

Belgian Cancer Registry



RIZIV/INAMI convention Complex Surgery

Oesophagus and Gastro-Oesophageal Junction

Global report

July 2019 - June 2024

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 five years of the RIZIV/INAMI convention regarding the reimbursement of complex surgery for tumours of the oesophagus or gastro-oesophageal junction (GOJ) and non-oncological conditions of the oesophagus. 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 pathology. For the latter two indication categories, which are presented together as "non-malignant pathology", not all indicators are calculated. For the malignant tumours, the resections were categorized as 'standard surgery' or 'non-standard surgery'. Resections carried out in emergency setting, resections with palliative intention, resections concerning a tumour recurrence and total laryngo-oesophagectomies were regarded as 'non-standard surgery', all the other resections were considered 'standard surgery'.

For details on the calculation of the indicators, see document 'Complex Surgery - Oesophagus Reading guide v2.0 (14/02/2020)'.

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 - 30/06/2024.
- In case of no surgery: date of MC 1/07/2019 - 30/06/2024.

Remarks:

- Foreign patients were not included in the data selection criteria.
- In case that the same patient was registered by two different hospitals, the registration was assigned to the centre where the surgery was performed.
 - In case that the same patient was registered by two different hospitals without any surgery, the registration was assigned to the centre where the first MC took place.
 - Registrations sent by collaborating hospitals were counted among those of the main expert centre within their collaboration.
 - Hospitals S5 and S7 are not shown in the figures because they are no longer part of the convention. S5 is no longer participating since 1/10/2022 and S7 is no longer participating since 17/2/2023. However, the results for all hospitals (including S5 and S7) are used to calculate the overall and reference results (BE), provided in the figures and in the tables.

2. General overview of registered patients

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

Patient group	Belgium									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
Patients discussed on a MC expert	1,038	–	965	–	1,009	–	934	–	1,012	–
Patients with surgery	448	43.2^a	437	45.3^a	453	44.9^a	409	43.8^a	401	39.6^a
Malignant tumour	418	93.3 ^b	404	92.4 ^b	420	92.7 ^b	387	94.6 ^b	371	92.5 ^b
Standard surgery	395	94.5 ^c	380	94.1 ^c	408	97.1 ^c	369	95.3 ^c	356	96.0 ^c
Non-standard surgery	23	5.5 ^c	24	5.9 ^c	12	2.9 ^c	18	4.7 ^c	15	4.0 ^c
Non-malignant pathology	30	6.7 ^b	33	7.6 ^b	33	7.3 ^b	22	5.4 ^b	30	7.5 ^b
Expert centres										
S1	23	5.1 ^b	32	7.3 ^b	46	10.2 ^b	59	14.4 ^b	52	13.0 ^b
S2	155	34.6 ^b	129	29.5 ^b	118	26.0 ^b	112	27.4 ^b	119	29.7 ^b
S3	35	7.8 ^b	40	9.2 ^b	33	7.3 ^b	31	7.6 ^b	33	8.2 ^b
S4	56	12.5 ^b	39	8.9 ^b	43	9.5 ^b	43	10.5 ^b	41	10.2 ^b
S5	14	3.1 ^b	20	4.6 ^b	27	6.0 ^b	5	1.2 ^b		
S6	33	7.4 ^b	28	6.4 ^b	40	8.8 ^b	36	8.8 ^b	45	11.2 ^b
S7	14	3.1 ^b	26	5.9 ^b	29	6.4 ^b	4	1.0 ^b		
S8	25	5.6 ^b	27	6.2 ^b	24	5.3 ^b	26	6.4 ^b	29	7.2 ^b
S9	19	4.2 ^b	21	4.8 ^b	23	5.1 ^b	25	6.1 ^b	27	6.7 ^b
S10	74	16.5 ^b	75	17.2 ^b	70	15.5 ^b	68	16.6 ^b	55	13.7 ^b
Patients without surgery	590	56.8^a	528	54.7^a	556	55.1^a	525	56.2^a	611	60.4^a
Malignant tumour	561	95.1 ^b	512	97.0 ^b	538	96.8 ^b	503	95.8 ^b	587	96.1 ^b
Non-malignant pathology	29	4.9 ^b	16	3.0 ^b	18	3.2 ^b	22	4.2 ^b	24	3.9 ^b
Expert centres										
S1	31	5.3 ^b	38	7.2 ^b	29	5.2 ^b	36	6.9 ^b	36	5.9 ^b
S2	149	25.3 ^b	127	24.1 ^b	112	20.1 ^b	128	24.4 ^b	158	25.9 ^b
S3	32	5.4 ^b	35	6.6 ^b	33	5.9 ^b	30	5.7 ^b	23	3.8 ^b
S4	76	12.9 ^b	72	13.6 ^b	67	12.1 ^b	66	12.6 ^b	96	15.7 ^b
S5	50	8.5 ^b	36	6.8 ^b	49	8.8 ^b	6	1.1 ^b		
S6	33	5.6 ^b	49	9.3 ^b	54	9.7 ^b	54	10.3 ^b	42	6.9 ^b
S7	23	3.9 ^b	26	4.9 ^b	21	3.8 ^b	3	0.6 ^b		
S8	77	13.1 ^b	42	8.0 ^b	77	13.8 ^b	70	13.3 ^b	92	15.1 ^b
S9	31	5.3 ^b	31	5.9 ^b	60	10.8 ^b	55	10.5 ^b	61	10.0 ^b
S10	88	14.9 ^b	72	13.6 ^b	54	9.7 ^b	77	14.7 ^b	103	16.9 ^b

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

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

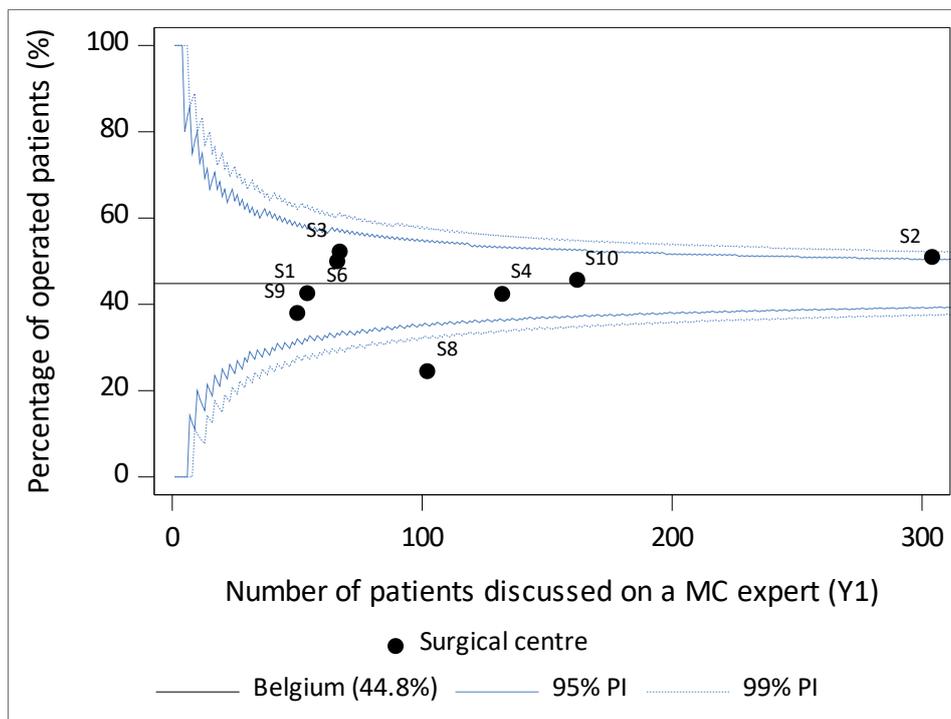
^c percentage relative to the number of malignant tumours

Non-standard surgery = emergency, palliative, recurrence, total laryngectomy

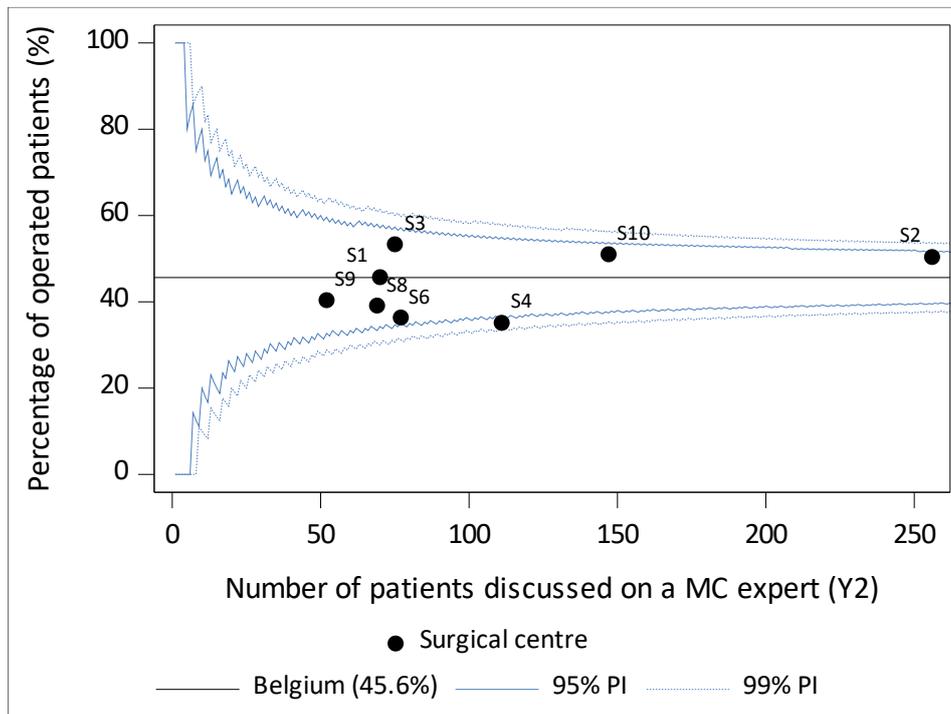
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result per year (BE).

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

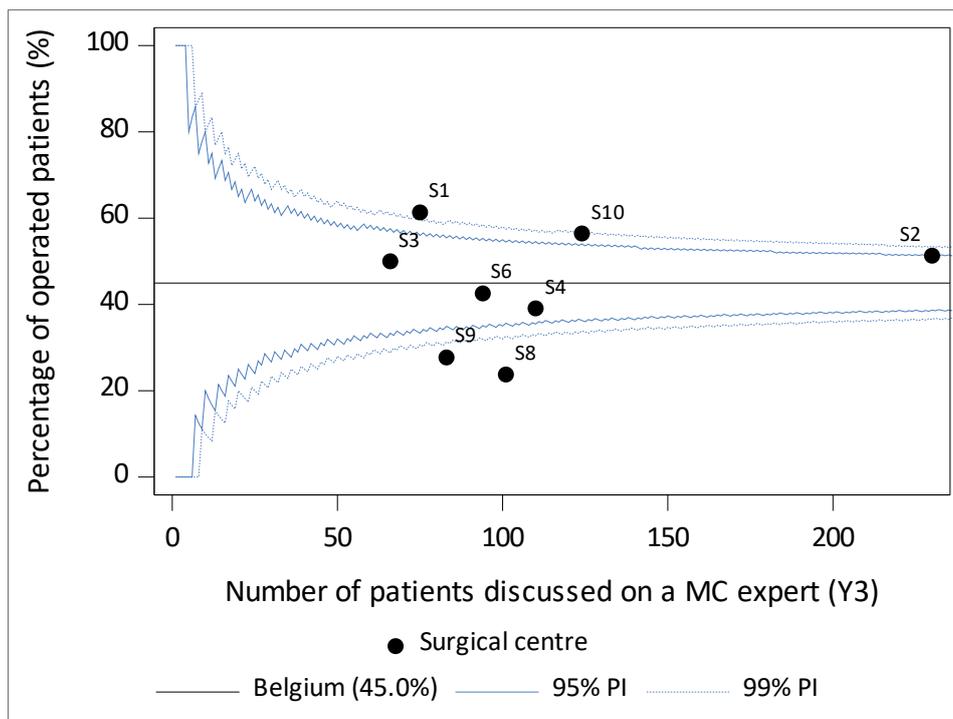
(a)



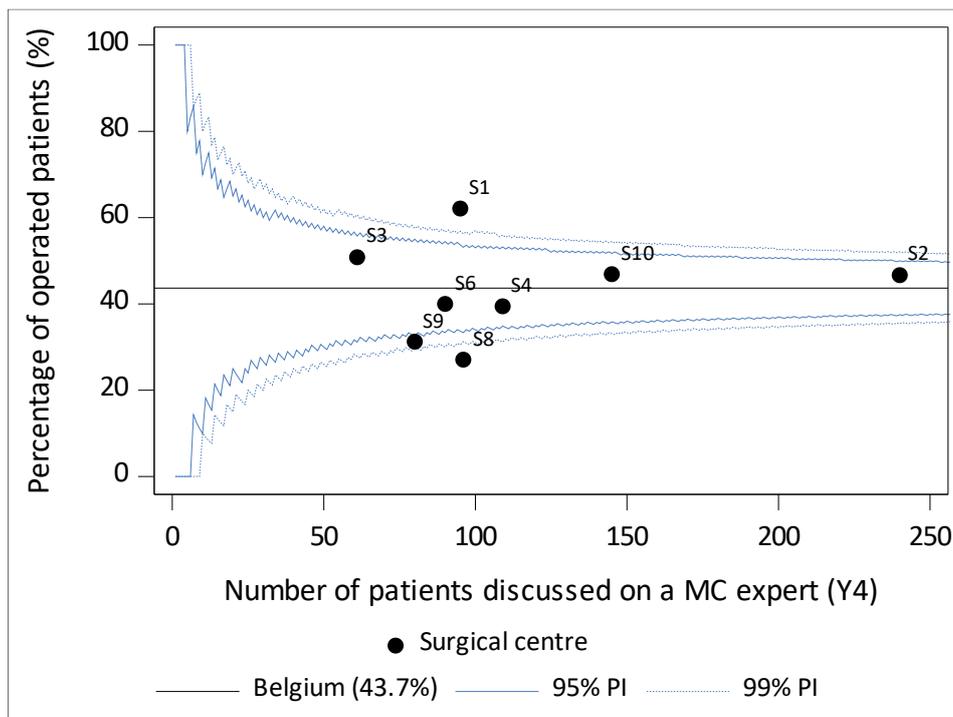
(b)



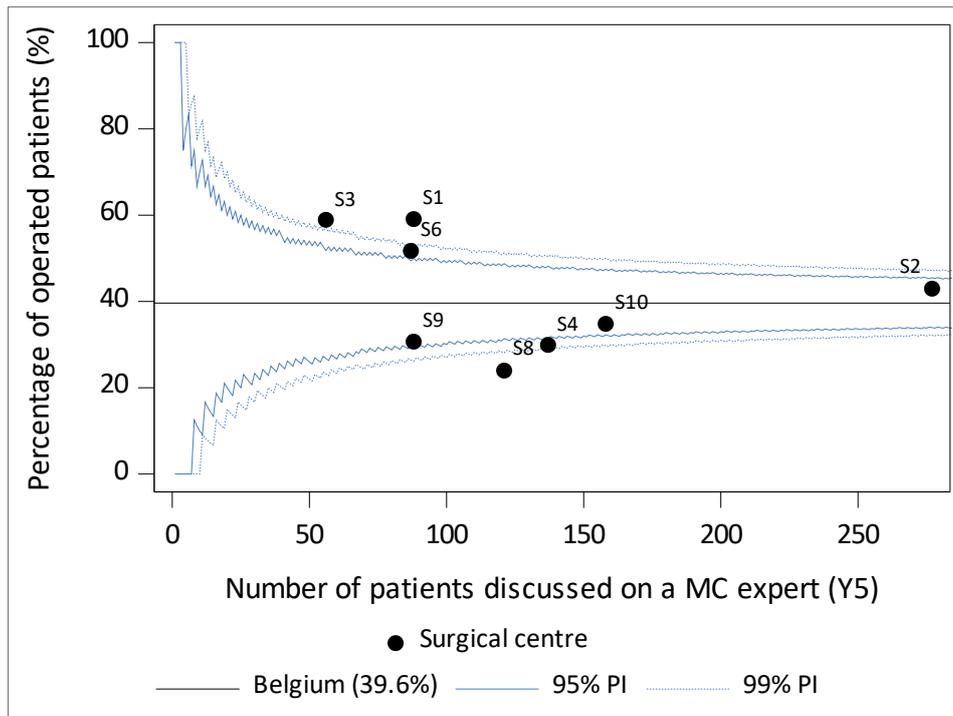
(c)



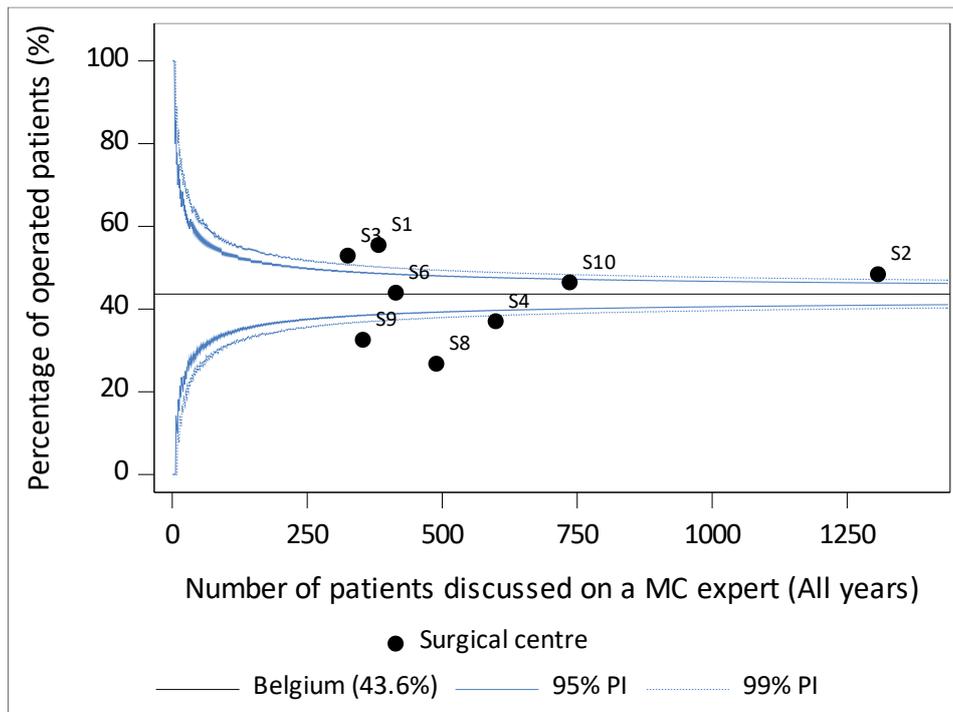
(d)



(e)



(f)



(g)

