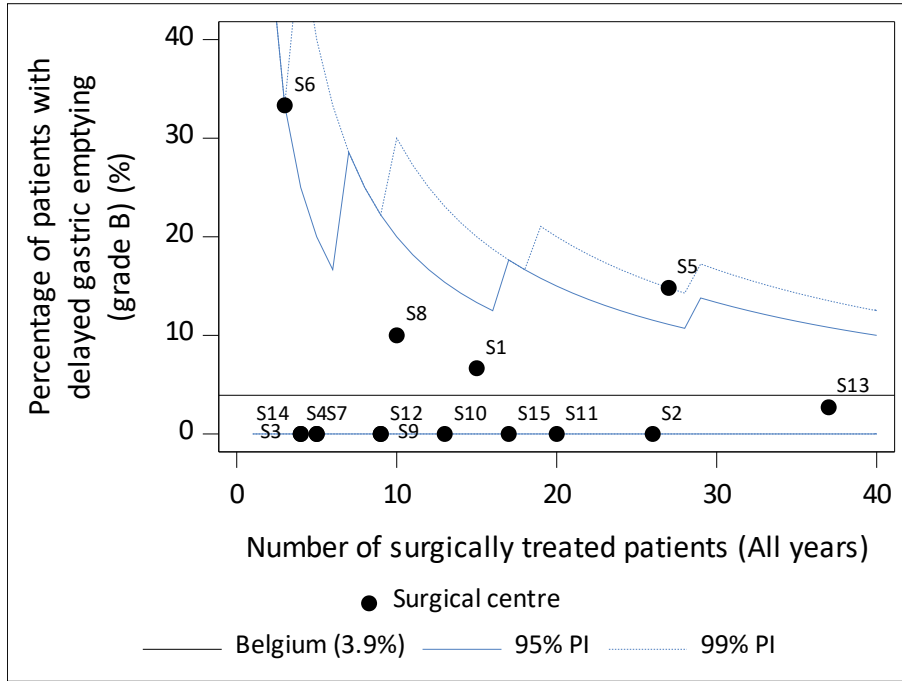


Figure 45: Funnel and spaghetti plot of surgically treated patients with **delayed gastric emptying (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

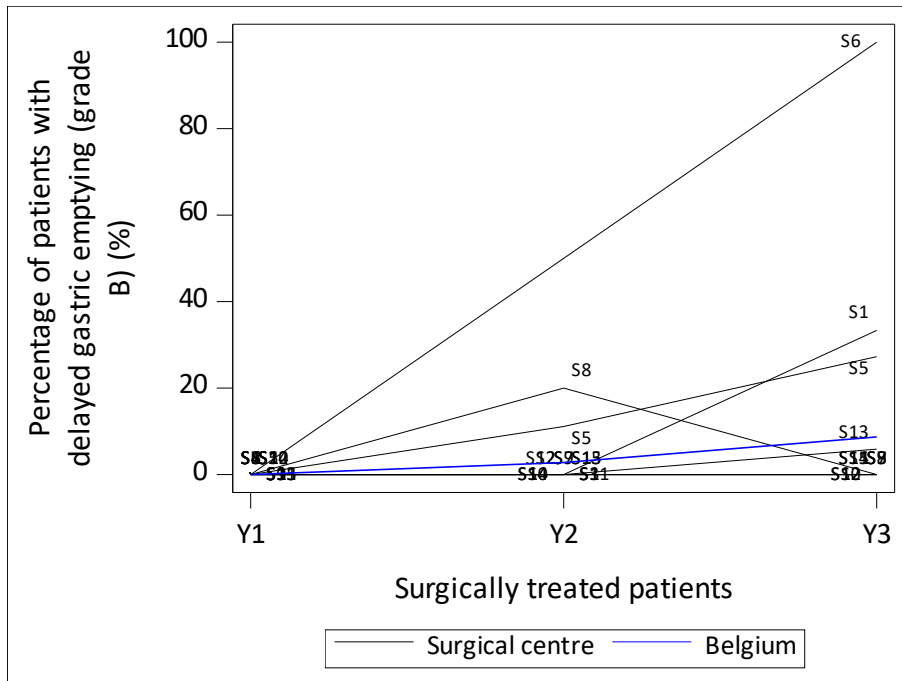
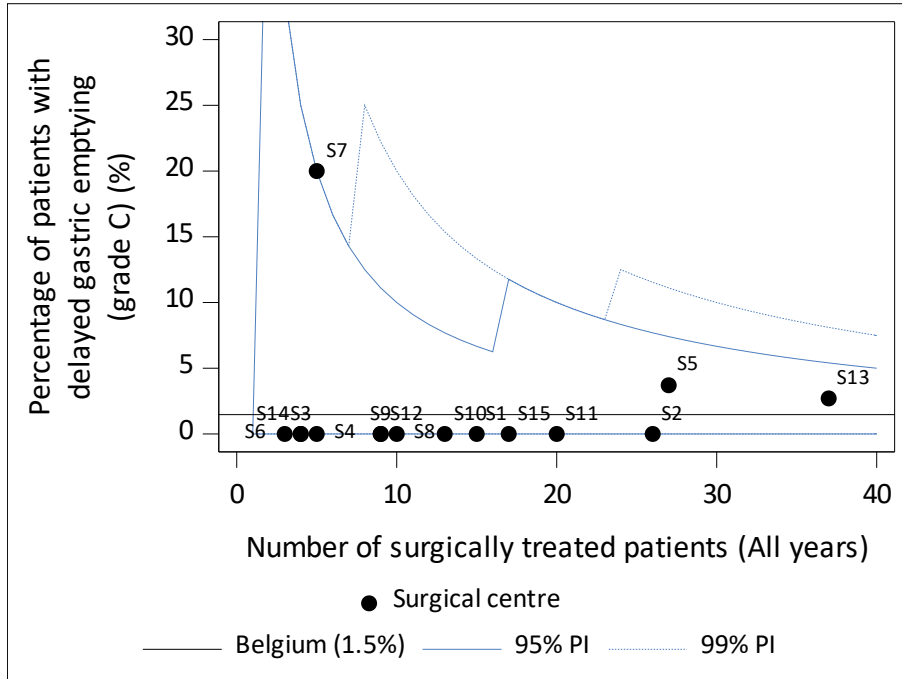


Figure 46: Funnel and spaghetti plot of surgically treated patients with **delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