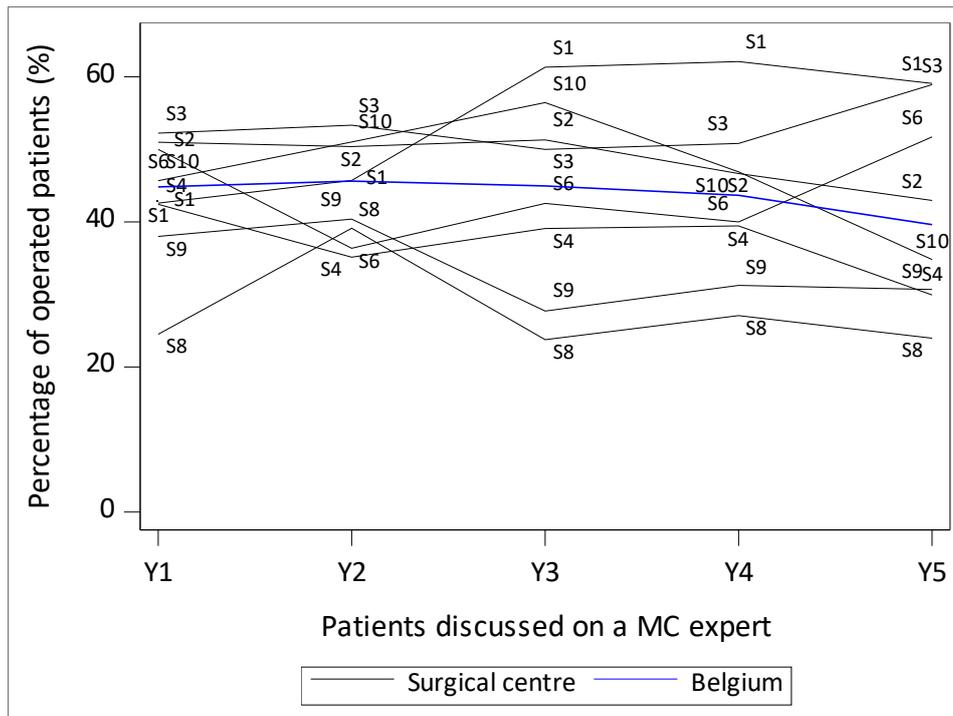
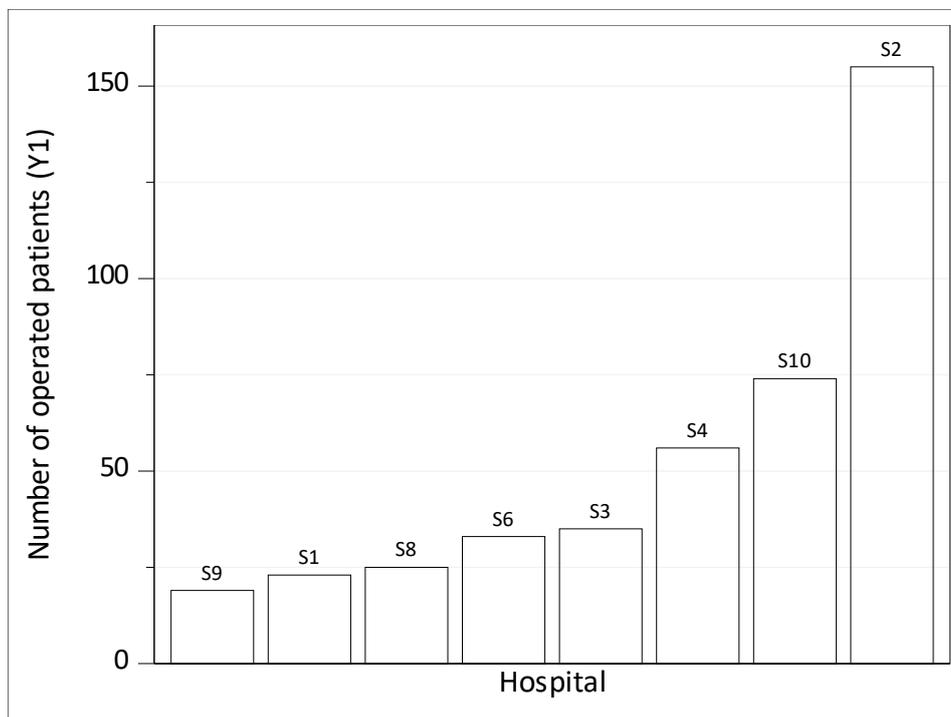
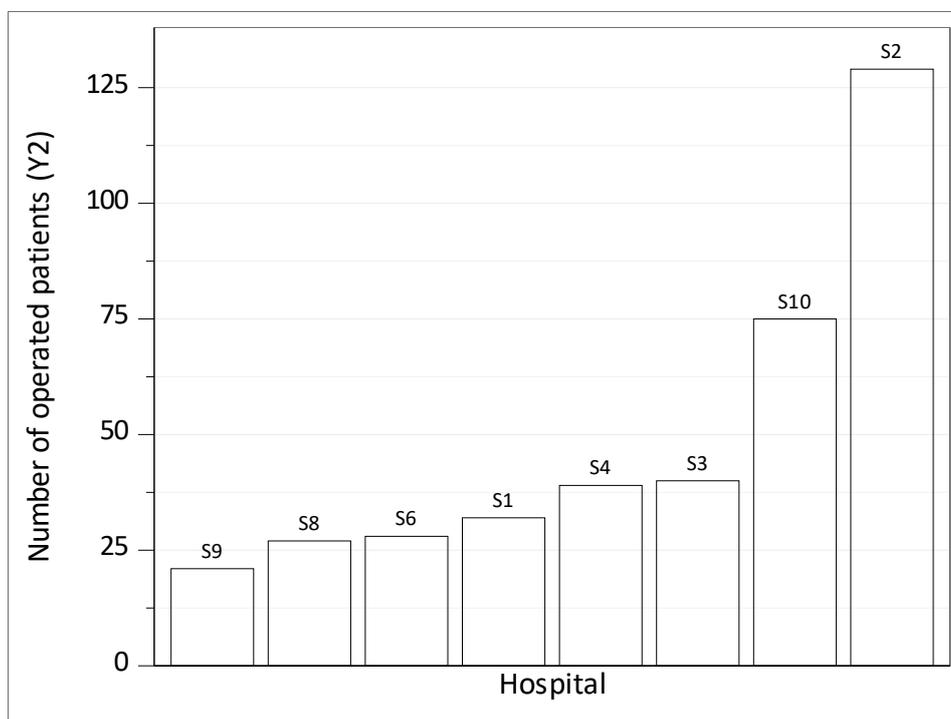


Figure 2: Absolute number of patients discussed on a MC expert that were treated with surgery, by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 and (f) all years combined.

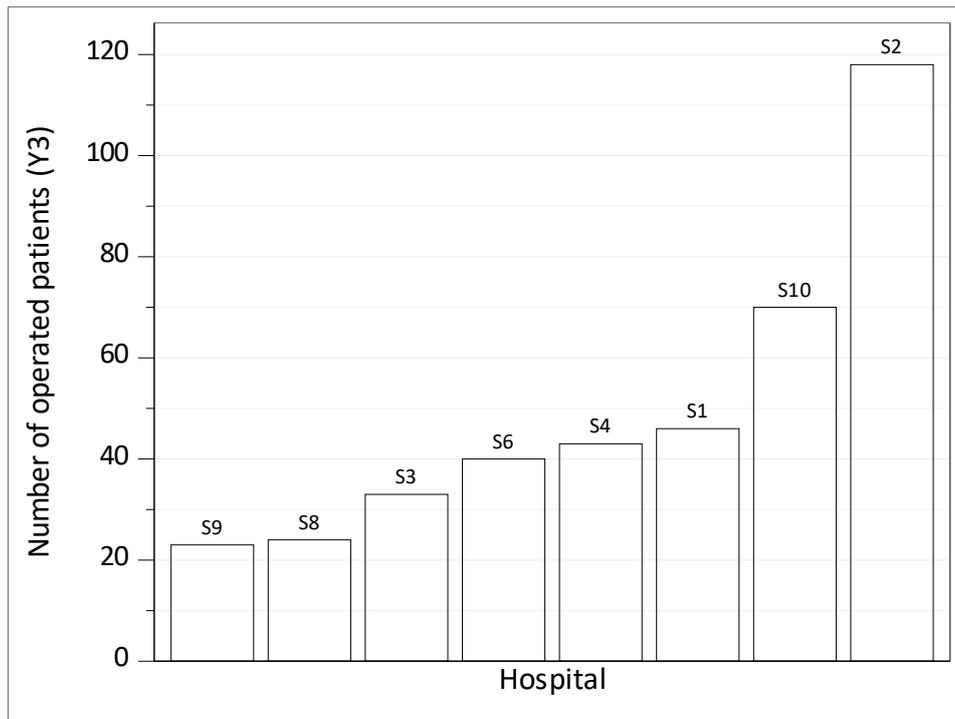
(a)



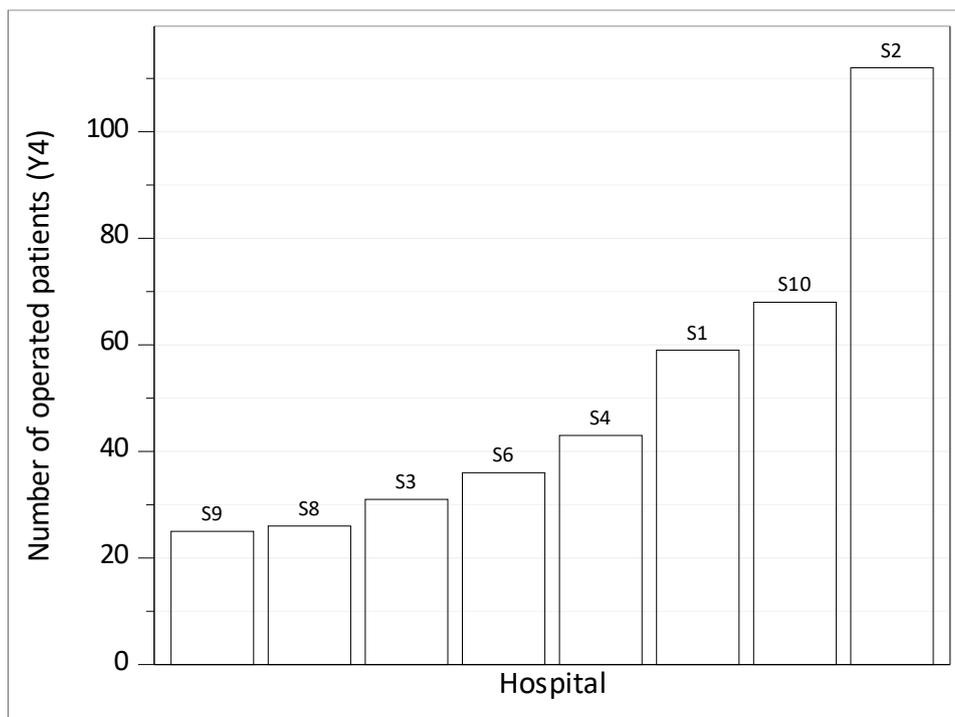
(b)



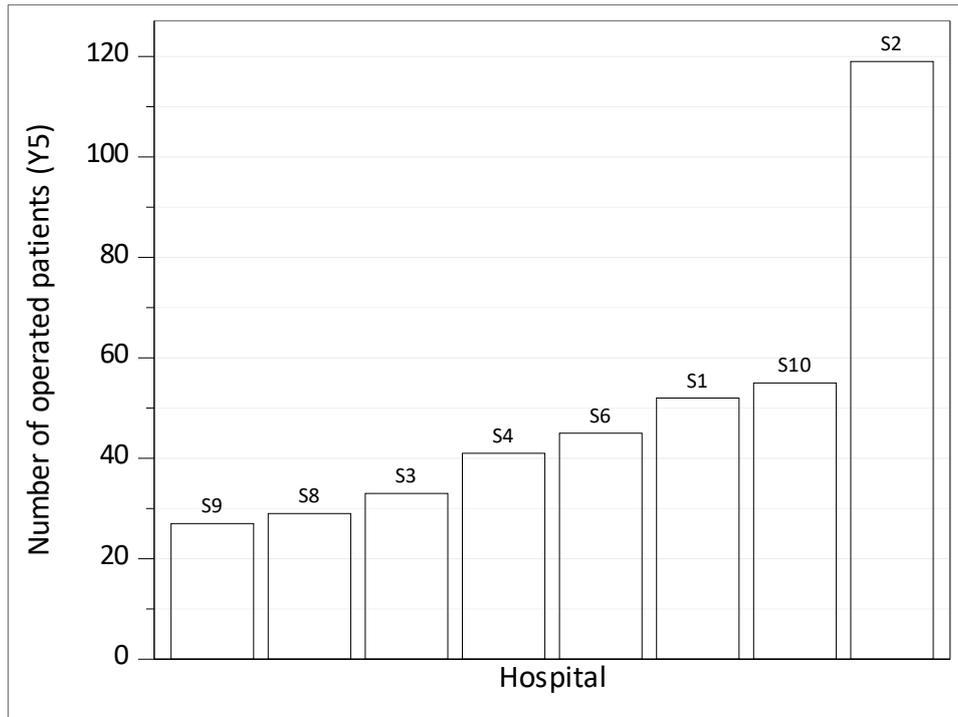
(c)



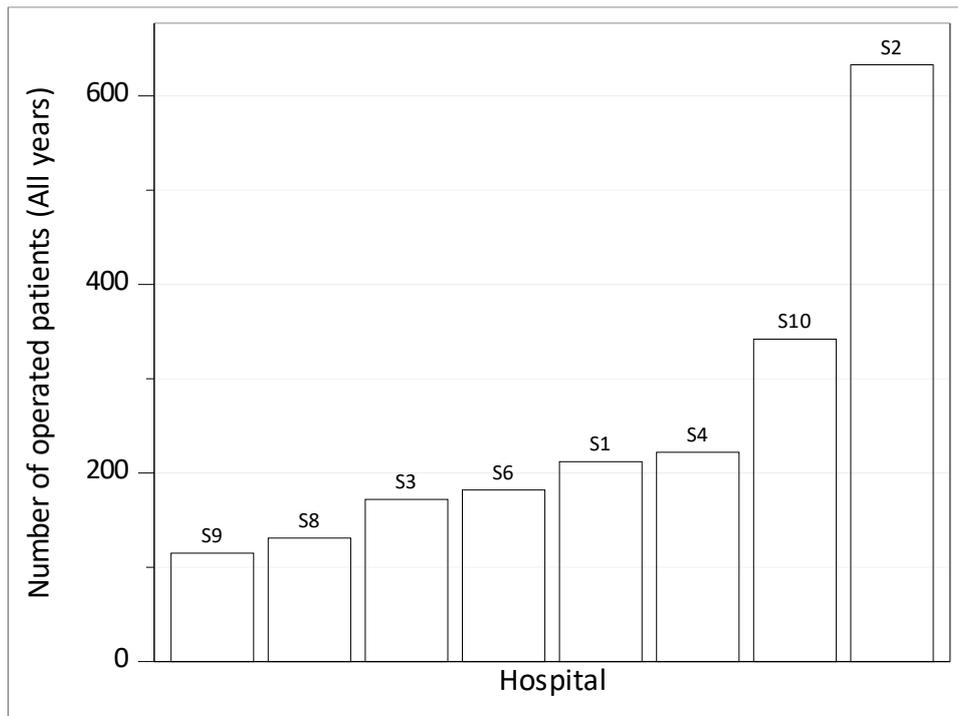
(d)



(e)



(f)



3. Malignant tumours

3.1. Descriptives

3.1.1. Patient case mix description

Table 2: Case mix description of all patients discussed on a MC expert who underwent surgical treatment (only for standard surgery).

Characteristic	Belgium (N=1,908)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
Patients with standard surgery	395		380		408		369		356	
Expert centres										
S1	21	5.3	28	7.4	43	10.5	55	14.9	47	13.2
S2	131	33.2	110	28.9	112	27.5	101	27.4	104	29.2
S3	32	8.1	39	10.3	33	8.1	29	7.9	29	8.1
S4	52	13.2	35	9.2	34	8.3	36	9.8	37	10.4
S5	14	3.5	20	5.3	25	6.1	5	1.4	0	0.0
S6	26	6.6	23	6.1	36	8.8	35	9.5	41	11.5
S7	13	3.3	20	5.3	23	5.6	4	1.1	0	0.0
S8	24	6.1	27	7.1	20	4.9	20	5.4	27	7.6
S9	17	4.3	16	4.2	17	4.2	22	6.0	24	6.7
S10	65	16.5	62	16.3	65	15.9	62	16.8	47	13.2
Sex										
Male	311	78.7	312	82.1	321	78.7	277	75.1	294	82.6
Female	84	21.3	68	17.9	87	21.3	92	24.9	62	17.4
Age at surgery										
<=69	260	65.8	247	65.0	245	60.0	202	54.7	210	59.0
70-79	117	29.6	113	29.7	144	35.3	136	36.9	125	35.1
>=80	18	4.6	20	5.3	19	4.7	31	8.4	21	5.9
Lesion to treat (in oesophagus/GOJ)										
Primary tumour	386	97.7	372	97.9	396	97.1	362	98.1	347	97.5
Relapse of primary tumour	9	2.3	6	1.6	10	2.5	7	1.9	9	2.5
Metastasis	0	0.0	2	0.5	2	0.5	0	0.0	0	0.0
Morphology										
Adenocarcinoma	301	76.2	273	71.8	308	75.5	273	74.0	274	77.0
Squamous cell carcinoma	89	22.5	100	26.3	93	22.8	88	23.8	74	20.8
Other, unspecified or missing	5	1.3	7	1.8	7	1.7	8	2.2	8	2.2
Primary tumour localisation										
C15.0/C15.3 Cervical/upper third oesophagus	13	3.3	5	1.3	10	2.5	13	3.5	8	2.2
C15.1/C15.4 Thoracic/middle third oesophagus	49	12.4	55	14.5	49	12.0	51	13.8	42	11.8

Characteristic	Belgium (N=1,908)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
C15.2/C15.5 Abdominal/lower third oesophagus	213	53.9	190	50.0	198	48.5	162	43.9	156	43.8
C15.8 Overlapping lesion of oesophagus	0	0.0	0	0.0	4	1.0	4	1.1	3	0.8
C15.9 Oesophagus, NOS	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3
C16.0 Gastro-oesophageal junction	120	30.4	129	33.9	146	35.8	137	37.1	145	40.7
Other	0	0.0	1	0.3	1	0.2	2	0.5	1	0.3
Clinical stage										
0	4	1.1	1	0.3	3	0.8	4	1.1	4	1.2
I	46	12.1	35	9.7	34	8.8	30	8.6	24	7.1
II	63	16.6	68	18.9	75	19.3	76	21.7	71	21.0
III	185	48.8	189	52.5	192	49.5	186	53.1	183	54.1
IV	78	20.6	64	17.8	83	21.4	53	15.1	55	16.3
IVA [#]	62	79.5	52	82.5	71	86.6	43	81.1	38	71.7
IVB [#]	16	20.5	11	17.5	11	13.4	10	18.9	15	28.3
X	3	0.8	3	0.8	1	0.3	1	0.3	1	0.3
TNM not applicable or relapse*	16	—	20	—	20	—	19	—	18	—
Pathological stage										
0	6	7.1	4	5.1	2	2.4	3	4.1	2	3.4
I	39	45.9	42	53.2	33	39.3	30	41.1	23	39.7
II	20	23.5	17	21.5	21	25.0	26	35.6	14	24.1
III	15	17.6	9	11.4	24	28.6	12	16.4	14	24.1
IV	2	2.4	7	8.9	4	4.8	2	2.7	5	8.6
X	3	3.5	0	0.0	0	0.0	0	0.0	0	0.0
TNM not applicable or relapse*	5	—	6	—	6	—	6	—	6	—
Neoadjuvant treatment**	305	—	295	—	318	—	290	—	292	—
yPathological stage										
0	52	17.7	44	15.6	41	13.5	57	20.6	66	23.7
I	31	10.6	27	9.6	40	13.2	38	13.7	36	12.9
II	82	28.0	82	29.1	102	33.6	79	28.5	81	29.0
III	99	33.8	87	30.9	82	27.0	76	27.4	67	24.0
IV	27	9.2	38	13.5	35	11.5	26	9.4	28	10.0
X	2	0.7	4	1.4	4	1.3	1	0.4	1	0.4
TNM not applicable or relapse*	12	—	13	—	14	—	13	—	13	—
No neoadjuvant treatment**	90	—	85	—	90	—	79	—	64	—
Prior surgery or endoscopic treatment***										
Prior major thoracic or abdominal surgery	26	6.6	38	10.0	28	6.9	27	7.3	42	11.8
Endoscopic treatment	21	5.3	24	6.3	19	4.7	19	5.1	19	5.3
EMR/ESD	21	100.0	24	100.0	19	100.0	19	100.0	19	100.0
RFA	2	9.5	0	0.0	0	0.0	1	5.3	1	5.3
Ablation techniques other than RFA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other treatment modality (that could affect the oesophagus)	5	1.3	5	1.3	8	2.0	6	1.6	7	2.0

Characteristic	Belgium (N=1,908)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
Neoadjuvant treatment										
Chemotherapy	93	23.5	114	30.0	107	26.2	100	27.1	107	30.1
Targeted therapy/biologicals	1	0.3	6	1.6	4	1.0	3	0.8	7	2.0
Radiotherapy	0	0.0	1	0.3	0	0.0	0	0.0	0	0.0
Chemoradiotherapy	212	53.7	180	47.4	211	51.7	189	51.2	185	52.0
No chemo, radiation or targeted treatment	90	22.8	85	22.4	90	22.1	79	21.4	64	18.0
Charlson Comorbidity Index										
0	180	45.6	156	41.1	170	41.7	149	40.4	141	39.6
1	101	25.6	114	30.0	104	25.5	83	22.5	103	28.9
2	65	16.5	58	15.3	65	15.9	65	17.6	55	15.4
3	29	7.3	26	6.8	39	9.6	40	10.8	32	9.0
4	11	2.8	12	3.2	21	5.1	18	4.9	6	1.7
5	7	1.8	3	0.8	3	0.7	7	1.9	6	1.7
6	1	0.3	6	1.6	1	0.2	4	1.1	5	1.4
7	1	0.3	3	0.8	3	0.7	1	0.3	6	1.7
8	0	0.0	1	0.3	1	0.2	1	0.3	2	0.6
9	0	0.0	1	0.3	1	0.2	1	0.3	0	0.0
WHO score at surgery										
0 - Asymptomatic, normal activity	121	30.6	86	22.6	97	23.8	90	24.4	116	32.6
1 - Symptomatic, but ambulant	221	55.9	240	63.2	263	64.5	224	60.7	194	54.5
2 - Symptomatic, bedbound < 50% day	50	12.7	40	10.5	42	10.3	40	10.8	37	10.4
3 - Symptomatic, bedbound > 50% day	2	0.5	13	3.4	5	1.2	13	3.5	9	2.5
4 - Completely dependent, 100% bedbound	1	0.3	1	0.3	1	0.2	2	0.5	0	0.0
ASA score										
1 - Healthy person	21	5.3	11	2.9	22	5.4	7	1.9	3	0.8
2 - Mild systemic disease, normal activity	211	53.4	165	43.4	156	38.2	142	38.5	125	35.1
3 - Serious systemic disease, limited activity	160	40.5	202	53.2	221	54.2	216	58.5	222	62.4
4 - Life-threatening illness, handicapped	3	0.8	2	0.5	9	2.2	4	1.1	6	1.7
Surgery intention										
Surgery as primary treatment	90	22.8	82	21.6	92	22.5	77	20.9	64	18.0
Post-induction (neoadjuvant chemo- and/or radiotherapy)	287	72.7	285	75.0	301	73.8	281	76.2	280	78.7
Salvage post-radical chemo- and/or radiotherapy	18	4.6	13	3.4	15	3.7	11	3.0	12	3.4
Type of surgery										
Minimally invasive surgery (MIS)	226	57.2	246	64.7	274	67.2	262	71.0	254	71.3
Open	162	41.0	124	32.6	130	31.9	103	27.9	97	27.2
Conversion from MIS to open surgery	7	1.8	10	2.6	4	1.0	4	1.1	5	1.4
RIZIV code for complex surgery										
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	1	0.3	0	0.0	0	0.0	0	0.0	4	1.1
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	0	0.0	1	0.3	0	0.0	1	0.3	0	0.0

Characteristic	Belgium (N=1,908)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	107	27.1	126	33.2	112	27.5	118	32.0	95	26.7
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	287	72.7	253	66.6	296	72.5	250	67.8	257	72.2
Oesophagectomy										
Partial	132	33.4	181	47.6	152	37.3	140	37.9	128	36.0
Subtotal	263	66.6	199	52.4	256	62.7	229	62.1	228	64.0
Antithrombotic medication										
No	317	80.3	302	79.5	340	83.3	296	80.2	283	79.5
Yes	78	19.7	78	20.5	68	16.7	73	19.8	73	20.5
Was the patient referred?										
No	99	25.1	88	23.2	79	19.4	83	22.5	79	22.2
Yes	296	74.9	292	76.8	329	80.6	286	77.5	277	77.8

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result per year (BE).

* Tumours for which staging is not possible.

** Neoadjuvant treatment: patients who received either chemotherapy, targeted therapy, 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. Combinations of prior surgery, endoscopic and neoadjuvant treatments could also occur.

Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

3.1.2. Completeness of registration

The indicator 'completeness of cases' calculates for how many patients surgery was performed in the fifth convention year and how many of these were actually registered within the complex surgery database. These calculations 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 fifth convention year.

Table 3: Completeness of cases: Total number of patients with performed surgeries registered by all recognised Belgian centres.

	Belgium, recognised centres		
	n registered	N performed	n/N (%)
<i>Patients with surgery in Year 5</i>	371	371	100.0
<i>Expert centres</i>			
S1	49	49	100.0
S2	106	106	100.0
S3	31	31	100.0
S4	39	39	100.0
S6	42	42	100.0
S8	27	27	100.0
S9	24	24	100.0
S10	53	53	100.0

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

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

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

Table 4: Completeness of registration forms: Number of registrations in complex surgery database that were complete, by expert centre in the fifth convention year.

Characteristic	Belgium		
	N registered	n complete	n/N (%)
<i>Patients discussed on a MC in Year 5</i>	958	954	99.6
<i>Surgery status</i>			
Patients with surgery	371	368	99.2
Patients without surgery	587	586	99.8
<i>Expert centres</i>			
S1	85	85	100.0
S2	257	256	99.6
S3	54	53	98.1
S4	130	130	100.0
S6	83	83	100.0
S8	119	119	100.0
S9	82	80	97.6
S10	148	148	100.0
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).			

3.2. Process indicators

3.2.1. Time between confirmed diagnosis (pathological anatomy) and start of first treatment

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

Table 5: Proportion of operated patients in the five convention years for whom first treatment started within 4 weeks since (anatomopathological) diagnosis (**only for standard surgery**).

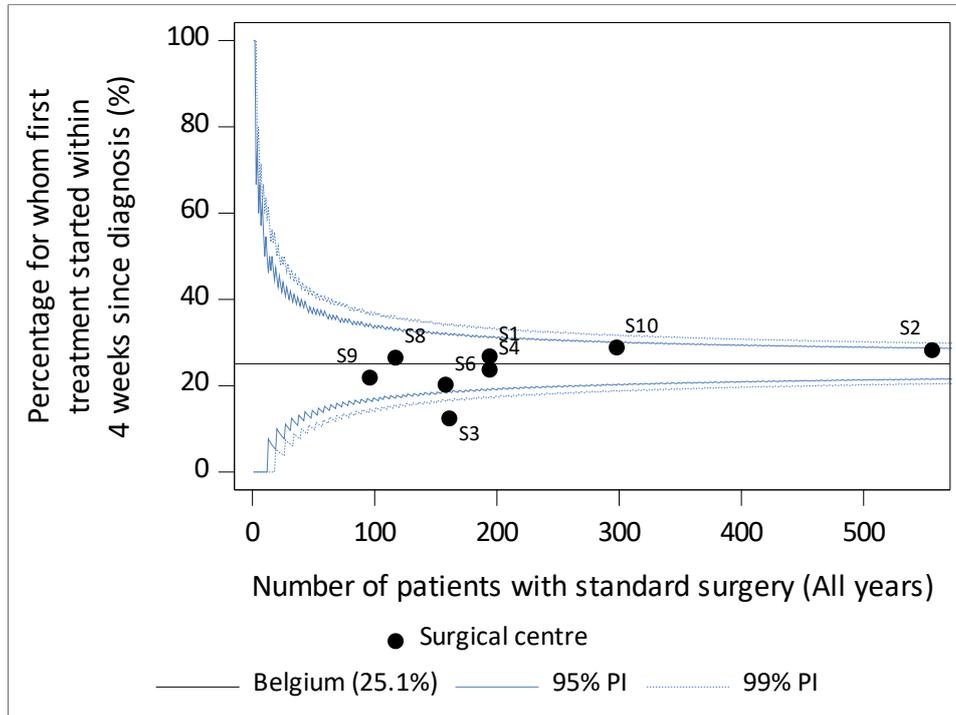
Characteristic	Belgium				
	N	N miss*	n	n/N (%)	95% CI
Patients with standard surgery	1,898	10	481	25.3	[23.4, 27.4]
Convention year					
Year 1	390	5	99	25.4	[21.1, 30.0]
Year 2	375	5	122	32.5	[27.8, 37.5]
Year 3	408	0	103	25.2	[21.1, 29.8]
Year 4	369	0	82	22.2	[18.1, 26.8]
Year 5	356	0	75	21.1	[16.9, 25.7]
Referral status					
Operated patients referred to an expert centre	1,473	7	366	24.8	[22.7, 27.1]
Operated patients without referral	425	3	115	27.1	[22.9, 31.6]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

* Time difference not available because start of treatment is before date of diagnosis.

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

(a)



(b)

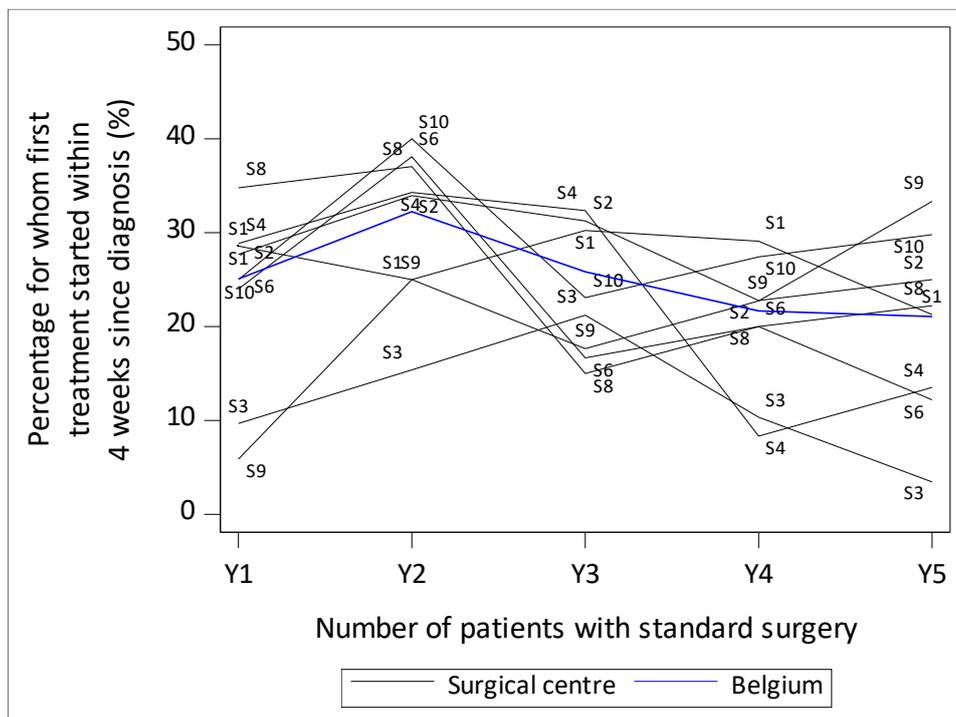
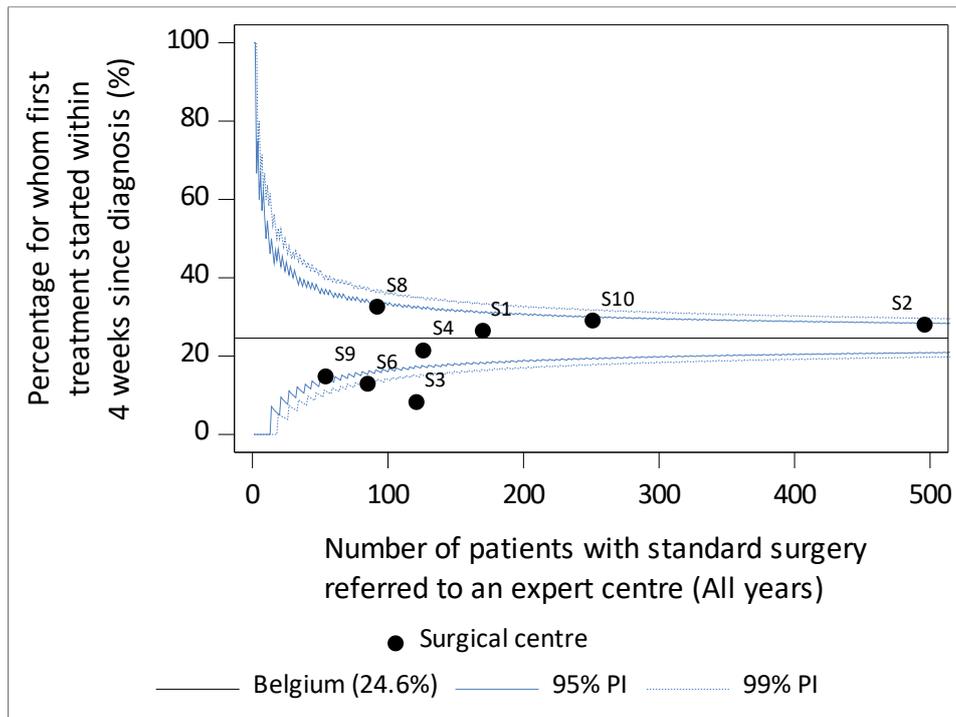


Figure 4: Funnel and spaghetti plot of the proportion of operated patients **referred to** an expert centre for whom first treatment started within 4 weeks since (anatomopathological) diagnosis (**only for standard surgery**), per centre for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

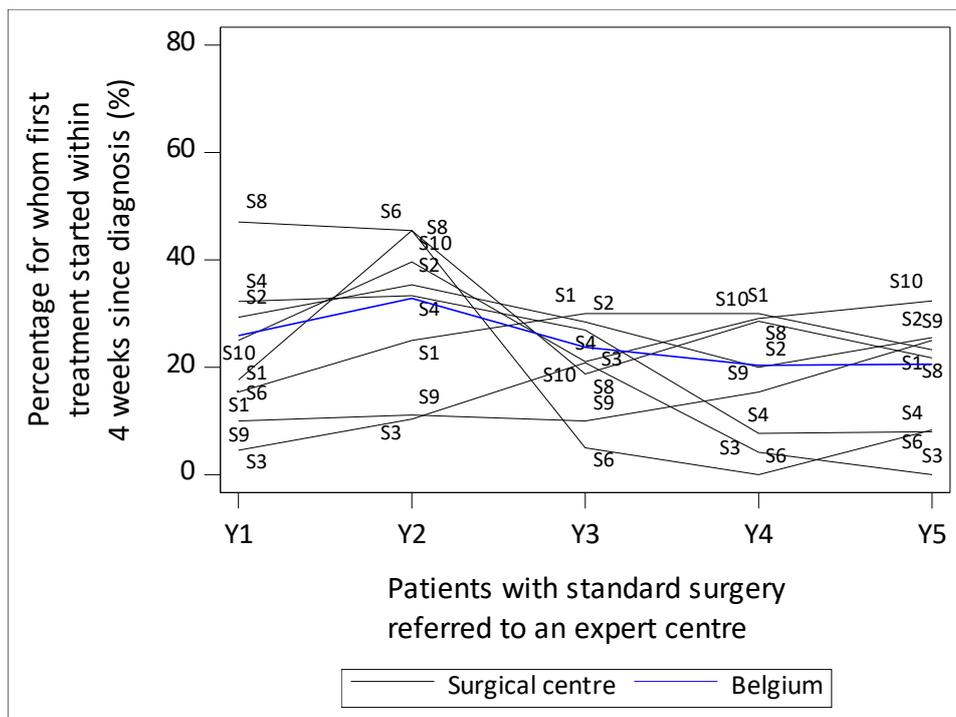
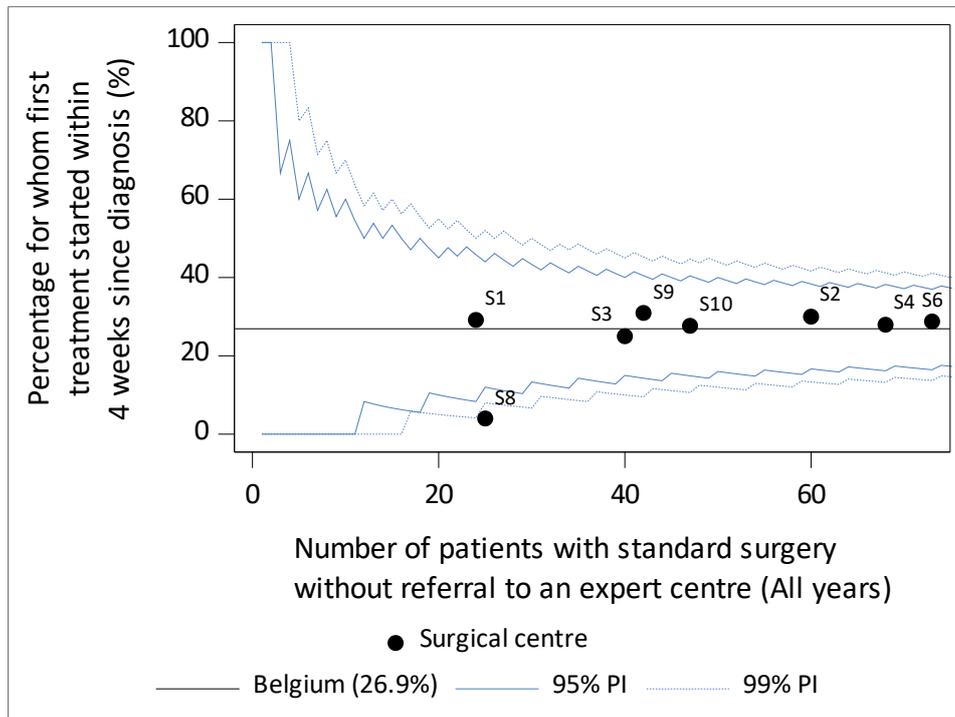


Figure 5: Funnel and spaghetti plot of the proportion of operated patients **without referral** (= direct presentation at expert centre) for whom first treatment started within 4 weeks since (anatomopathological) diagnosis (**only for standard surgery**), per centre, for (a) all years combined, (b) evolution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

(a)



(b)

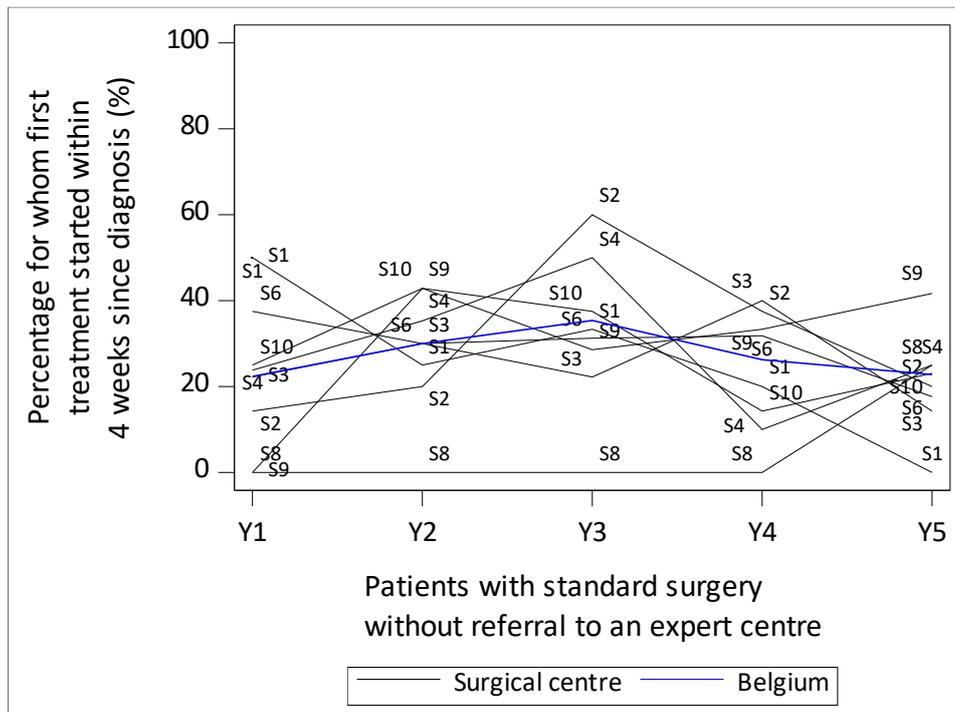


Table 6: Median time between (anatomopathological) diagnosis and start of first treatment in the five convention years (**only for standard surgery**).

Characteristic	Belgium				
	N	N miss*	Median (days)	IQR**	P90***
<i>Patients with standard surgery</i>	1,898	10	39	[28, 50]	68
<i>Convention year</i>					
Year 1	390	5	36	[28, 49]	63
Year 2	375	5	37	[26, 48]	62
Year 3	408	0	39	[28, 49]	63
Year 4	369	0	41	[30, 55]	72
Year 5	356	0	42	[30, 54]	77
<i>Referral status</i>					
Operated patients referred to an expert centre	1,473	7	40	[29, 50]	68
Operated patients without referral	425	3	37	[28, 51]	67

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

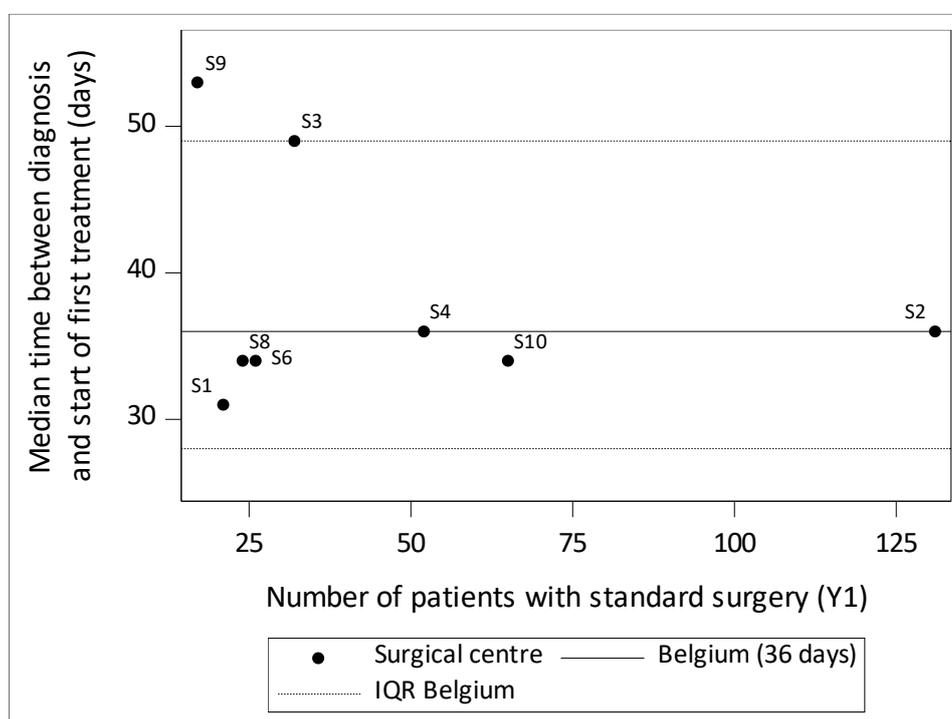
* Time difference not available because start of treatment is before date of diagnosis.