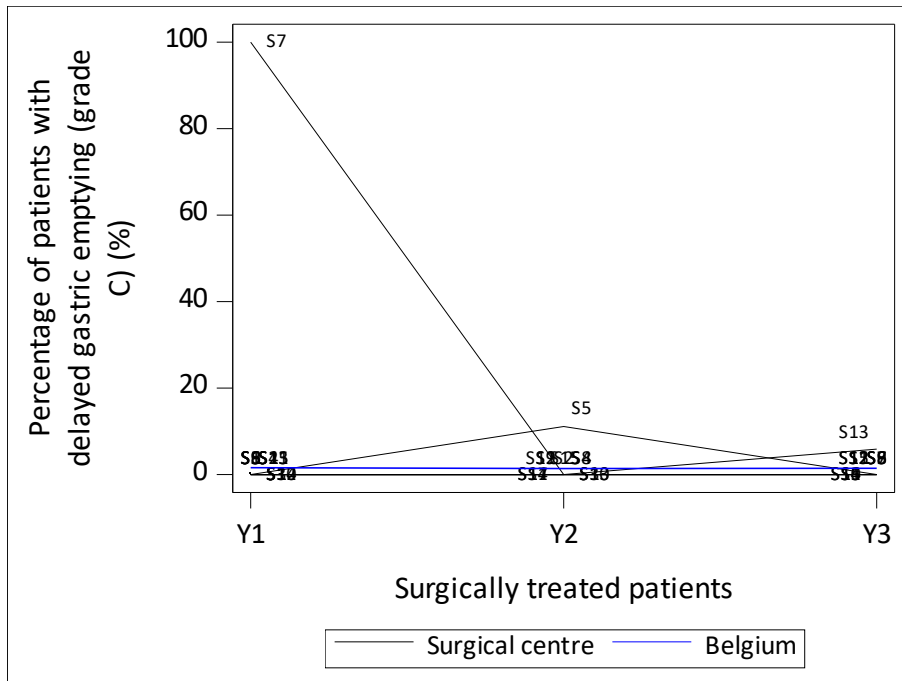
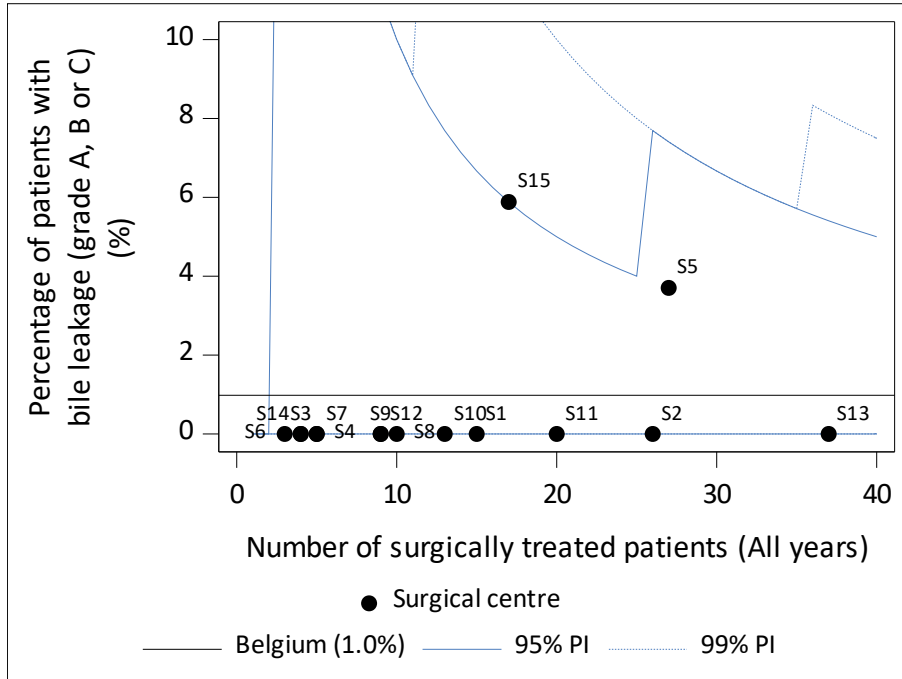


Figure 47: Funnel and spaghetti plot of surgically treated patients with **bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

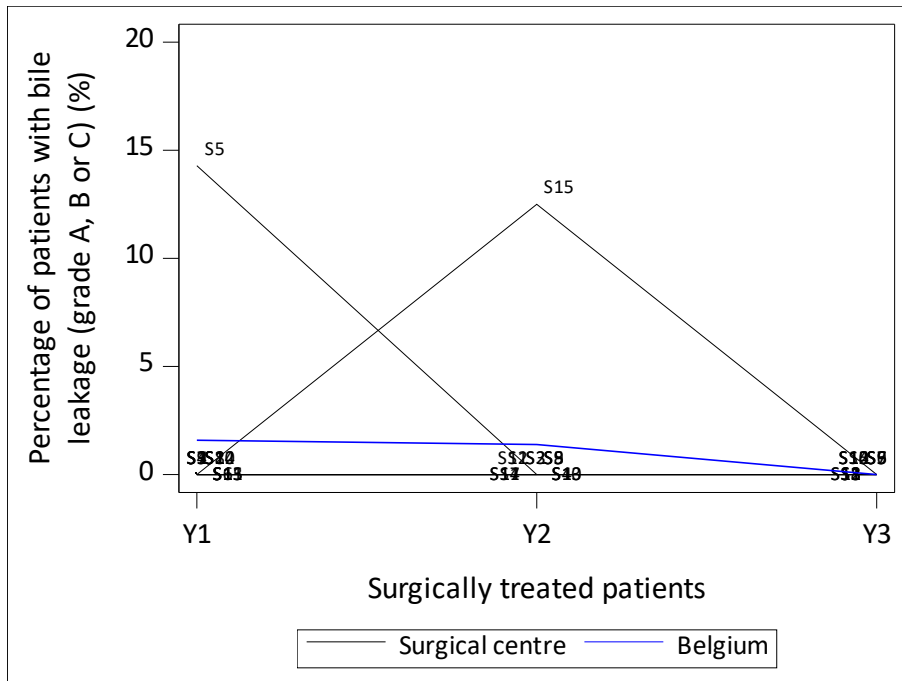
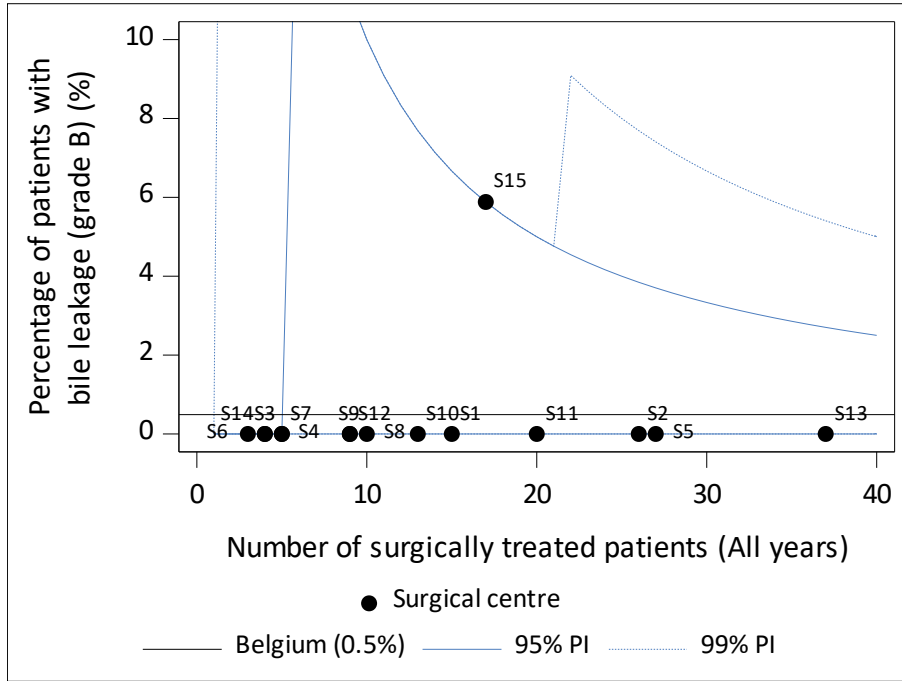


Figure 48: Funnel and spaghetti plot of surgically treated patients with **bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)

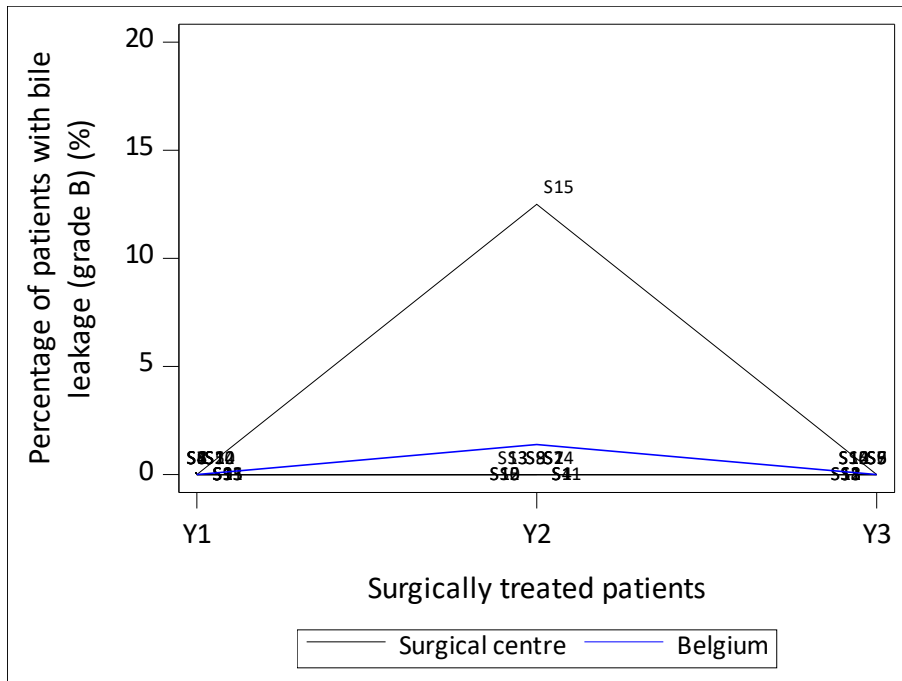
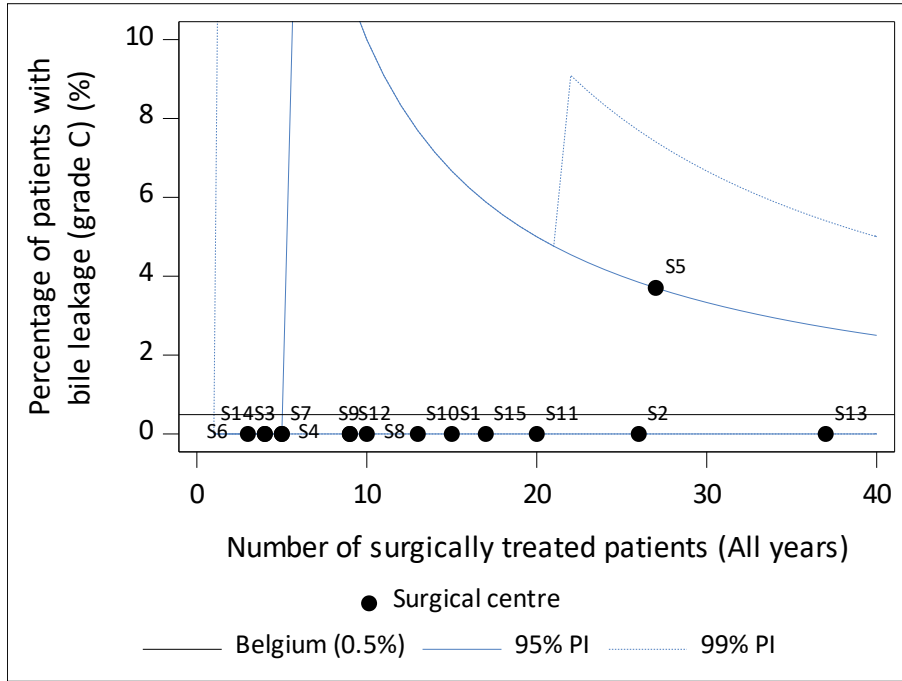
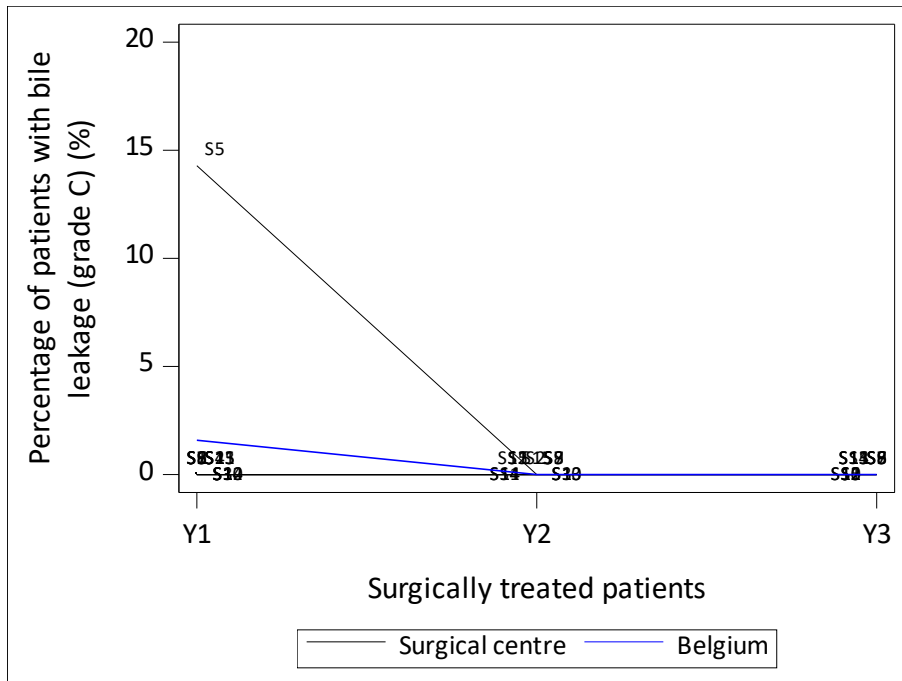


Figure 49: Funnel and spaghetti plot of surgically treated patients with **bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2 and 3.