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

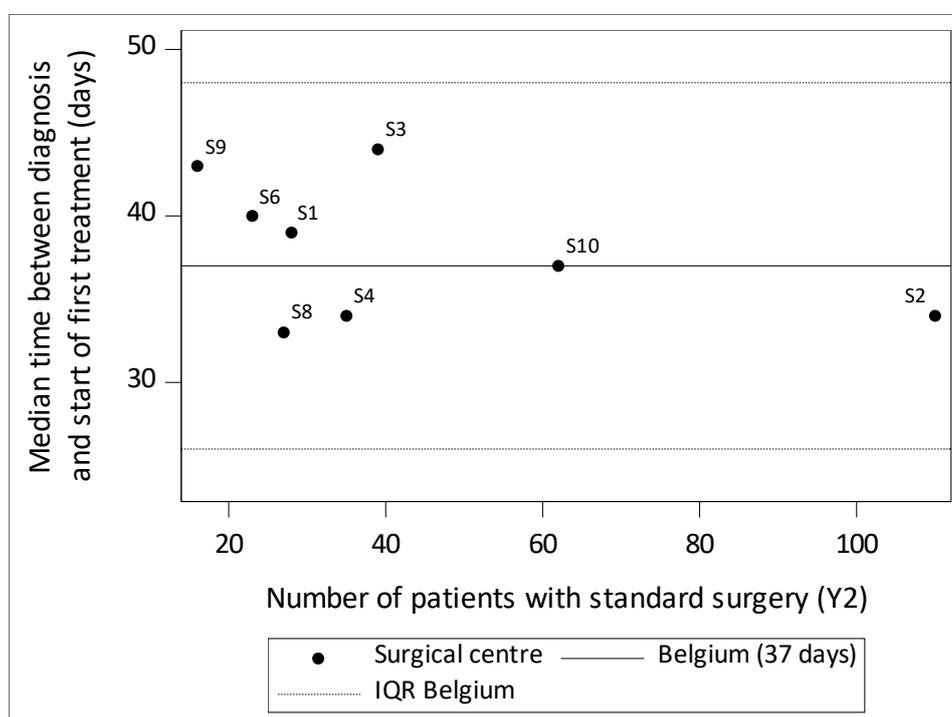
*** 90th percentile

Figure 6: Median time between (anatomopathological) diagnosis and start of first treatment (**only for standard surgery**), per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 and (f) all years combined.

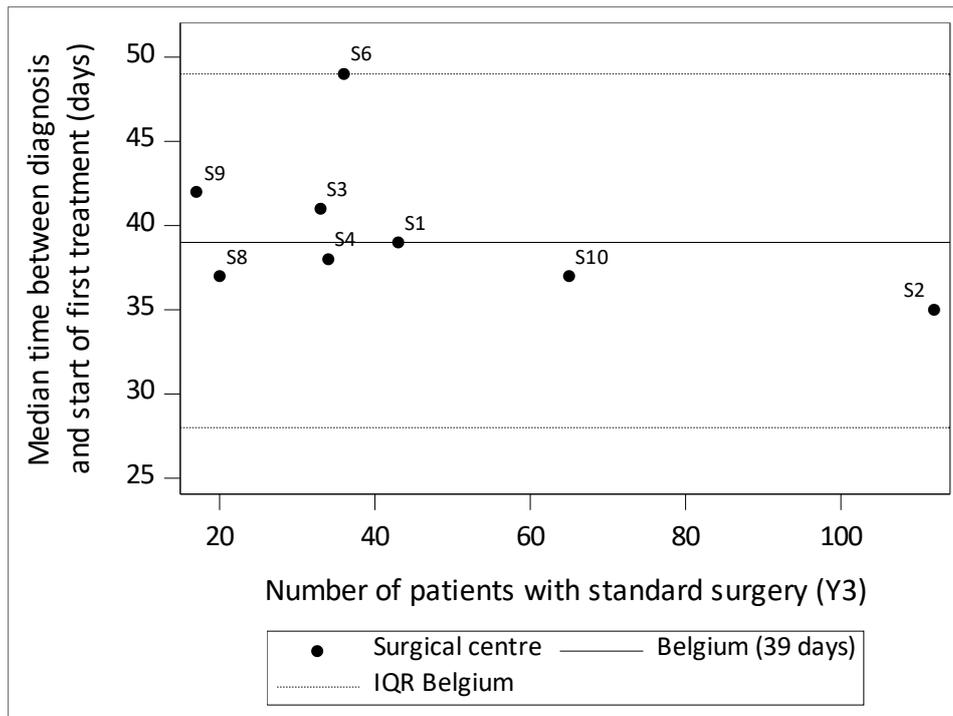
(a)



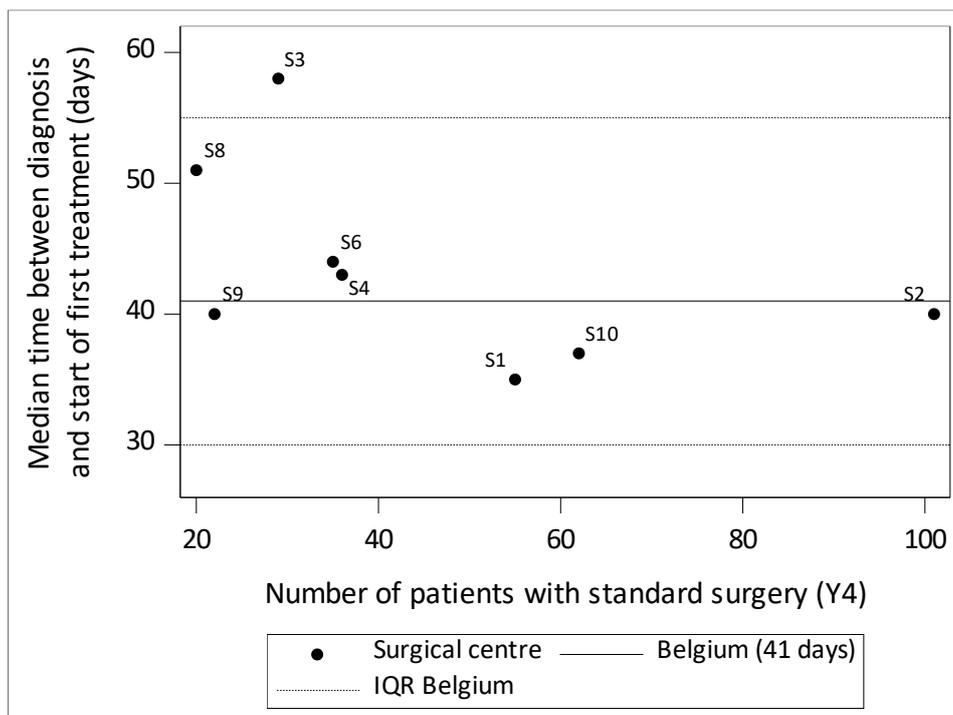
(b)



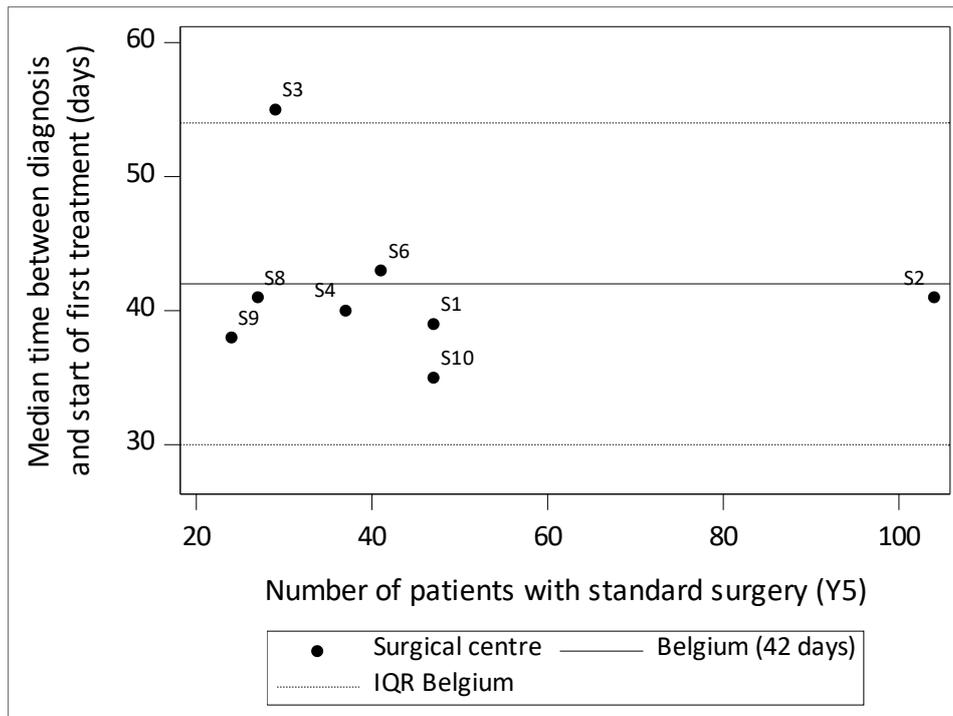
(c)



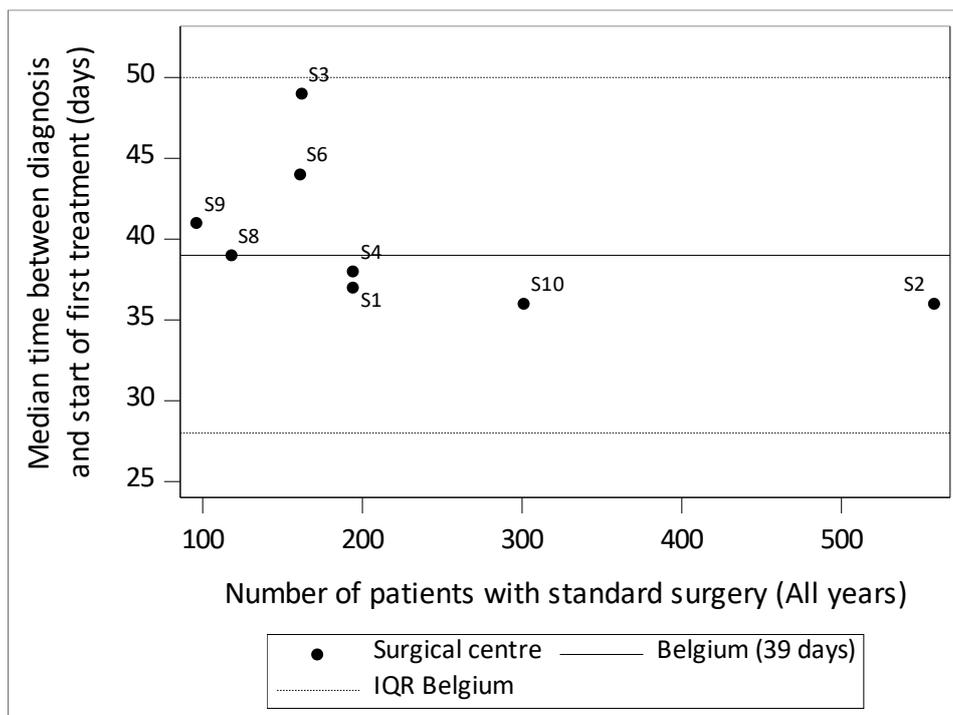
(d)



(e)



(f)



3.2.2. Length of stay in the expert centre

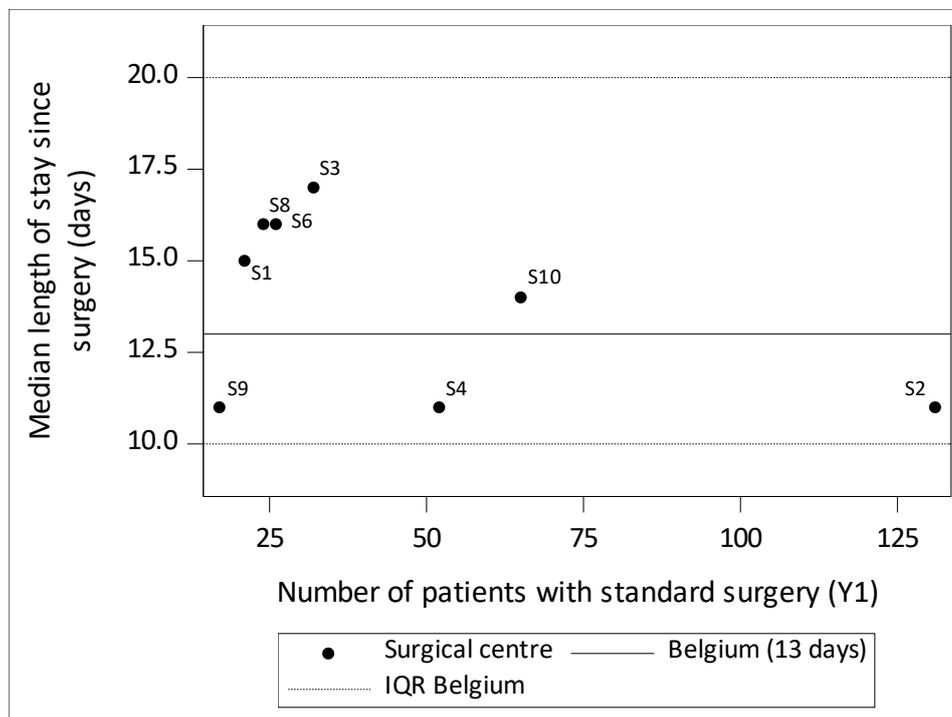
Table 7: Length of stay in an expert centre for all operated patients in the five convention years (only for standard surgery).

Characteristic	Belgium		
	N	Median (days)	IQR*
<i>Patients with standard surgery</i> ¹	1,908	12	[9, 21]
<i>Convention year</i>			
Year 1	395	13	[10, 20]
Year 2	380	12	[9, 22]
Year 3	408	12	[9, 20]
Year 4	369	13	[9, 21]
Year 5	356	12	[9, 21]

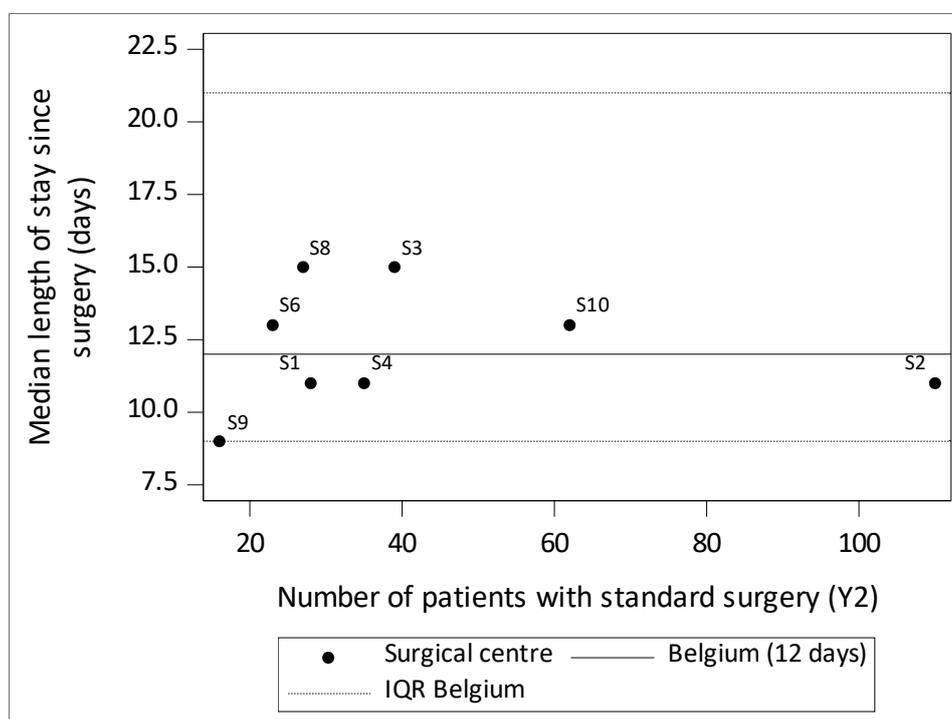
Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.
¹ length of stay longer than 90 days was truncated at 90 days.
* Interquartile Range=[the 25th, and 75th percentiles of the data]

Figure 7: Median length of stay for operated patients (**only for standard surgery**), per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 and (f) all years combined.

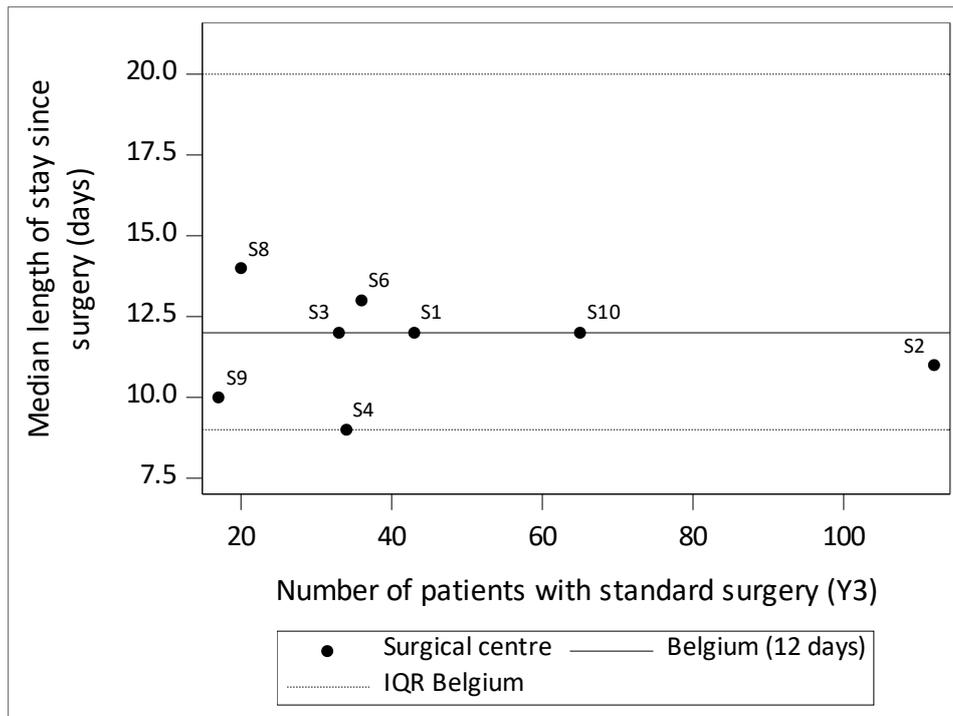
(a)



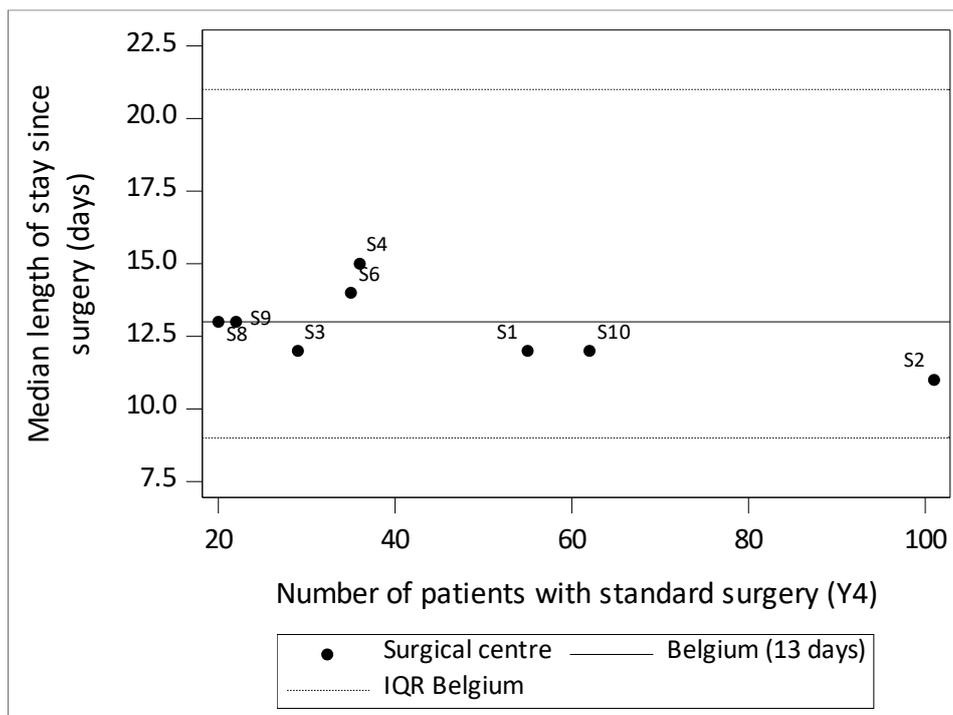
(b)



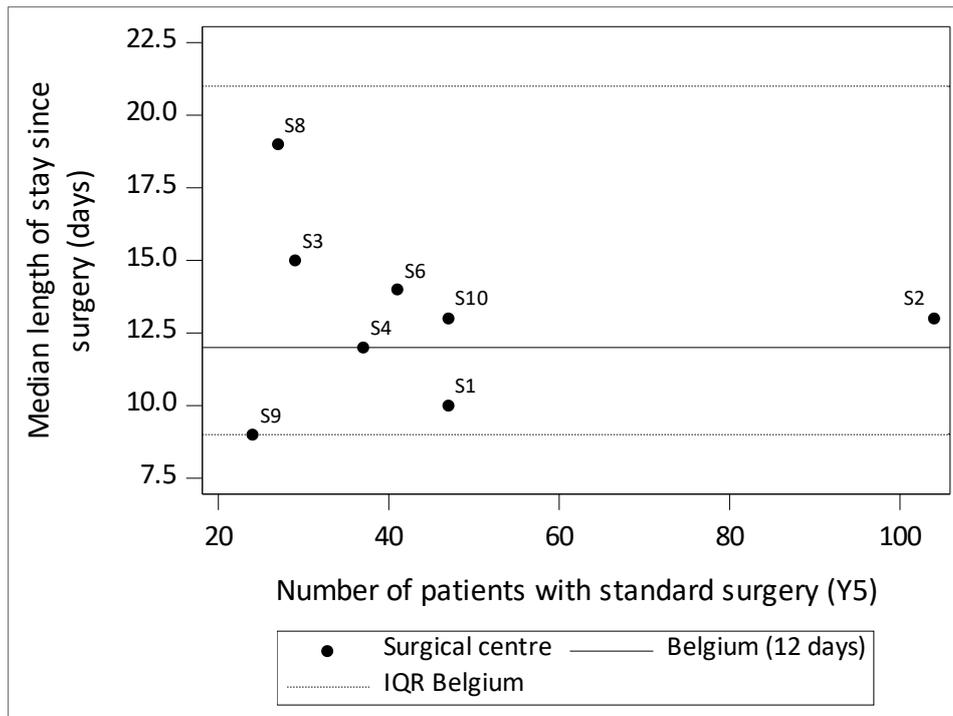
(c)



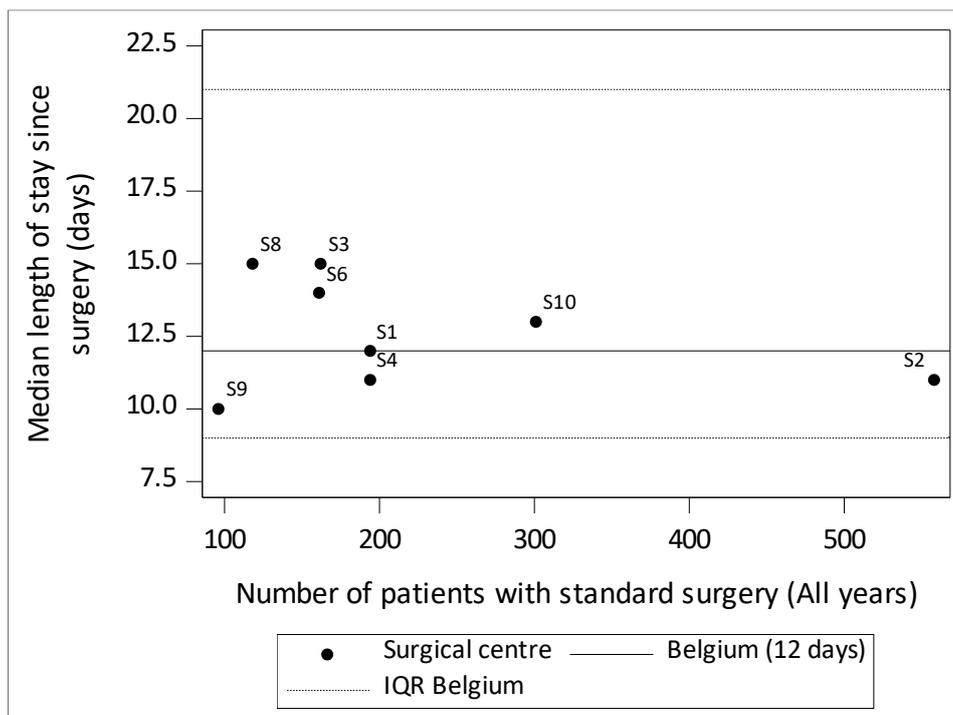
(d)



(e)



(f)



3.2.3. Proportion of operated patients with ≥ 15 lymph nodes examined

Table 8: Proportion of operated patients in the five convention years for whom ≥ 15 lymph nodes were examined (**only for standard surgery**).