(a)



(b)



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

Table 30. Proportion of surgically treated patients with severe surgical complications in the three convention years, by patient and tumour characteristics.

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
Overall Year 1 + 2 + 3	204	23	11.3	[7.3, 16.4]
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]
Sex				
Male	139	17	12.2	[7.3, 18.9]
Female	65	6	9.2	[3.5, 19.0]
Age at surgery				
<=69	181	22	12.2	[7.8, 17.8]
70-79	22	1	4.5	[0.1, 22.8]
>=80	1	0	0.0	[0.0, 97.5]
Prior surgery or other treatment **				
Prior abdominal surgery	44	7	15.9	[6.6, 30.1]
Other treatment modality (that could affect the pancreas)	43	5	11.6	[3.9, 25.1]
Charlson Comorbidity Index				
0	83	11	13.3	[6.8, 22.5]
1	48	5	10.4	[3.5, 22.7]
2	30	5	16.7	[5.6, 34.7]
3	21	1	4.8	[0.1, 23.8]
4	12	0	0.0	[0.0, 26.5]
5	3	0	0.0	[0.0, 70.8]
6	4	1	25.0	[0.6, 80.6]
9	1	0	0.0	[0.0, 97.5]
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	47	5	10.6	[3.5, 23.1]
1 - Symptomatic, but ambulant	126	14	11.1	[6.2, 17.9]
2 - Symptomatic, bedbound < 50% day	24	2	8.3	[1.0, 27.0]
3 - Symptomatic, bedbound > 50% day	5	0	0.0	[0.0, 52.2]
4 - Completely dependent, 100% bedbound	2	2	100.0	[15.8, 100.0]

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
ASA score				
1 - Healthy person	12	0	0.0	[0.0, 26.5]
2 - Mild systemic disease, normal activity	108	12	11.1	[5.9, 18.6]
3 - Serious systemic disease, limited activity	79	9	11.4	[5.3, 20.5]
4 - Life-threatening illness, handicapped	5	2	40.0	[5.3, 85.3]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	46	4	8.7	[2.4, 20.8]
Minimally invasive surgery (MIS) - Hybrid	2	0	0.0	[0.0, 84.2]
Minimally invasive surgery (MIS) - Robotic	16	0	0.0	[0.0, 20.6]
Open	131	19	14.5	[9.0, 21.7]
Conversion from MIS to open surgery	9	0	0.0	[0.0, 33.6]
Simultaneous vascular resection				
No vascular reconstruction	198	21	10.6	[6.7, 15.8]
Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection	6	2	33.3	[4.3, 77.7]
Simultaneous other organ resection **				
No	124	13	10.5	[5.7, 17.3]
Colon	8	3	37.5	[8.5, 75.5]
Stomach	23	5	21.7	[7.5, 43.7]
Adrenal gland	6	2	33.3	[4.3, 77.7]
Spleen	52	5	9.6	[3.2, 21.0]
Other	17	4	23.5	[6.8, 49.9]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	115	16	13.9	[8.2, 21.6]
Pancreaticoduodenectomy	104	14	13.5	[7.6, 21.6]
Total Pancreatectomy	11	2	18.2	[2.3, 51.8]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	30	2	6.7	[0.8, 22.1]
242874-242885: Hemipancreatectomy left	58	5	8.6	[2.9, 19.0]
242896-242900: Enucleation of a pancreatic tumour	1	0	0.0	[0.0, 97.5]
Antithrombotic medication				
No	160	20	12.5	[7.8, 18.6]
Yes	44	3	6.8	[1.4, 18.7]
Was the patient referred?				
No	123	16	13.0	[7.6, 20.3]
Yes	81	7	8.6	[3.5, 17.0]

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI

** 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 surgically treated population

5.1. Case mix description for the total surgically treated population

Table 31. Case mix description for **all surgically treated** pathology.

Characteristic	Belgium					
	Year 1		Year 2		Year 3	
	N	%	N	%	N	%
<i>N patients with surgery</i>	787		928		920	
<i>Morphology</i>						
Adenocarcinoma	476	60.5	558	60.1	556	60.4
Neuroendocrine tumour	67	8.5	113	12.2	122	13.3
Benign tumour	126	16.0	135	14.5	112	12.2
Other or unspecified	118	15.0	122	13.1	130	14.1
<i>Type of surgery</i>						
Minimally invasive surgery (MIS) – Laparoscopic	207	26.3	270	29.1	293	31.8
Minimally invasive surgery (MIS) - Hybrid	1	0.1	3	0.3	2	0.2
Minimally invasive surgery (MIS) - Robotic	21	2.7	78	8.4	91	9.9
Open	532	67.6	530	57.1	483	52.5
Conversion from MIS to open surgery	26	3.3	47	5.1	51	5.5
<i>RIZIV code for complex surgery</i>						
242830-242841: Pancreaticoduodenectomy	563	71.5	601	64.8	597	64.9
Pancreaticoduodenectomy	512	90.9	548	91.2	548	91.8
Total Pancreatectomy	51	9.1	53	8.8	49	8.2
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
242874-242885: Hemipancreatectomy left	150	19.1	208	22.4	217	23.6
242896-242900: Enucleation of a pancreatic tumour	11	1.4	15	1.6	18	2.0

5.2. Postoperative mortality for the total surgically treated population

5.2.1. Unadjusted 30-day postoperative mortality

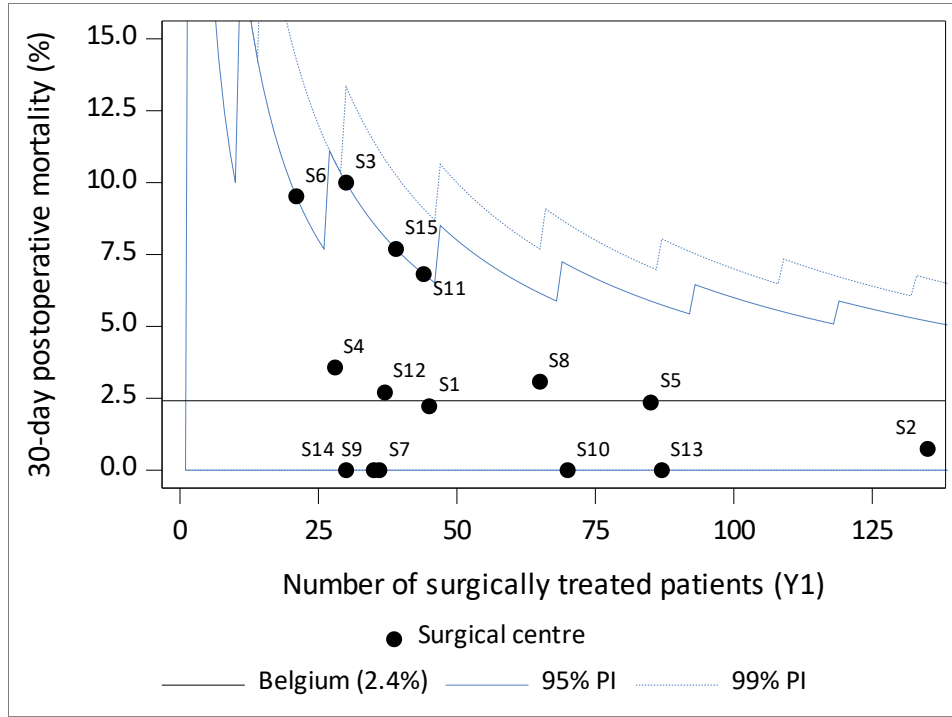
Table 32. Unadjusted 30-day postoperative mortality for **all surgically treated** pathology in the three convention years, by patient and tumour characteristics.

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Overall Y1+Y2+Y3	2,635	61	2.3	[1.8, 3.0]
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]
Sex				
Male	1,439	39	2.7	[1.9, 3.7]
Female	1,196	22	1.8	[1.2, 2.8]
Age at surgery				
<=69	1,574	27	1.7	[1.1, 2.5]
70-79	850	25	2.9	[1.9, 4.3]
>=80	211	9	4.3	[2.0, 7.9]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	2,566	58	2.3	[1.7, 2.9]
Relapse of primary tumour	40	2	5.0	[0.6, 16.9]
Metastasis	29	1	3.4	[0.1, 17.8]
Morphology				
Adenocarcinoma	1,590	50	3.1	[2.3, 4.1]
Neuroendocrine tumour	302	2	0.7	[0.1, 2.4]
Benign tumour	373	4	1.1	[0.3, 2.7]
Other or unspecified	370	5	1.4	[0.4, 3.1]
Charlson Comorbidity Index				
0	1,089	8	0.7	[0.3, 1.4]
1	619	23	3.7	[2.4, 5.5]
2	432	16	3.7	[2.1, 5.9]
3	223	5	2.2	[0.7, 5.2]
4	124	2	1.6	[0.2, 5.7]
5	52	2	3.8	[0.5, 13.2]
6	46	3	6.5	[1.4, 17.9]

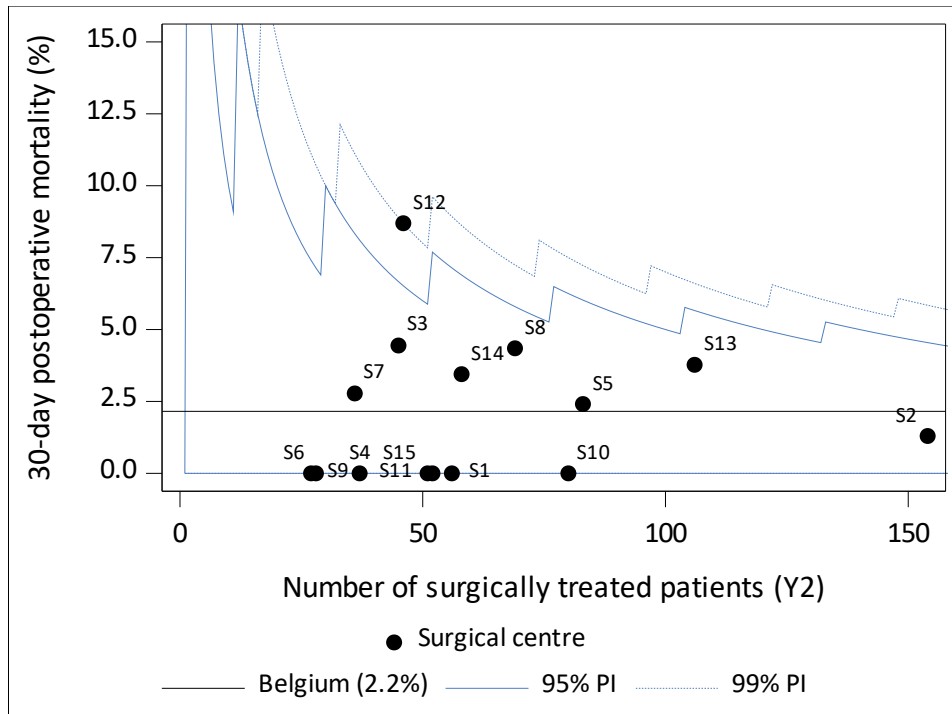
Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
7	21	1	4.8	[0.1, 23.8]
8	12	0	0.0	[0.0, 26.5]
9	9	1	11.1	[0.3, 48.2]
10	5	0	0.0	[0.0, 52.2]
11	2	0	0.0	[0.0, 84.2]
12	1	0	0.0	[0.0, 97.5]
WHO score at surgery				
0 - Asymptomatic, normal activity	791	11	1.4	[0.7, 2.5]
1 - Symptomatic, but ambulant	1,547	37	2.4	[1.7, 3.3]
2 - Symptomatic, bedbound < 50% day	250	10	4.0	[1.9, 7.2]
3 - Symptomatic, bedbound > 50% day	43	2	4.7	[0.6, 15.8]
4 - Completely dependent, 100% bedbound	4	1	25.0	[0.6, 80.6]
ASA score				
1 - Healthy person	213	2	0.9	[0.1, 3.4]
2 - Mild systemic disease, normal activity	1,424	25	1.8	[1.1, 2.6]
3 - Serious systemic disease, limited activity	966	31	3.2	[2.2, 4.5]
4 - Life-threatening illness, handicapped	32	3	9.4	[2.0, 25.0]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	770	9	1.2	[0.5, 2.2]
Minimally invasive surgery (MIS) - Hybrid	6	0	0.0	[0.0, 45.9]
Minimally invasive surgery (MIS) - Robotic	190	2	1.1	[0.1, 3.8]
Open	1,545	41	2.7	[1.9, 3.6]
Conversion from MIS to open surgery	124	9	7.3	[3.4, 13.3]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	1,761	53	3.0	[2.3, 3.9]
Pancreaticoduodenectomy	1,608	47	2.9	[2.2, 3.9]
Total Pancreatectomy	153	6	3.9	[1.5, 8.3]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	255	4	1.6	[0.4, 4.0]
242874-242885: Hemipancreatectomy left	575	3	0.5	[0.1, 1.5]
242896-242900: Enucleation of a pancreatic tumour	44	1	2.3	[0.1, 12.0]
Antithrombotic medication				
No	1,877	30	1.6	[1.1, 2.3]
Yes	758	31	4.1	[2.8, 5.8]
Was the patient referred?				
No	1,221	30	2.5	[1.7, 3.5]
Yes	1,414	31	2.2	[1.5, 3.1]