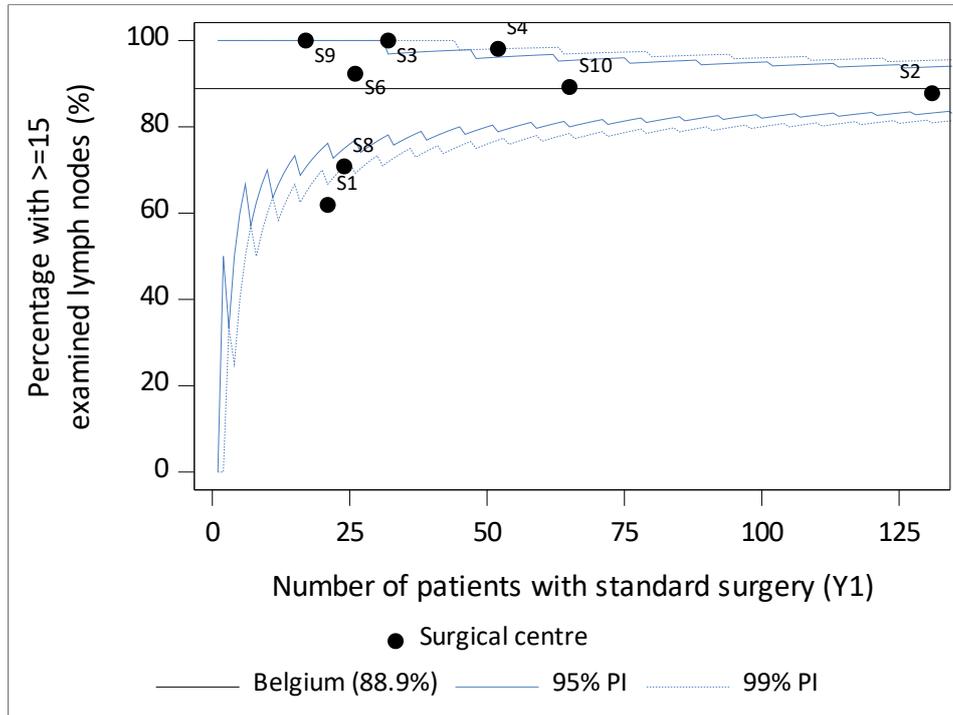
Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Patients with standard surgery	1,908	1,763	92.4	[91.1, 93.5]
Expert centres				
S1	194	186	95.9	[92.0, 98.2]
S2	558	510	91.4	[88.8, 93.6]
S3	162	158	97.5	[93.8, 99.3]
S4	194	189	97.4	[94.1, 99.2]
S5	64	52	81.3	[69.5, 89.9]
S6	161	150	93.2	[88.1, 96.5]
S7	60	45	75.0	[62.1, 85.3]
S8	118	98	83.1	[75.0, 89.3]
S9	96	95	99.0	[94.3, 100.0]
S10	301	280	93.0	[89.5, 95.6]
Convention year				
Year 1	395	346	87.6	[83.9, 90.7]
Year 2	380	353	92.9	[89.8, 95.3]
Year 3	408	375	91.9	[88.8, 94.4]
Year 4	369	351	95.1	[92.4, 97.1]
Year 5	356	338	94.9	[92.1, 97.0]
Surgery intention				
Surgery as primary treatment	405	376	92.8	[89.9, 95.2]
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1,434	1,327	92.5	[91.1, 93.8]
Salvage post-radical chemo- and/or radiotherapy	69	60	87.0	[76.7, 93.9]
Morphology				
Adenocarcinoma	1,429	1,319	92.3	[90.8, 93.6]
Squamous cell carcinoma	444	416	93.7	[91.0, 95.8]
Other, unspecified or missing	35	28	80.0	[63.1, 91.6]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

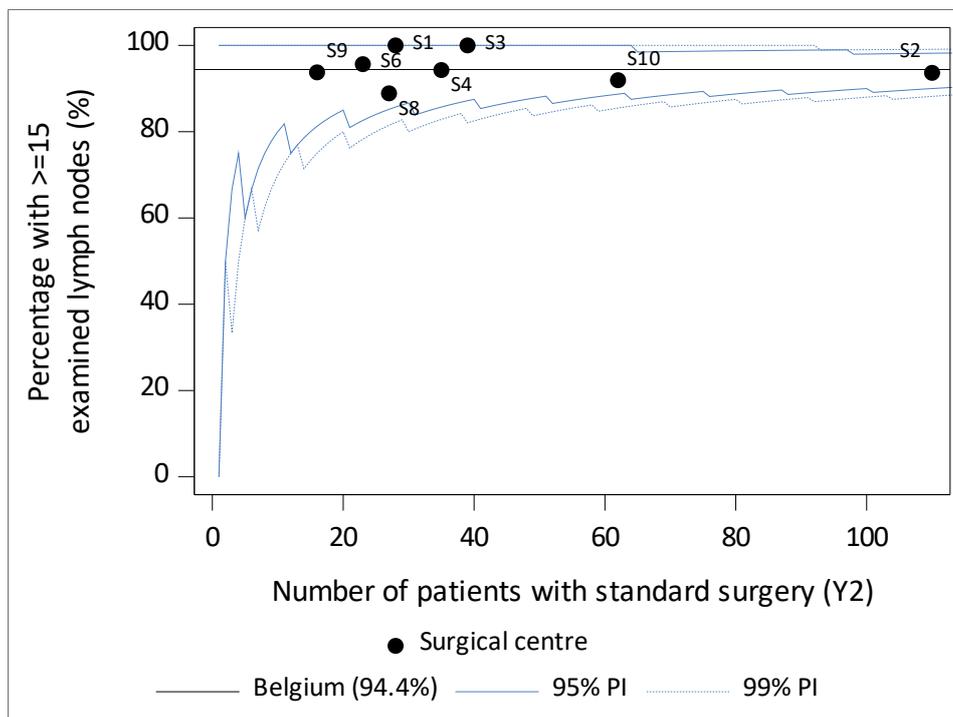
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

Figure 8: Funnel and spaghetti plot of the proportion of operated patients with ≥ 15 lymph nodes examined (only for standard surgery), per centre, (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) all years combined, (g) evolution year 1, 2, 3, 4 and 5.

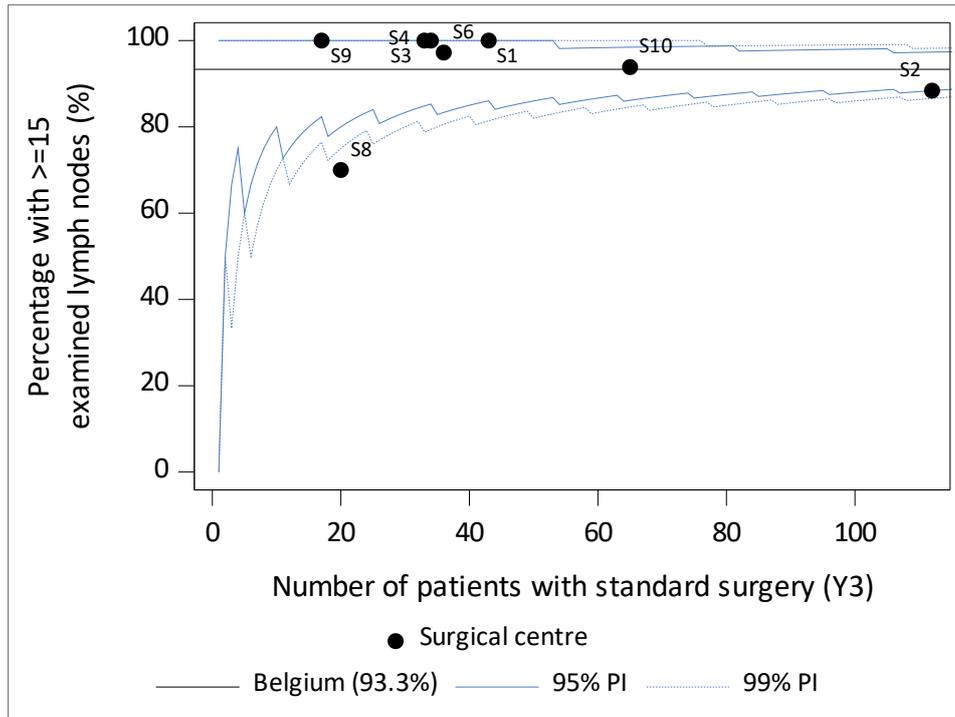
(a)



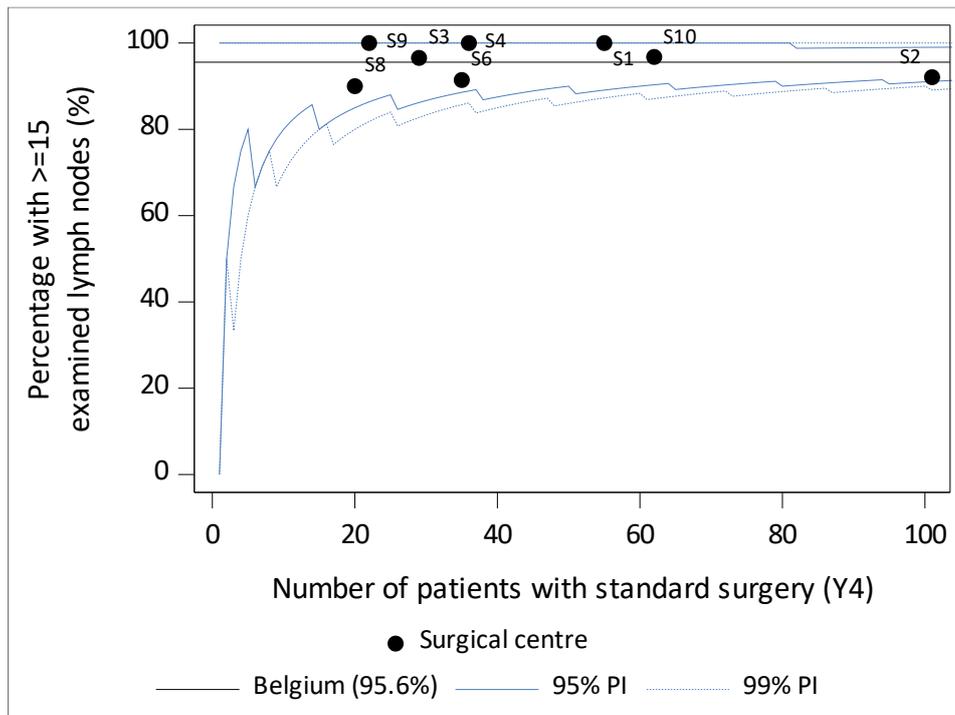
(b)



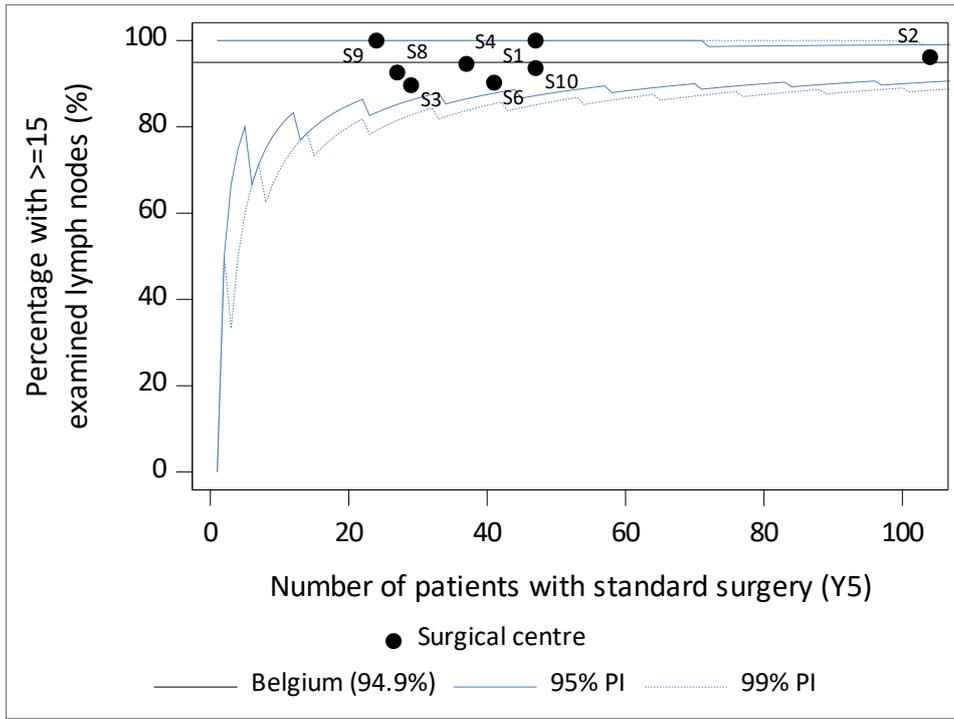
(c)



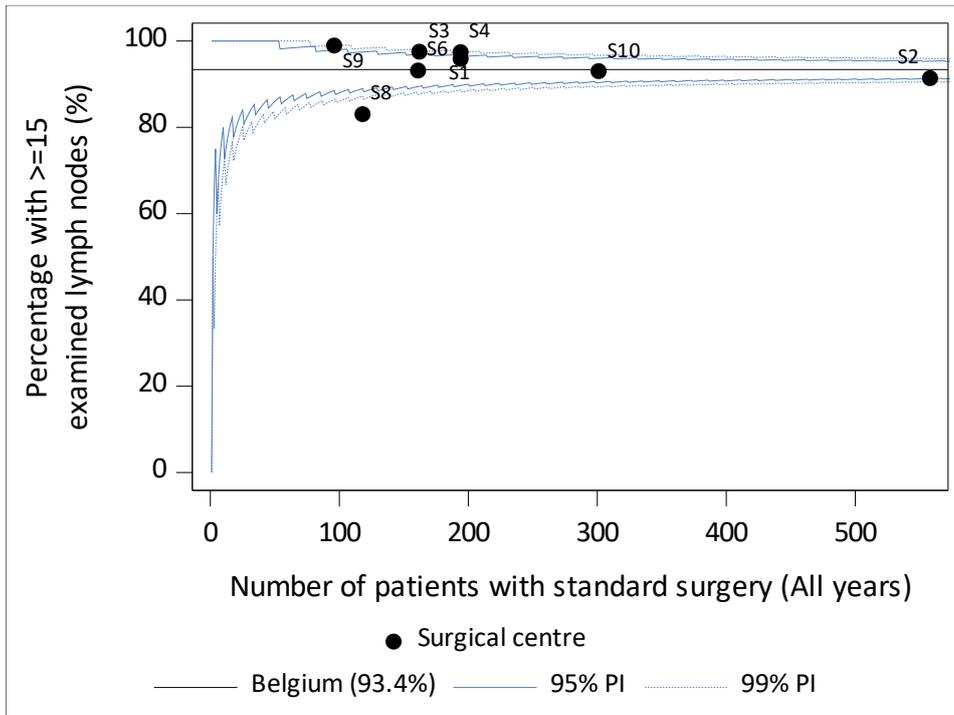
(d)



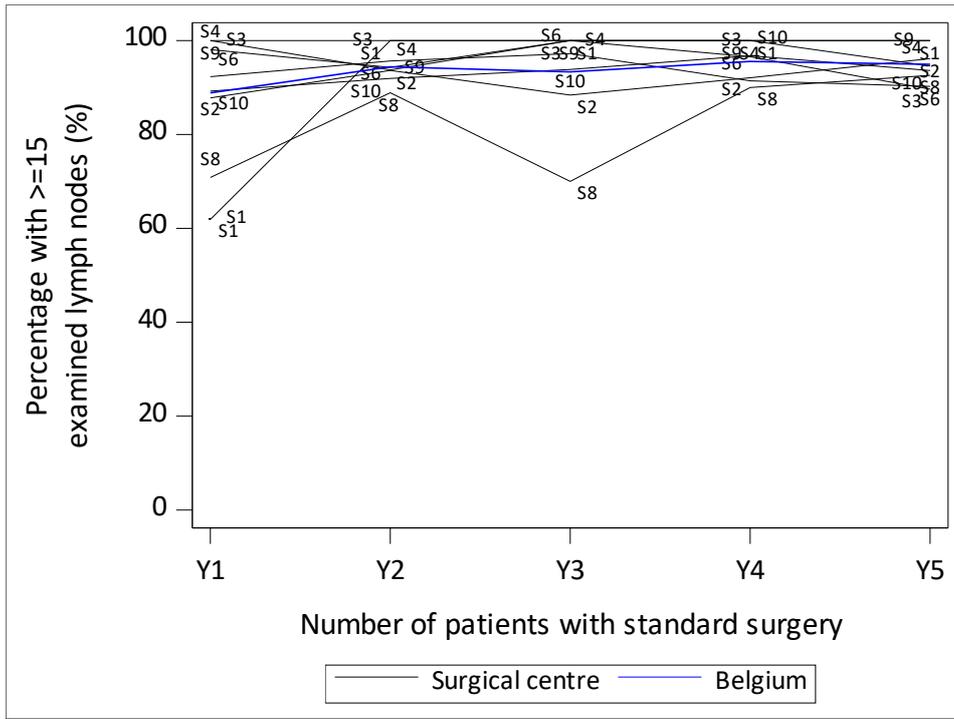
(e)



(f)



(g)



3.2.4. Proportion of operated patients for whom a PET/CT was performed

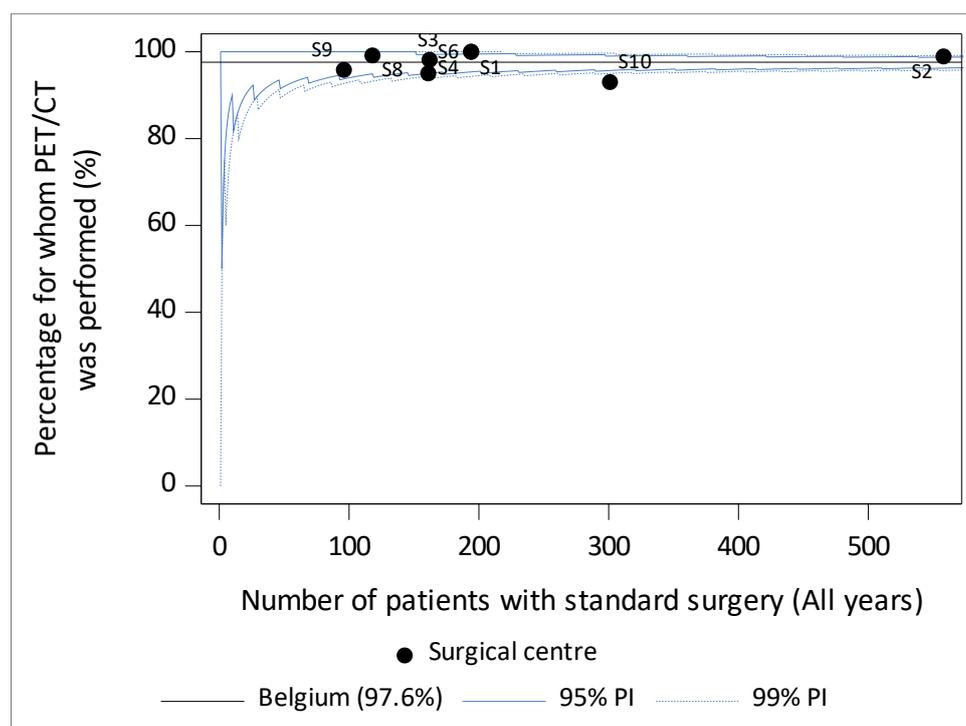
Table 9: Proportion of operated patients in the five convention years for whom a PET/CT was performed (**only for standard surgery**).