Figure 51: Funnel and spaghetti plot of the unadjusted 30-day postoperative mortality for **all surgically treated** pathology, in the three convention years, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

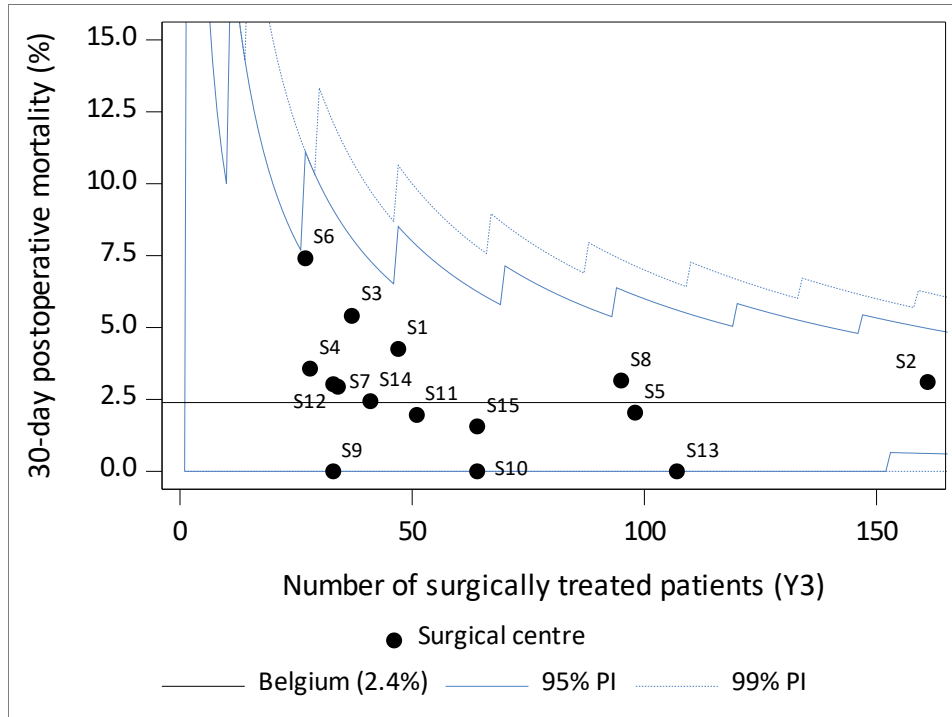
(a)



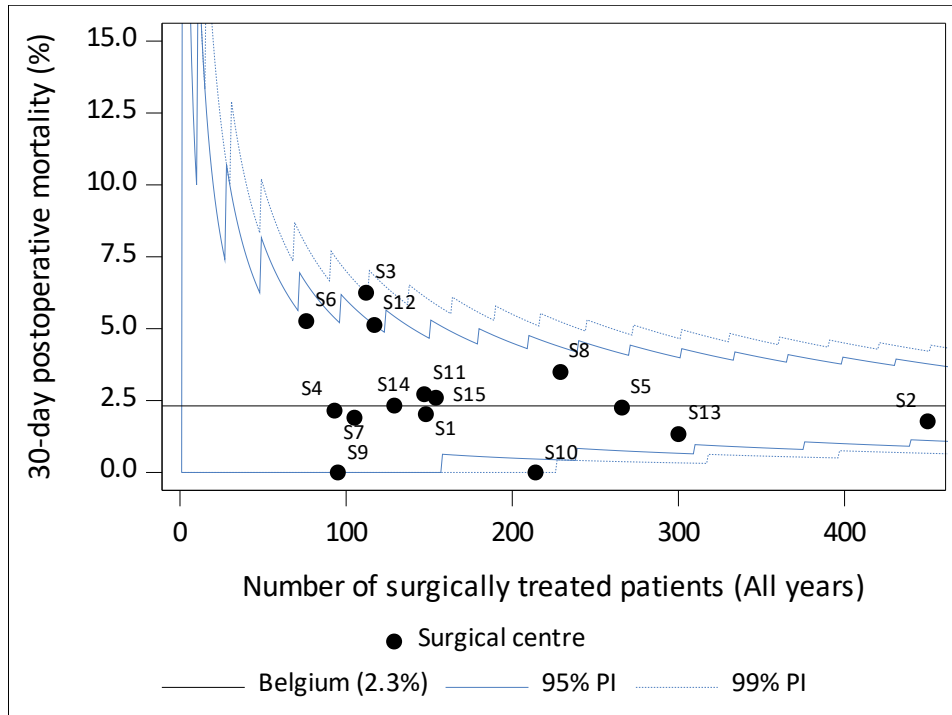
(b)



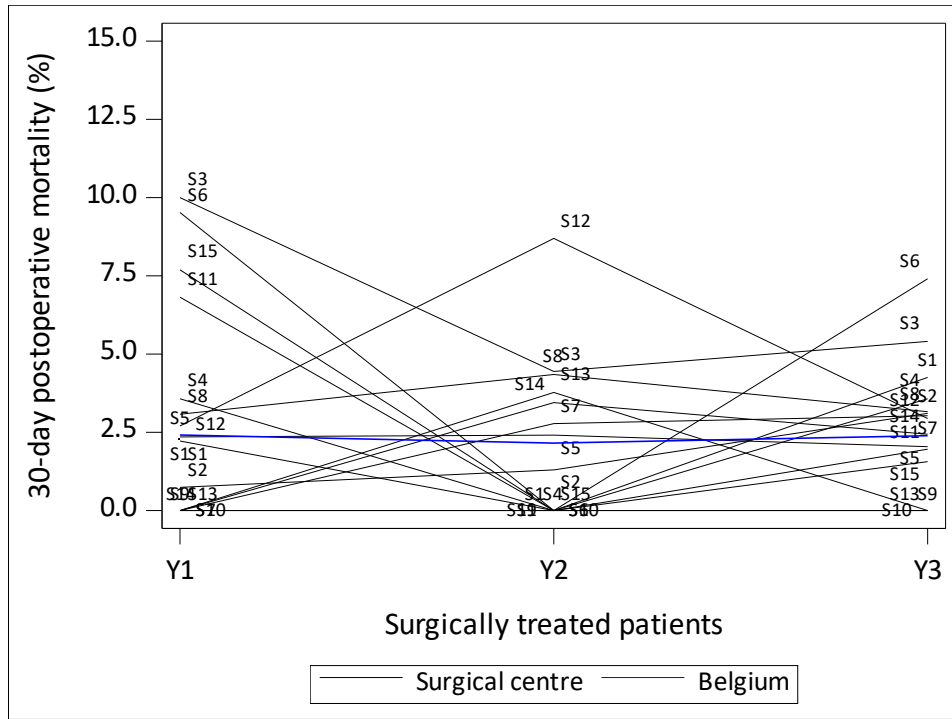
(c)



(d)



(e)



5.2.1. Unadjusted 90-day postoperative mortality

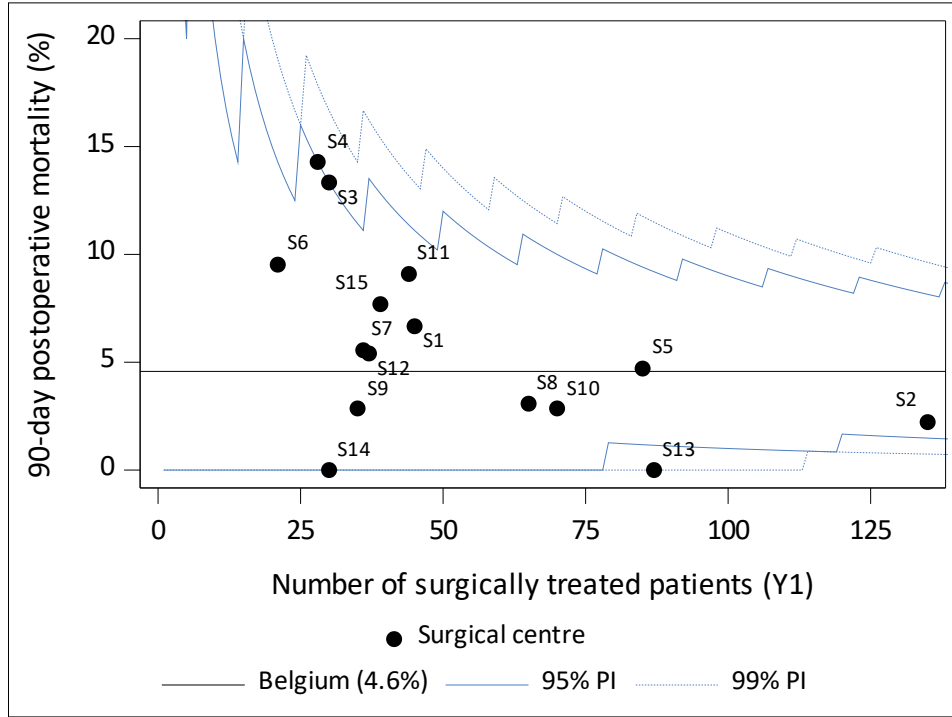
Table 33. Unadjusted 90-day postoperative mortality for **all surgically treated** pathology in the three convention years, by patient and tumour characteristics.

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Overall Y1+Y2+Y3	2,635	130	4.9	[4.1, 5.8]
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]
Sex				
Male	1,439	74	5.1	[4.1, 6.4]
Female	1,196	56	4.7	[3.6, 6.0]
Age at surgery				
<=69	1,574	52	3.3	[2.5, 4.3]
70-79	850	57	6.7	[5.1, 8.6]
>=80	211	21	10.0	[6.3, 14.8]
Lesion to treat (in (peri-)pancreas)				
Primary tumour	2,566	123	4.8	[4.0, 5.7]
Relapse of primary tumour	40	4	10.0	[2.8, 23.7]
Metastasis	29	3	10.3	[2.2, 27.4]
Morphology				
Adenocarcinoma	1,590	107	6.7	[5.5, 8.1]
Neuroendocrine tumour	302	7	2.3	[0.9, 4.7]
Benign tumour	373	6	1.6	[0.6, 3.5]
Other or unspecified	370	10	2.7	[1.3, 4.9]
Charlson Comorbidity Index				
0	1,089	26	2.4	[1.6, 3.5]
1	619	39	6.3	[4.5, 8.5]
2	432	26	6.0	[4.0, 8.7]
3	223	10	4.5	[2.2, 8.1]
4	124	9	7.3	[3.4, 13.3]
5	52	8	15.4	[6.9, 28.1]
6	46	5	10.9	[3.6, 23.6]
7	21	3	14.3	[3.0, 36.3]
8	12	1	8.3	[0.2, 38.5]
9	9	1	11.1	[0.3, 48.2]

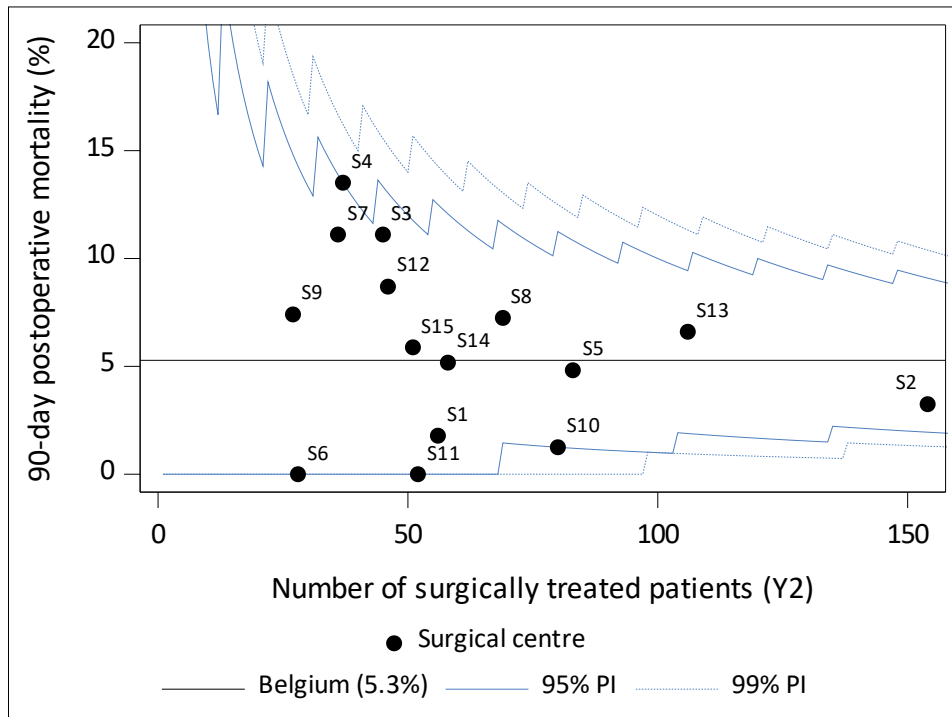
Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
10	5	2	40.0	[5.3, 85.3]
11	2	0	0.0	[0.0, 84.2]
12	1	0	0.0	[0.0, 97.5]
WHO score at surgery				
0 - Asymptomatic, normal activity	791	22	2.8	[1.8, 4.2]
1 - Symptomatic, but ambulant	1,547	75	4.8	[3.8, 6.0]
2 - Symptomatic, bedbound < 50% day	250	26	10.4	[6.9, 14.9]
3 - Symptomatic, bedbound > 50% day	43	5	11.6	[3.9, 25.1]
4 - Completely dependent, 100% bedbound	4	2	50.0	[6.8, 93.2]
ASA score				
1 - Healthy person	213	4	1.9	[0.5, 4.7]
2 - Mild systemic disease, normal activity	1,424	57	4.0	[3.0, 5.2]
3 - Serious systemic disease, limited activity	966	64	6.6	[5.1, 8.4]
4 - Life-threatening illness, handicapped	32	5	15.6	[5.3, 32.8]
Type of surgery				
Minimally invasive surgery (MIS) – Laparoscopic	770	21	2.7	[1.7, 4.1]
Minimally invasive surgery (MIS) - Hybrid	6	1	16.7	[0.4, 64.1]
Minimally invasive surgery (MIS) - Robotic	190	5	2.6	[0.9, 6.0]
Open	1,545	91	5.9	[4.8, 7.2]
Conversion from MIS to open surgery	124	12	9.7	[5.1, 16.3]
RIZIV code for complex surgery				
242830-242841: Pancreaticoduodenectomy	1,761	108	6.1	[5.1, 7.4]
Pancreaticoduodenectomy	1,608	95	5.9	[4.8, 7.2]
Total Pancreatectomy	153	13	8.5	[4.6, 14.1]
242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct)	255	8	3.1	[1.4, 6.1]
242874-242885: Hemipancreatectomy left	575	13	2.3	[1.2, 3.8]
242896-242900: Enucleation of a pancreatic tumour	44	1	2.3	[0.1, 12.0]
Antithrombotic medication				
No	1,877	75	4.0	[3.2, 5.0]
Yes	758	55	7.3	[5.5, 9.3]
Was the patient referred?				
No	1,221	59	4.8	[3.7, 6.2]
Yes	1,414	71	5.0	[3.9, 6.3]