Patient group	Belgium			
	N	n	n/N (%)	95% CI
Patients with standard surgery	1,908	1,862	97.6	[96.8, 98.2]
Convention year				
Year 1	395	380	96.2	[93.8, 97.9]
Year 2	380	369	97.1	[94.9, 98.5]
Year 3	408	401	98.3	[96.5, 99.3]
Year 4	369	362	98.1	[96.1, 99.2]
Year 5	356	350	98.3	[96.4, 99.4]

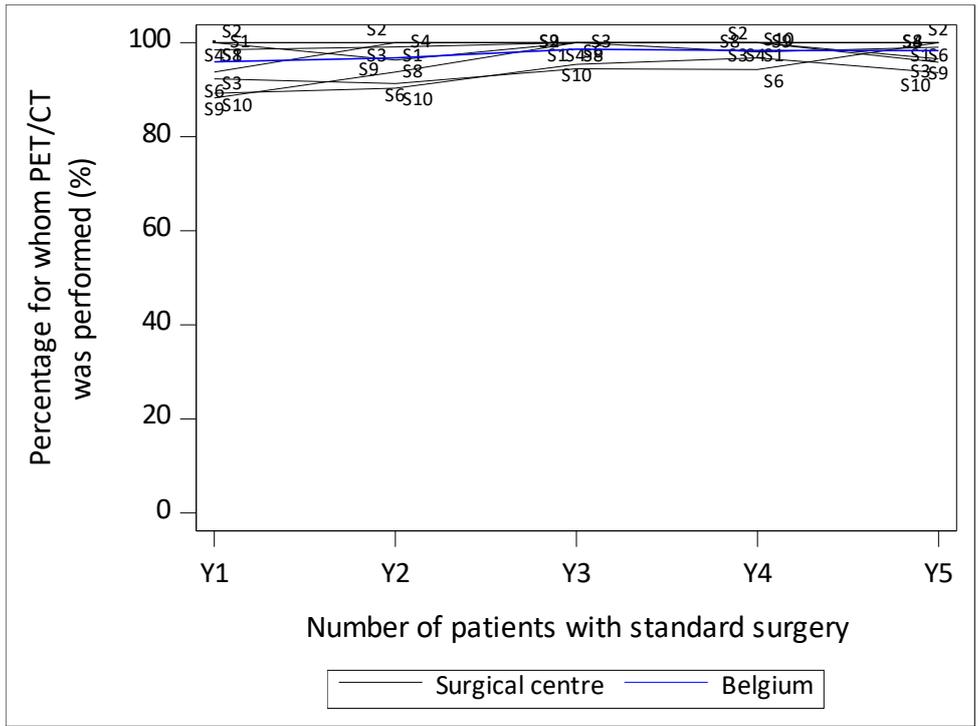
Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

Figure 9: Funnel and spaghetti plot of the proportion of operated patients for whom a PET/CT was performed (**only for standard surgery**), per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)



3.2.5. Proportion of operated patients that were pT1aN0

Table 10: Proportion of operated patients without neoadjuvant treatment that were pT1aN0 (only for standard surgery) in the five convention years.

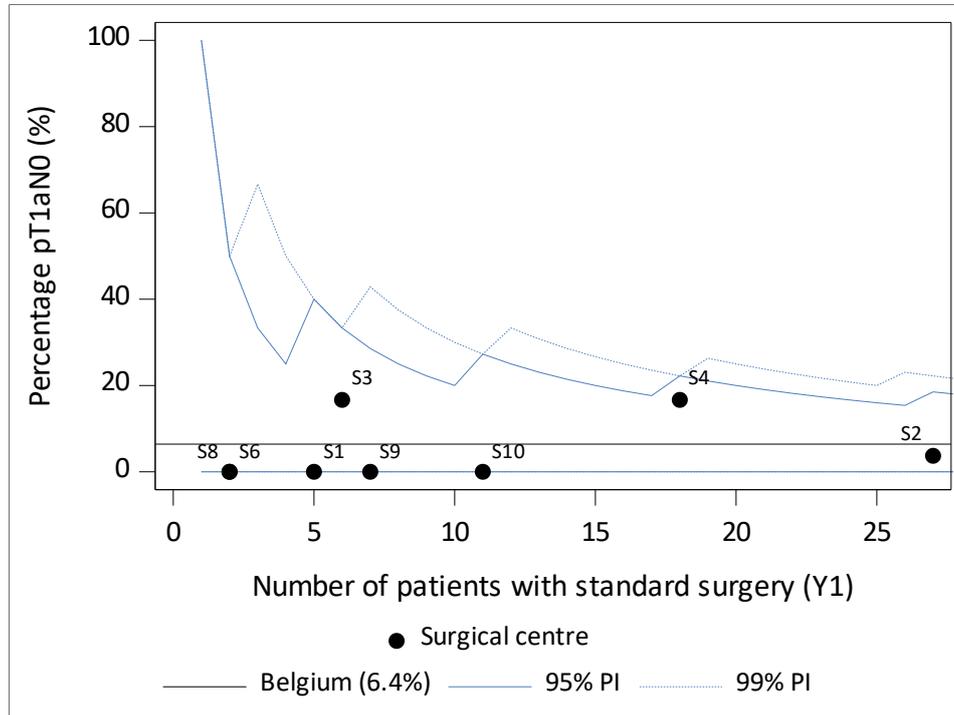
Characteristic	Belgium			
	N	n	n/N (%)	95% CI
Patients with standard surgery (no neoadjuvant treatment, no relapse)	400	39	9.8	[7.0, 13.1]
Expert centres				
S1	30	0	0.0	[0.0, 11.6]
S2	134	10	7.5	[3.6, 13.3]
S3	22	2	9.1	[1.1, 29.2]
S4	54	4	7.4	[2.1, 17.9]
S5	22	3	13.6	[2.9, 34.9]
S6	28	3	10.7	[2.3, 28.2]
S7	17	2	11.8	[1.5, 36.4]
S8	26	8	30.8	[14.3, 51.8]
S9	20	2	10.0	[1.2, 31.7]
S10	47	5	10.6	[3.5, 23.1]
Convention year				
Year 1	89	7	7.9	[3.2, 15.5]
Year 2	84	10	11.9	[5.9, 20.8]
Year 3	88	9	10.2	[4.8, 18.5]
Year 4	76	7	9.2	[3.8, 18.1]
Year 5	63	6	9.5	[3.6, 19.6]
Type of surgery				
Minimally invasive surgery (MIS)	262	29	11.1	[7.5, 15.5]
Open	128	8	6.3	[2.7, 11.9]
Conversion from MIS to open surgery	10	2	20.0	[2.5, 55.6]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

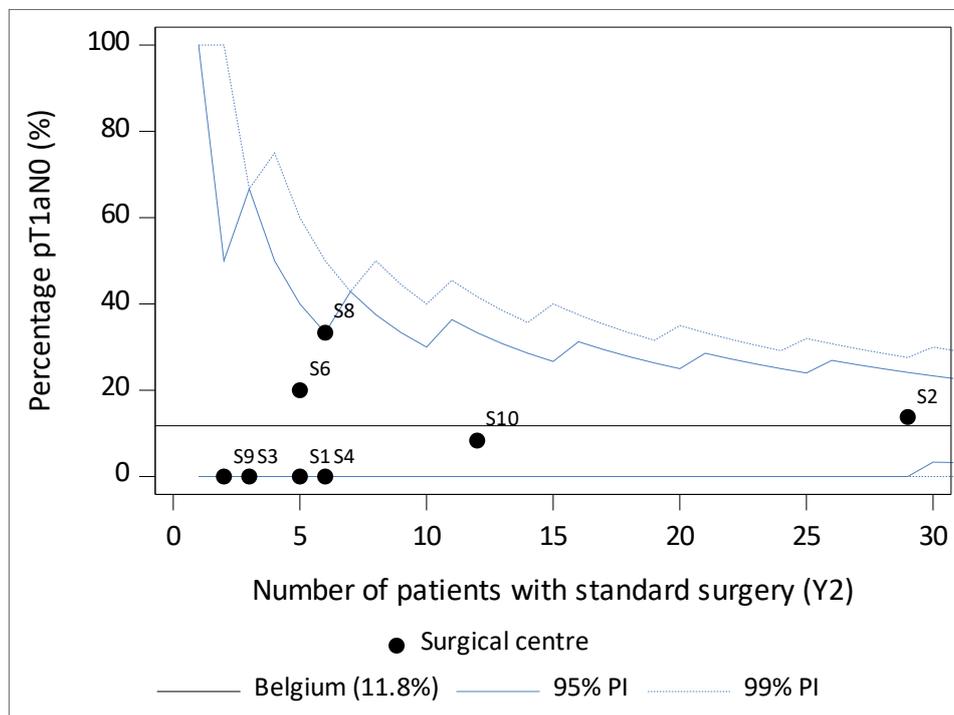
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

Figure 10: Funnel and spaghetti plot of the proportion of operated patients without neoadjuvant treatment that were pT1aNO in the five convention years (**only for standard surgery**), per centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) all years combined, (g) evolution year 1, 2, 3, 4 and 5.

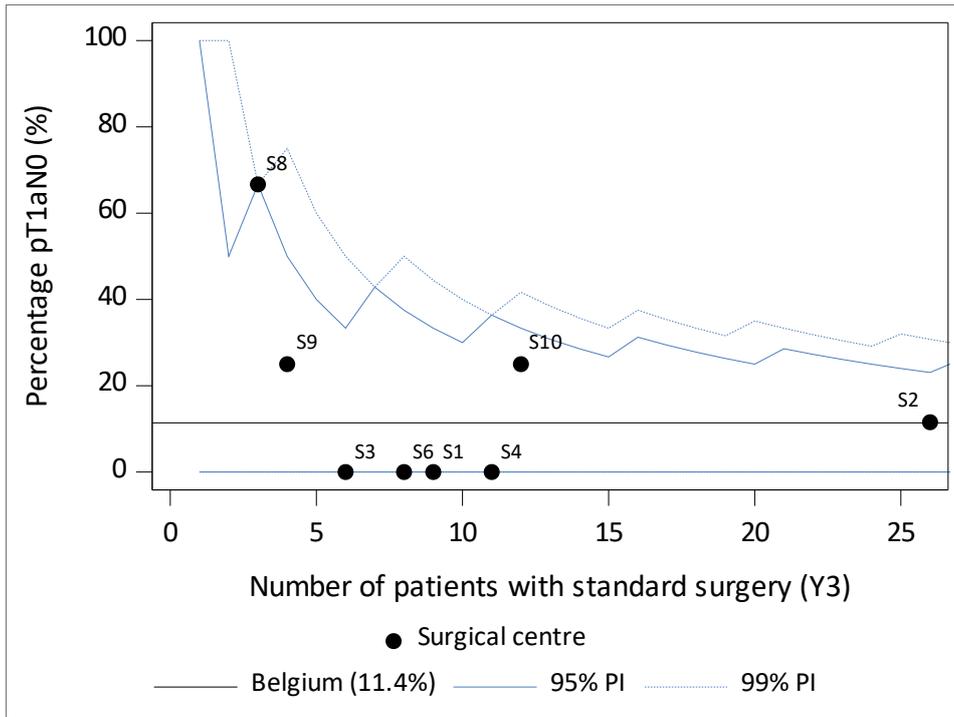
(a)



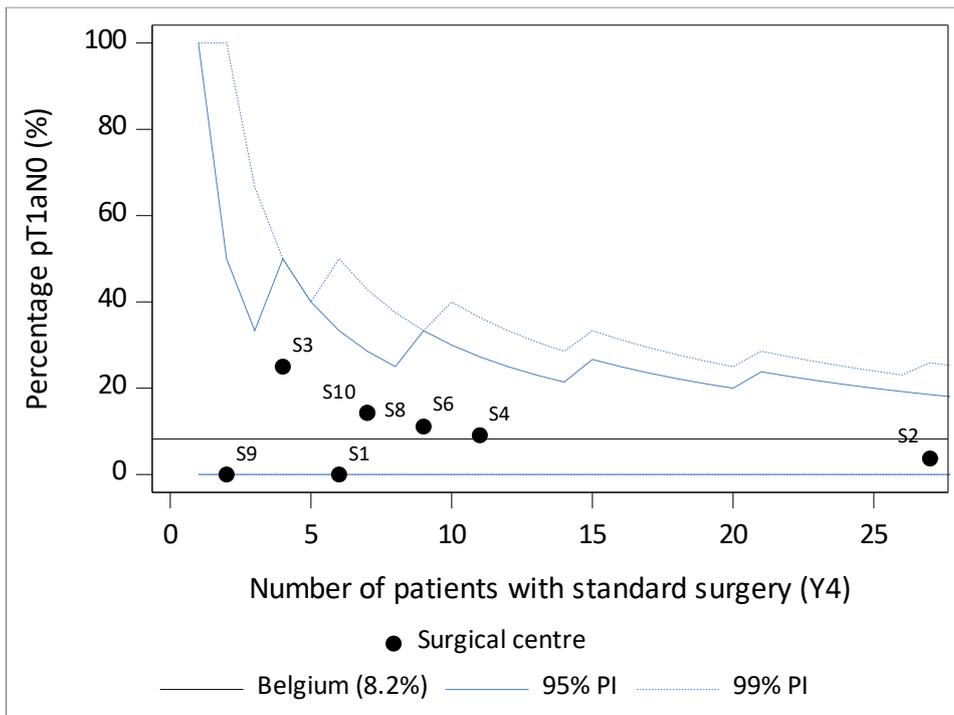
(b)



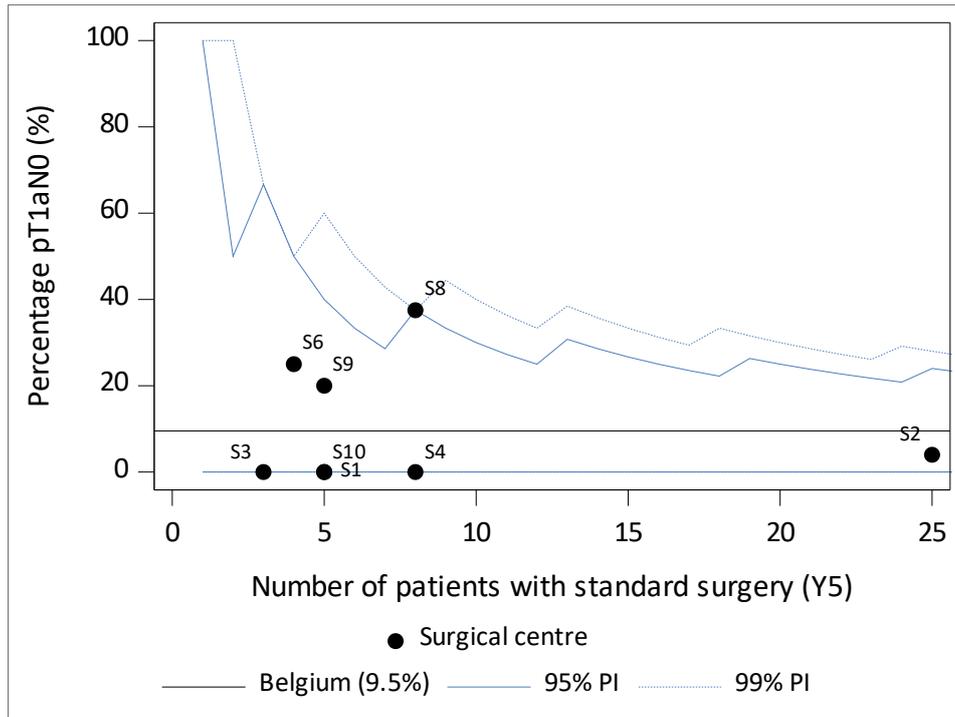
(c)



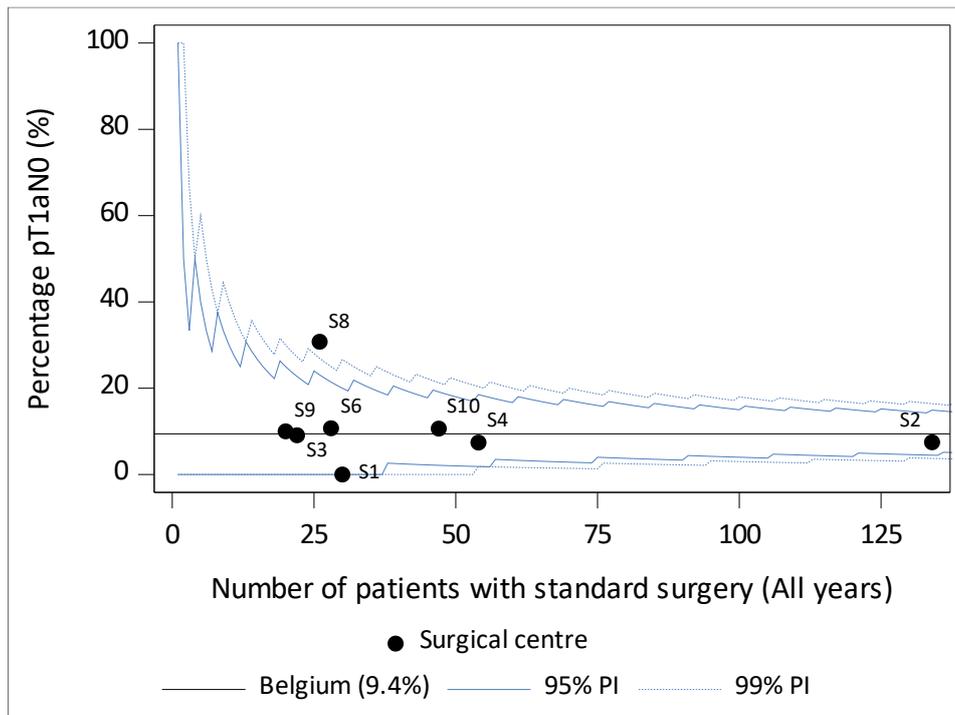
(d)



(e)



(f)



3.3. Outcome indicators

3.3.1. Postoperative mortality

3.3.1.1 Unadjusted 30-day postoperative mortality

Table 11: Unadjusted 30-day postoperative mortality in the five convention years, by mode of surgery and by age, for the total malignant population.

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Patients with surgery	2,000	44	2.2	[1.6, 2.9]
Expert centres				.
S1	202	3	1.5	[0.3, 4.3]
S2	579	10	1.7	[0.8, 3.2]
S3	167	6	3.6	[1.3, 7.7]
S4	207	5	2.4	[0.8, 5.5]
S5	66	1	1.5	[0.0, 8.2]
S6	166	2	1.2	[0.1, 4.3]
S7	61	4	6.6	[1.8, 15.9]
S8	125	3	2.4	[0.5, 6.9]
S9	96	3	3.1	[0.6, 8.9]
S10	331	7	2.1	[0.9, 4.3]
Convention year				
Year 1	418	13	3.1	[1.7, 5.3]
Year 2	404	16	4.0	[2.3, 6.4]
Year 3	420	5	1.2	[0.4, 2.8]
Year 4	387	5	1.3	[0.4, 3.0]
Year 5	371	5	1.3	[0.4, 3.1]
Mode of surgery				
Non-standard surgery	92	8	8.7	[3.8, 16.4]
Standard surgery	1,908	36	1.9	[1.3, 2.6]
Age at surgery				
<=69	1,226	18	1.5	[0.9, 2.3]
70-79	662	23	3.5	[2.2, 5.2]
>=80	112	3	2.7	[0.6, 7.6]

Non-standard surgery = emergency, palliative, recurrence, total laryngectomy
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

Table 12: Unadjusted 30-day postoperative mortality in the five convention years, by patient and tumour characteristics for the **standard surgery only**.