Figure 52: Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality for **all surgically treated** pathology, in the three convention years, per centre, for (a) year 1, (b) year 2, (c) year 3, (d) all years combined, (e) evolution year 1, 2 and 3.

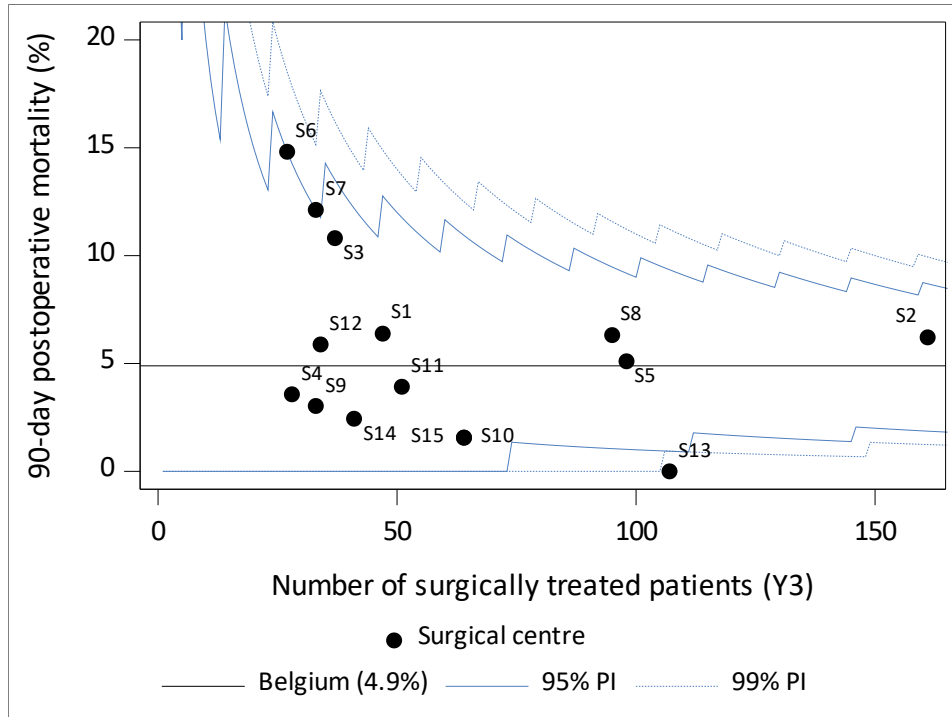
(a)



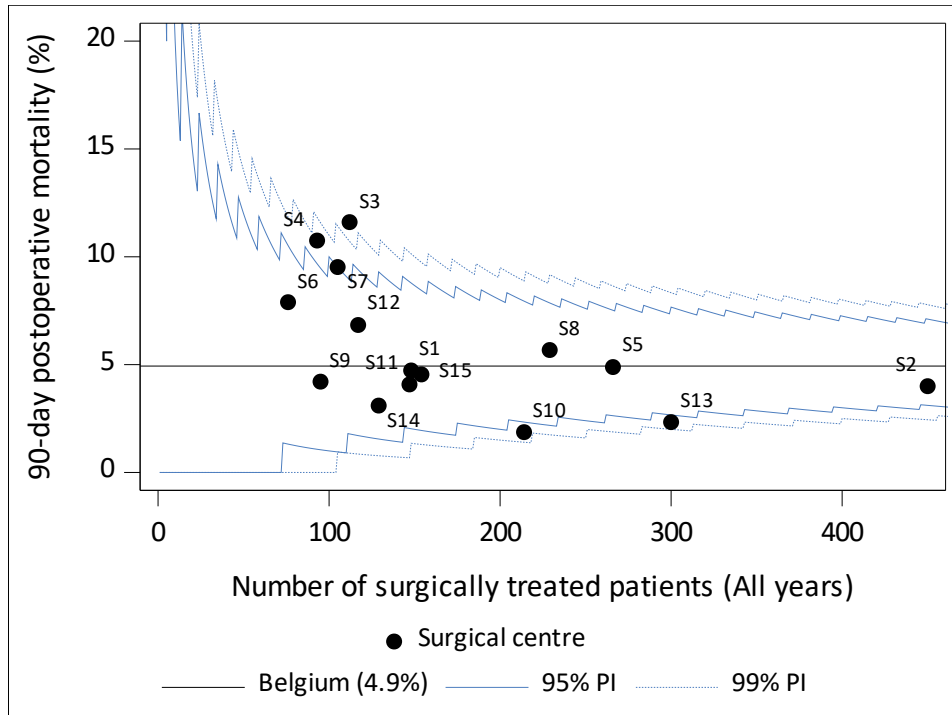
(b)



(c)



(d)



(e)