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Patients with standard surgery	1,908	36	1.9	[1.3, 2.6]
Expert centres				.
S1	194	2	1.0	[0.1, 3.7]
S2	558	8	1.4	[0.6, 2.8]
S3	162	6	3.7	[1.4, 7.9]
S4	194	3	1.5	[0.3, 4.5]
S5	64	1	1.6	[0.0, 8.4]
S6	161	2	1.2	[0.2, 4.4]
S7	60	4	6.7	[1.8, 16.2]
S8	118	3	2.5	[0.5, 7.3]
S9	96	3	3.1	[0.6, 8.9]
S10	301	4	1.3	[0.4, 3.4]
Convention year				
Year 1	395	10	2.5	[1.2, 4.6]
Year 2	380	13	3.4	[1.8, 5.8]
Year 3	408	5	1.2	[0.4, 2.8]
Year 4	369	5	1.4	[0.4, 3.1]
Year 5	356	3	0.8	[0.2, 2.4]
Sex				
Male	1,515	32	2.1	[1.4, 3.0]
Female	393	4	1.0	[0.3, 2.6]
Age at surgery				
<=69	1,164	15	1.3	[0.7, 2.1]
70-79	635	19	3.0	[1.8, 4.6]
>=80	109	2	1.8	[0.2, 6.5]
Lesion to treat (in oesophagus/GOJ)				
Primary tumour	1,863	35	1.9	[1.3, 2.6]
Relapse of primary tumour	41	1	2.4	[0.1, 12.9]
Metastasis	4	0	0.0	[0.0, 60.2]
Morphology				
Adenocarcinoma	1,429	23	1.6	[1.0, 2.4]
Squamous cell carcinoma	444	13	2.9	[1.6, 5.0]
Other, unspecified or missing	35	0	0.0	[0.0, 10.0]
Primary tumour localisation				
C15.0/C15.3 Cervical/upper third oesophagus	49	3	6.1	[1.3, 16.9]
C15.1/C15.4 Thoracic/middle third oesophagus	246	7	2.8	[1.2, 5.8]

Unadjusted 30-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
C15.2/C15.5 Abdominal/lower third oesophagus	919	14	1.5	[0.8, 2.5]
C15.8 Overlapping lesion of oesophagus	11	0	0.0	[0.0, 28.5]
C15.9 Oesophagus, NOS	1	0	0.0	[0.0, 97.5]
C16.0 Gastro-oesophageal junction	677	12	1.8	[0.9, 3.1]
Other	5	0	0.0	[0.0, 52.2]
Clinical stage				
0	16	0	0.0	[0.0, 20.6]
I	170	8	4.7	[2.1, 9.1]
II	354	8	2.3	[1.0, 4.4]
III	935	13	1.4	[0.7, 2.4]
IV	333	6	1.8	[0.7, 3.9]
IVA [#]	266	4	1.5	[0.4, 3.8]
IVB [#]	63	2	3.2	[0.4, 11.0]
X	48	1	2.1	[0.1, 11.1]
TNM not applicable or relapse	52	0	0.0	[0.0, 6.8]
Prior surgery or endoscopic treatment *				
Prior major thoracic or abdominal surgery	161	3	1.9	[0.4, 5.3]
Endoscopic treatment	102	3	2.9	[0.6, 8.4]
- EMR/ESD	102	3	2.9	[0.6, 8.4]
- RFA	4	0	0.0	[0.0, 60.2]
- Ablation techniques other than RFA	0			–
Other treatment modality (that could affect the oesophagus)	31	1	3.2	[0.1, 16.7]
Neoadjuvant treatment				
Chemotherapy	521	7	1.3	[0.5, 2.7]
Targeted therapy/biologicals	21	0	0.0	[0.0, 16.1]
Radiotherapy	1	0	0.0	[0.0, 97.5]
Chemoradiotherapy	977	13	1.3	[0.7, 2.3]
No chemo, radiation or targeted treatment	408	16	3.9	[2.3, 6.3]
Charlson Comorbidity Index				
0	796	11	1.4	[0.7, 2.5]
1	505	6	1.2	[0.4, 2.6]
2	308	9	2.9	[1.3, 5.5]
3	166	3	1.8	[0.4, 5.2]
4	68	3	4.4	[0.9, 12.4]
5	26	1	3.8	[0.1, 19.6]
6	17	2	11.8	[1.5, 36.4]
7	14	0	0.0	[0.0, 23.2]
8	5	0	0.0	[0.0, 52.2]
9	3	1	33.3	[0.8, 90.6]

Characteristic	Unadjusted 30-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
WHO score at surgery				
0 - Asymptomatic, normal activity	510	4	0.8	[0.2, 2.0]
1 - Symptomatic, but ambulant	1,142	24	2.1	[1.4, 3.1]
2 - Symptomatic, bedbound < 50% day	209	6	2.9	[1.1, 6.1]
3 - Symptomatic, bedbound > 50% day	42	2	4.8	[0.6, 16.2]
4 - Completely dependent, 100% bedbound	5	0	0.0	[0.0, 52.2]
ASA score				
1 - Healthy person	64	0	0.0	[0.0, 5.6]
2 - Mild systemic disease, normal activity	799	11	1.4	[0.7, 2.4]
3 - Serious systemic disease, limited activity	1,021	25	2.4	[1.6, 3.6]
4 - Life-threatening illness, handicapped	24	0	0.0	[0.0, 14.2]
Surgery intention				
Surgery as primary treatment	405	15	3.7	[2.1, 6.0]
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1,434	20	1.4	[0.9, 2.1]
Salvage post-radical chemo- and/or radiotherapy	69	1	1.4	[0.0, 7.8]
Type of surgery				
Minimally invasive surgery (MIS)	1,262	23	1.8	[1.2, 2.7]
Open	616	10	1.6	[0.8, 3.0]
Conversion from MIS to open surgery	30	3	10.0	[2.1, 26.5]
RIZIV code for complex surgery				
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	5	0	0.0	[0.0, 52.2]
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	2	1	50.0	[1.3, 98.7]
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	558	8	1.4	[0.6, 2.8]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	1,343	27	2.0	[1.3, 2.9]
Oesophagectomy				
Partial	733	17	2.3	[1.4, 3.7]
Subtotal	1,175	19	1.6	[1.0, 2.5]
Antithrombotic medication				
No	1,538	27	1.8	[1.2, 2.5]
Yes	370	9	2.4	[1.1, 4.6]
Was the patient referred?				
No	428	12	2.8	[1.5, 4.8]
Yes	1,480	24	1.6	[1.0, 2.4]

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

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

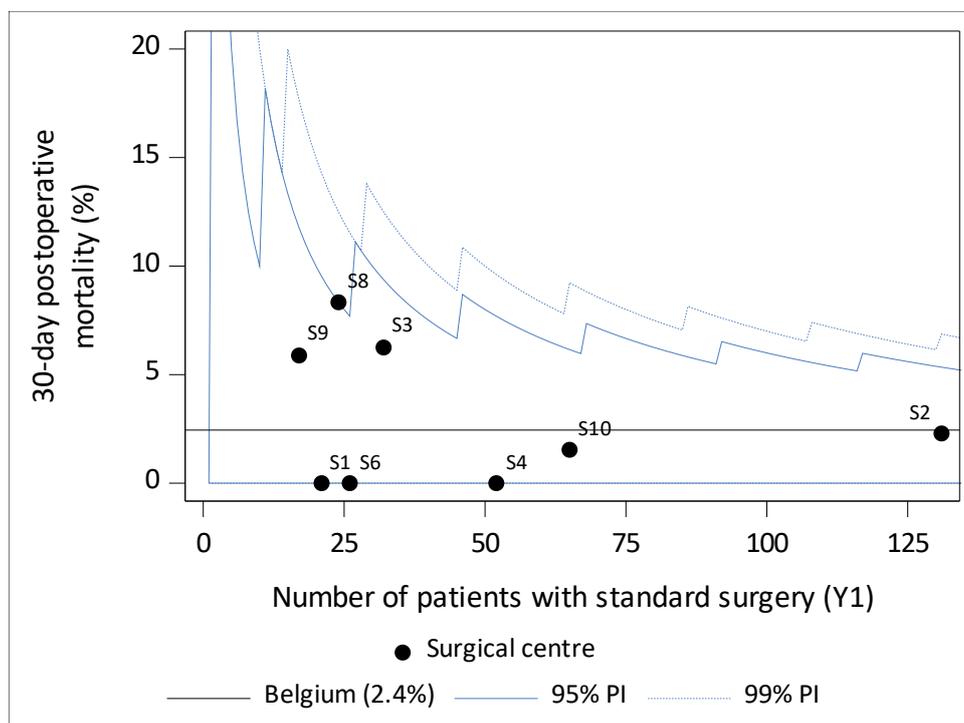
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

* Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients. Combinations of prior surgery, endoscopic treatment and neoadjuvant treatments could also occur.

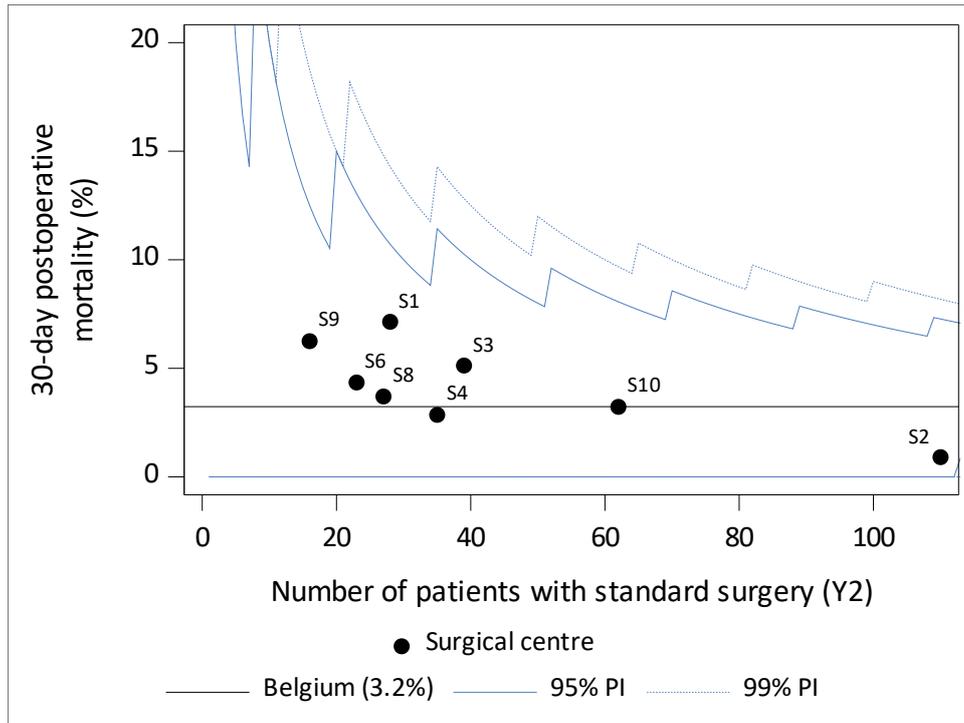
Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

Figure 11: Funnel and spaghetti plot of the unadjusted 30-day postoperative mortality (**only for standard surgery**), by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) all years combined, (g) evolution year 1, 2, 3, 4 and 5.

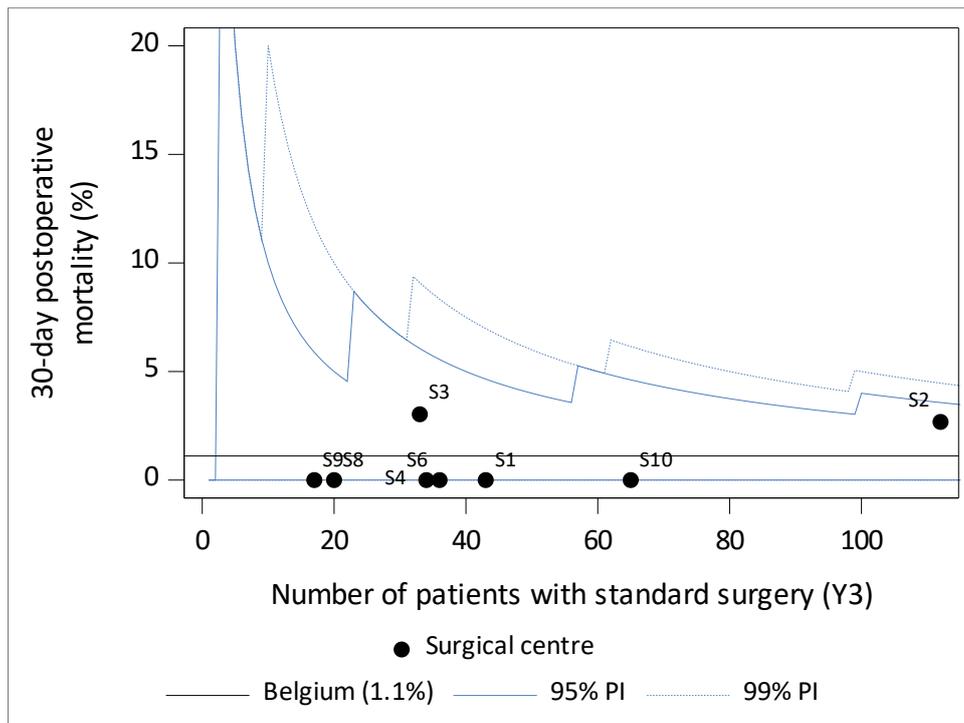
(a)



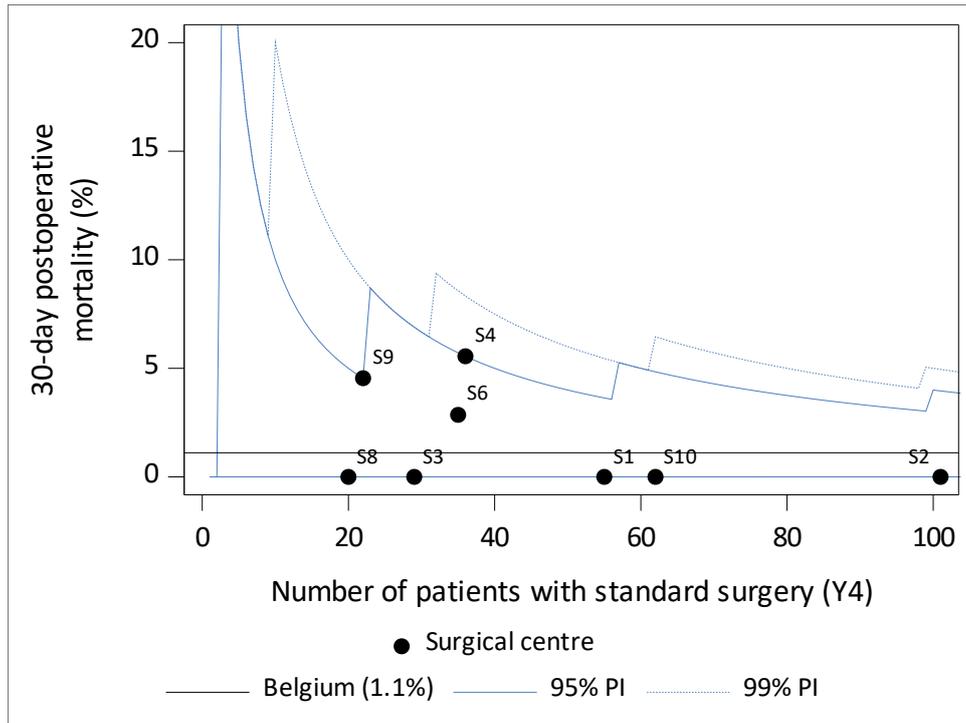
(b)



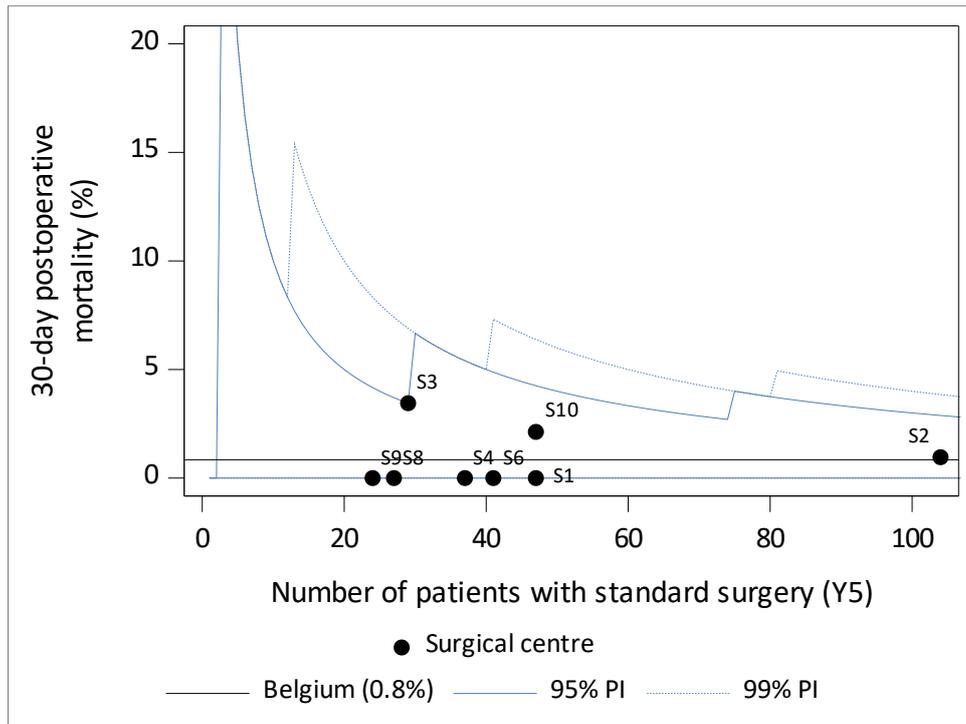
(c)



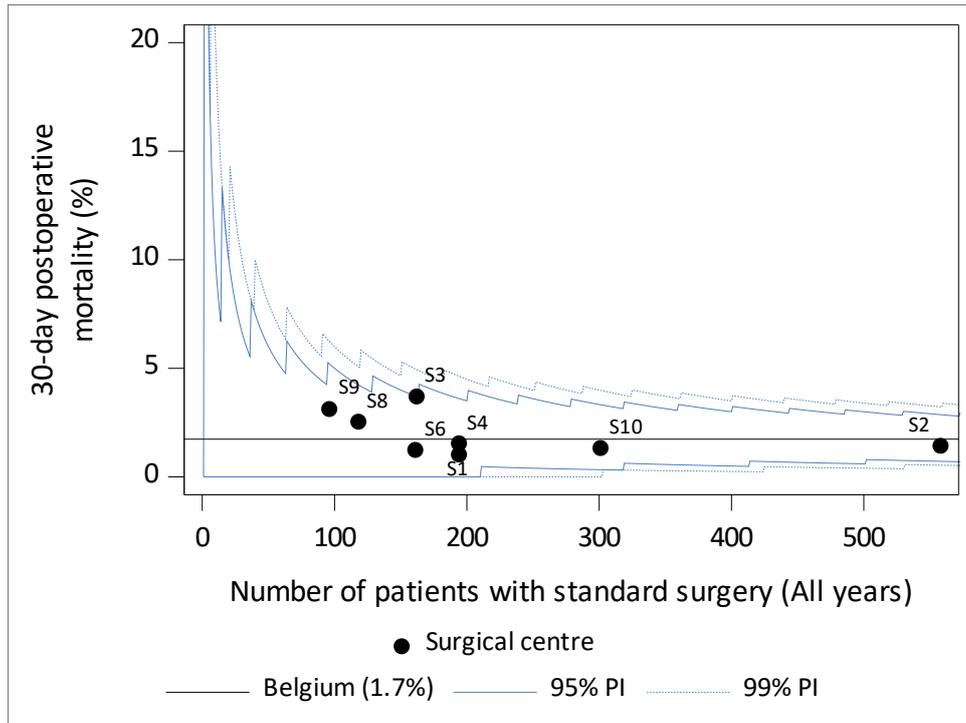
(d)



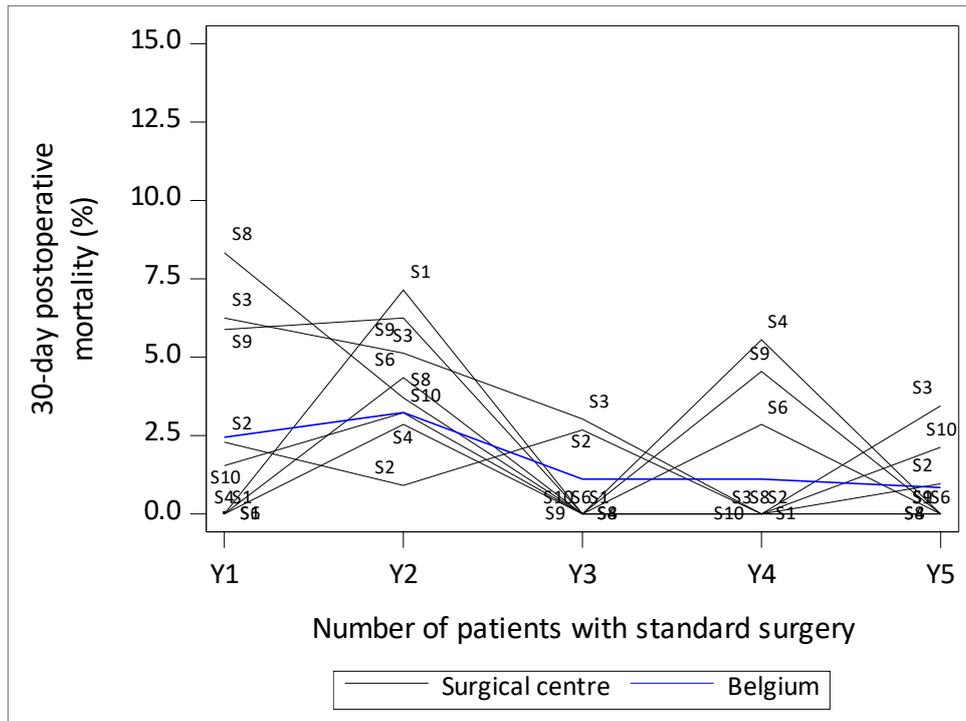
(e)



(f)



(g)



3.3.1.2 Adjusted 30-day postoperative mortality

Table 13: Case-mix adjusted odds ratio for postoperative mortality within 30 days and direct standardised 30-day postoperative mortality, for the **standard surgery only** in the five convention years.

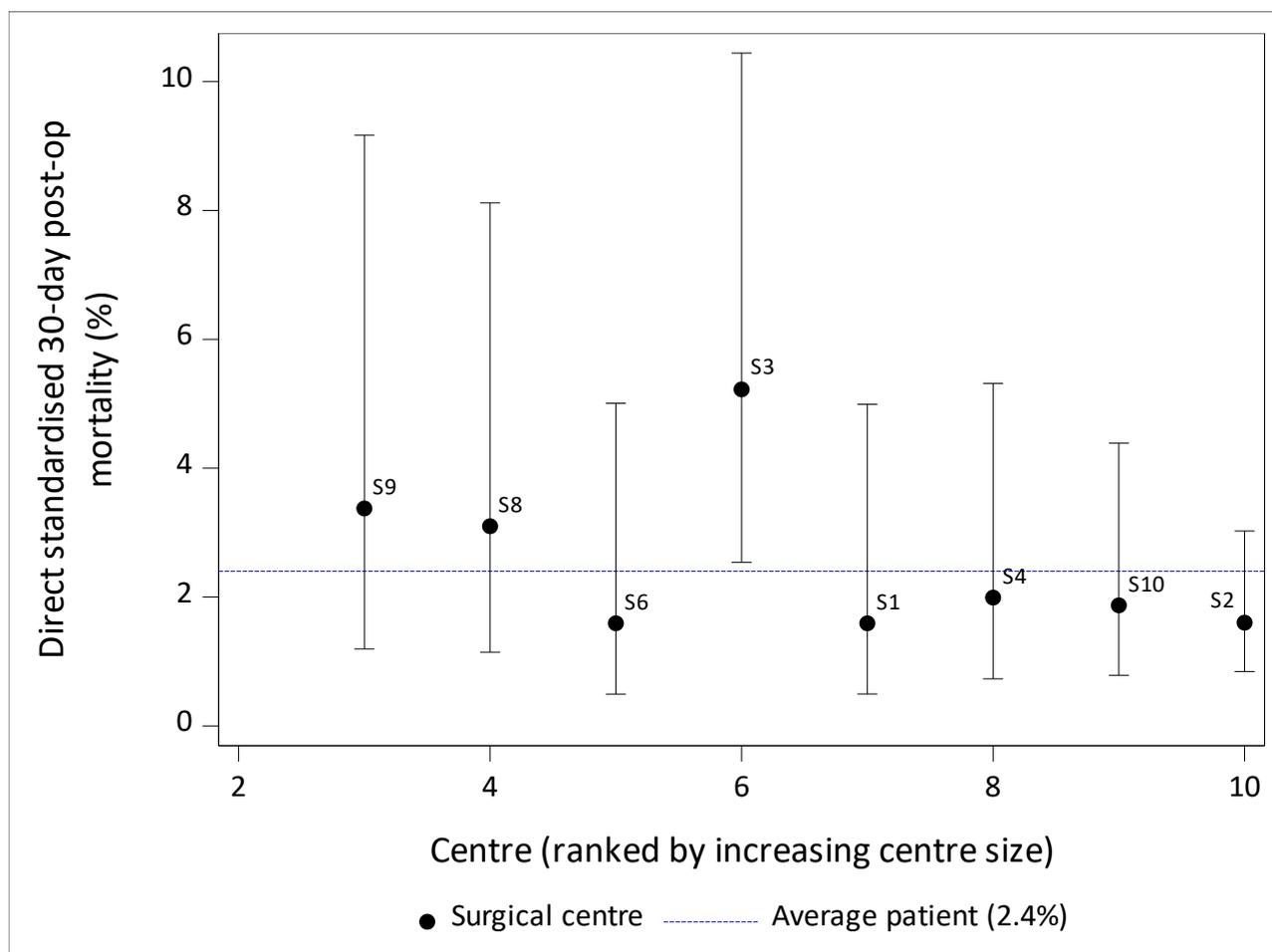
Expert centres	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	0.60	[0.19, 1.82]	0.81	1.6	[0.5, 5.0]	2.4
S2	0.60	[0.30, 1.19]	0.81	1.6	[0.8, 3.0]	2.4
S3	2.09	[0.96, 4.54]	0.81	5.2	[2.5, 10.4]	2.4
S4	0.75	[0.28, 2.01]	0.81	2.0	[0.7, 5.3]	2.4
S5	0.77	[0.18, 3.31]	0.81	2.0	[0.4, 9.0]	2.4
S6	0.60	[0.19, 1.83]	0.81	1.6	[0.5, 5.0]	2.4
S7	3.57	[1.41, 9.07]	0.81	8.4	[3.6, 18.6]	2.4
S8	1.19	[0.44, 3.20]	0.81	3.1	[1.1, 8.1]	2.4
S9	1.30	[0.46, 3.68]	0.81	3.4	[1.2, 9.2]	2.4
S10	0.70	[0.30, 1.67]	0.81	1.9	[0.8, 4.4]	2.4

Adjusted for surgery intention, primary tumour location, Charlson Comorbidity Index and clinical stage (as proposed by Audit Belgian Esophageal Surgery). S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the reference values (BE, average patient).

This table shows the case-mix adjusted odds ratio for postoperative mortality within 30 days and the center specific direct standardised 30-day mortality (%), together with their accompanying 95% confidence intervals. The 'average patient' odds ratio is obtained as a weighted average of the individual centre results with the fraction of patients per centre as weights. The 'average patient' results for the case-mix adjusted odds ratio and the direct standardised 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 12: Direct standardised 30-day postoperative mortality for **standard surgery only** in the five convention years, by surgical centre.



3.3.1.3 Unadjusted 90-day postoperative mortality

Table 14: Unadjusted 90-day postoperative mortality in the five convention years, by mode of surgery and by age for the total malignant population.

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Patients with surgery	2,000	117	5.9	[4.9, 7.0]
Expert centres				.
S1	202	10	5.0	[2.4, 8.9]
S2	579	26	4.5	[3.0, 6.5]
S3	167	11	6.6	[3.3, 11.5]
S4	207	16	7.7	[4.5, 12.2]
S5	66	3	4.5	[0.9, 12.7]
S6	166	6	3.6	[1.3, 7.7]
S7	61	14	23.0	[13.2, 35.5]
S8	125	7	5.6	[2.3, 11.2]
S9	96	5	5.2	[1.7, 11.7]
S10	331	19	5.7	[3.5, 8.8]
Convention year				
Year 1	418	27	6.5	[4.3, 9.3]
Year 2	404	44	10.9	[8.0, 14.3]
Year 3	420	17	4.0	[2.4, 6.4]
Year 4	387	14	3.6	[2.0, 6.0]
Year 5	371	15	4.0	[2.3, 6.6]
Mode of surgery				
Standard surgery	1,908	101	5.3	[4.3, 6.4]
Non-standard surgery	92	16	17.4	[10.3, 26.7]
Age at surgery				
<=69	1,226	47	3.8	[2.8, 5.1]
70-79	662	55	8.3	[6.3, 10.7]
>=80	112	15	13.4	[7.7, 21.1]

Non-standard surgery = emergency, palliative, recurrence, total laryngectomy
 S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

Table 15: Unadjusted 90-day postoperative mortality in the five convention years, by patient and tumour characteristics for the **standard surgery**.

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
Patients with standard surgery	1,908	101	5.3	[4.3, 6.4]
Expert centres				
S1	194	7	3.6	[1.5, 7.3]
S2	558	23	4.1	[2.6, 6.1]
S3	162	11	6.8	[3.4, 11.8]
S4	194	12	6.2	[3.2, 10.6]
S5	64	3	4.7	[1.0, 13.1]
S6	161	5	3.1	[1.0, 7.1]
S7	60	13	21.7	[12.1, 34.2]
S8	118	7	5.9	[2.4, 11.8]
S9	96	5	5.2	[1.7, 11.7]
S10	301	15	5.0	[2.8, 8.1]
Convention year				
Year 1	395	23	5.8	[3.7, 8.6]
Year 2	380	37	9.7	[6.9, 13.2]
Year 3	408	17	4.2	[2.4, 6.6]
Year 4	369	12	3.3	[1.7, 5.6]
Year 5	356	12	3.4	[1.8, 5.8]
Sex				
Male	1,515	85	5.6	[4.5, 6.9]
Female	393	16	4.1	[2.3, 6.5]
Age at surgery				
<=69	1,164	38	3.3	[2.3, 4.5]
70-79	635	49	7.7	[5.8, 10.1]
>=80	109	14	12.8	[7.2, 20.6]
Lesion to treat (in oesophagus/GOJ)				
Primary tumour	1,863	99	5.3	[4.3, 6.4]
Relapse of primary tumour	41	2	4.9	[0.6, 16.5]
Metastasis	4	0	0.0	[0.0, 60.2]
Morphology				
Adenocarcinoma	1,429	70	4.9	[3.8, 6.1]
Squamous cell carcinoma	444	30	6.8	[4.6, 9.5]
Other, unspecified or missing	35	1	2.9	[0.1, 14.9]
Primary tumour localisation				
C15.0/C15.3 Cervical/upper third oesophagus	49	6	12.2	[4.6, 24.8]
C15.1/C15.4 Thoracic/middle third oesophagus	246	17	6.9	[4.1, 10.8]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N	N of deaths	%	95% CI
C15.2/C15.5 Abdominal/lower third oesophagus	919	51	5.5	[4.2, 7.2]
C15.8 Overlapping lesion of oesophagus	11	0	0.0	[0.0, 28.5]
C15.9 Oesophagus, NOS	1	0	0.0	[0.0, 97.5]
C16.0 Gastro-oesophageal junction	677	27	4.0	[2.6, 5.7]
Other	5	0	0.0	[0.0, 52.2]
Clinical stage				
0	16	0	0.0	[0.0, 20.6]
I	170	11	6.5	[3.3, 11.3]
II	354	20	5.6	[3.5, 8.6]
III	935	52	5.6	[4.2, 7.2]
IV	333	15	4.5	[2.5, 7.3]
IVA [#]	266	12	4.5	[2.4, 7.7]
IVB [#]	63	2	3.2	[0.4, 11.0]
X	48	2	4.2	[0.5, 14.3]
TNM not applicable or relapse	52	1	1.9	[0.0, 10.3]
Prior surgery or endoscopic treatment *				
Prior major thoracic or abdominal surgery	161	10	6.2	[3.0, 11.1]
Endoscopic treatment	102	3	2.9	[0.6, 8.4]
- EMR/ESD	102	3	2.9	[0.6, 8.4]
- RFA	4	0	0.0	[0.0, 60.2]
- Ablation techniques other than RFA	0			–
Other treatment modality (that could affect the oesophagus)	31	2	6.5	[0.8, 21.4]
Neoadjuvant treatment				
Chemotherapy	521	16	3.1	[1.8, 4.9]
Targeted therapy/biologicals	21	2	9.5	[1.2, 30.4]
Radiotherapy	1	1	100.0	[2.5, 100.0]
Chemoradiotherapy	977	57	5.8	[4.4, 7.5]
No chemo, radiation or targeted treatment	408	27	6.6	[4.4, 9.5]
Charlson Comorbidity Index				
0	796	27	3.4	[2.2, 4.9]
1	505	27	5.3	[3.6, 7.7]
2	308	23	7.5	[4.8, 11.0]
3	166	10	6.0	[2.9, 10.8]
4	68	4	5.9	[1.6, 14.4]
5	26	3	11.5	[2.4, 30.2]
6	17	3	17.6	[3.8, 43.4]
7	14	1	7.1	[0.2, 33.9]
8	5	1	20.0	[0.5, 71.6]
9	3	2	66.7	[9.4, 99.2]

Characteristic	Unadjusted 90-day postoperative mortality			
	Belgium			
	N	N of deaths	%	95% CI
WHO score at surgery				
0 - Asymptomatic, normal activity	510	13	2.5	[1.4, 4.3]
1 - Symptomatic, but ambulant	1,142	63	5.5	[4.3, 7.0]
2 - Symptomatic, bedbound < 50% day	209	21	10.0	[6.3, 14.9]
3 - Symptomatic, bedbound > 50% day	42	3	7.1	[1.5, 19.5]
4 - Completely dependent, 100% bedbound	5	1	20.0	[0.5, 71.6]
ASA score				
1 - Healthy person	64	1	1.6	[0.0, 8.4]
2 - Mild systemic disease, normal activity	799	31	3.9	[2.7, 5.5]
3 - Serious systemic disease, limited activity	1,021	69	6.8	[5.3, 8.5]
4 - Life-threatening illness, handicapped	24	0	0.0	[0.0, 14.2]
Surgery intention				
Surgery as primary treatment	405	26	6.4	[4.2, 9.3]
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1,434	70	4.9	[3.8, 6.1]
Salvage post-radical chemo- and/or radiotherapy	69	5	7.2	[2.4, 16.1]
Type of surgery				
Minimally invasive surgery (MIS)	1,262	67	5.3	[4.1, 6.7]
Open	616	30	4.9	[3.3, 6.9]
Conversion from MIS to open surgery	30	4	13.3	[3.8, 30.7]
RIZIV code for complex surgery				
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	5	0	0.0	[0.0, 52.2]
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	2	1	50.0	[1.3, 98.7]
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	558	27	4.8	[3.2, 7.0]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	1,343	73	5.4	[4.3, 6.8]
Oesophagectomy				
Partial	733	42	5.7	[4.2, 7.7]
Subtotal	1,175	59	5.0	[3.8, 6.4]
Antithrombotic medication				
No	1,538	69	4.5	[3.5, 5.6]
Yes	370	32	8.6	[6.0, 12.0]
Was the patient referred?				
No	428	29	6.8	[4.6, 9.6]
Yes	1,480	72	4.9	[3.8, 6.1]

Unadjusted 90-day postoperative mortality				
Belgium				
Characteristic	N of		%	95% CI
	N	deaths		

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

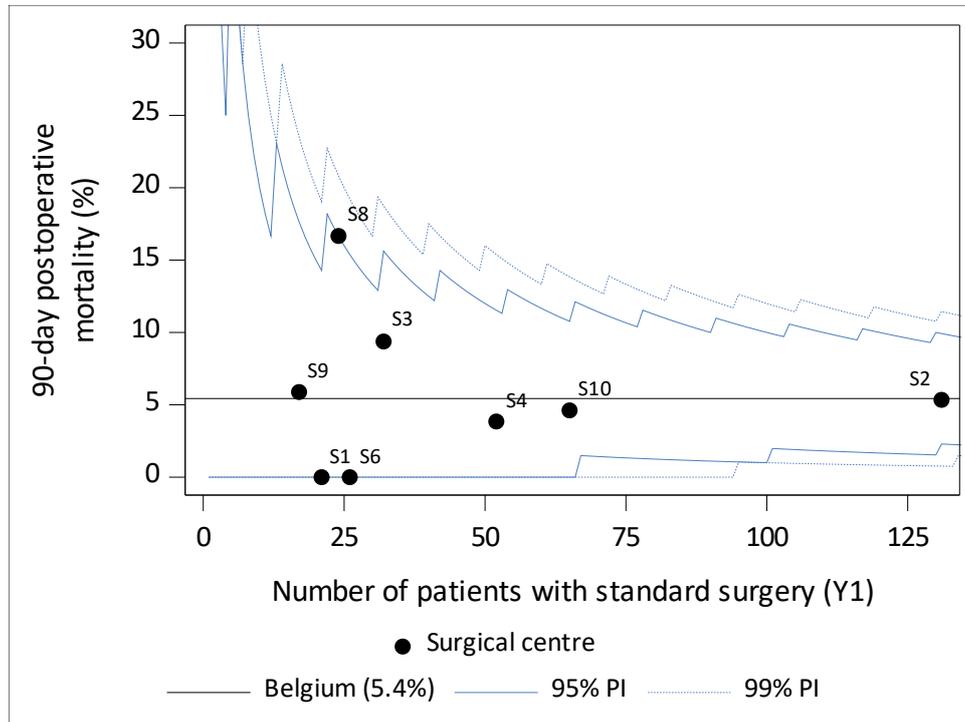
S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

* Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients. Combinations of prior surgery, endoscopic treatment and neoadjuvant treatments could also occur.

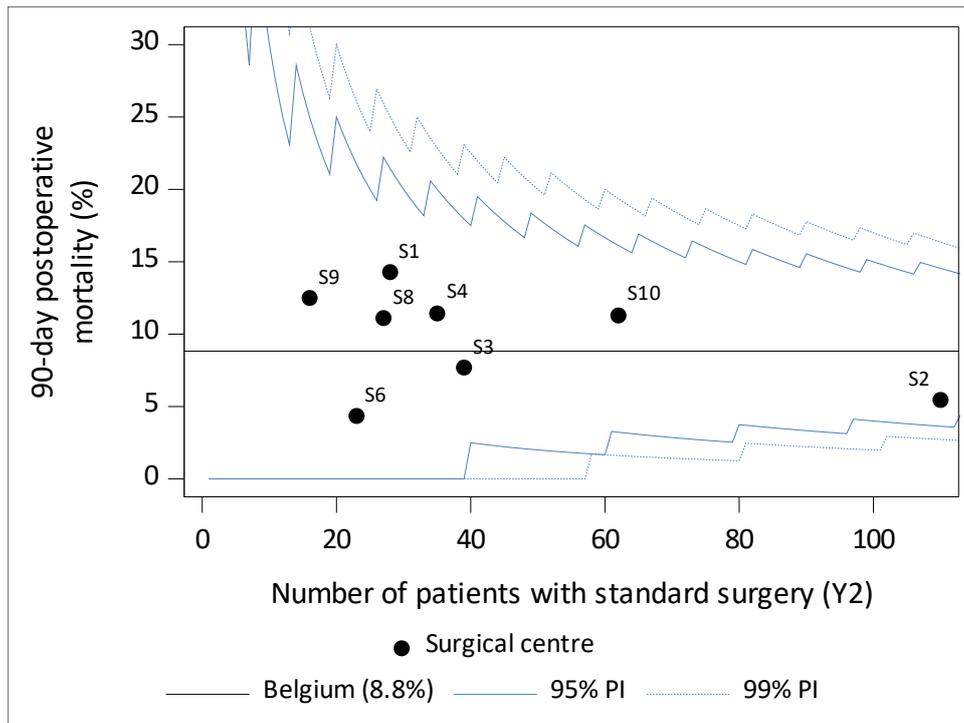
Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

Figure 13: Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality (**only for standard surgery**), by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5, (f) all years combined, (g) evolution year 1, 2, 3, 4 and 5.

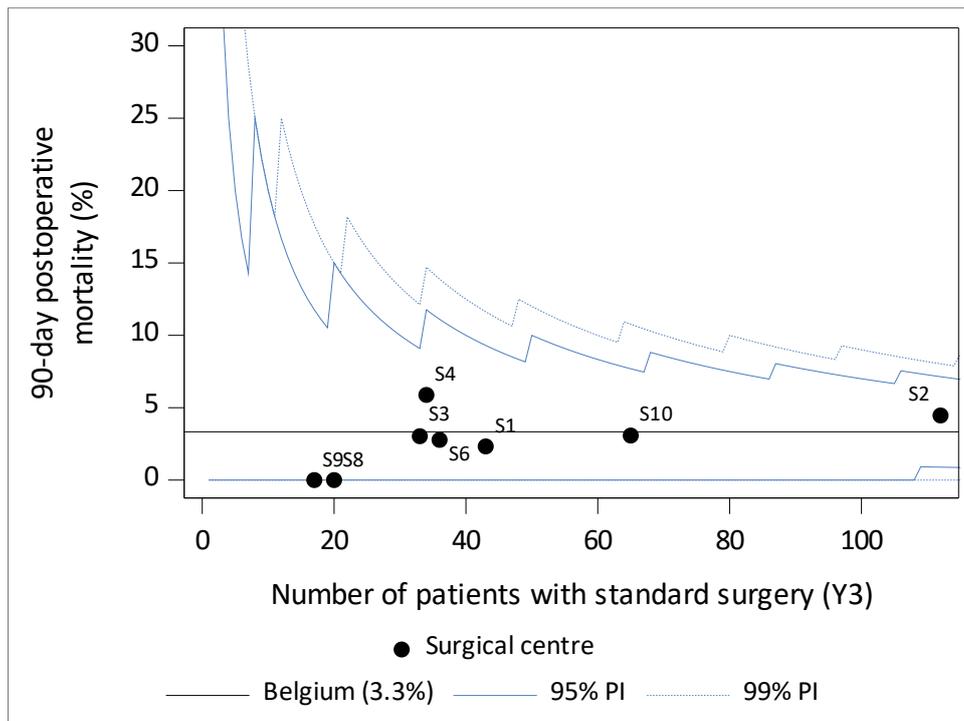
(a)



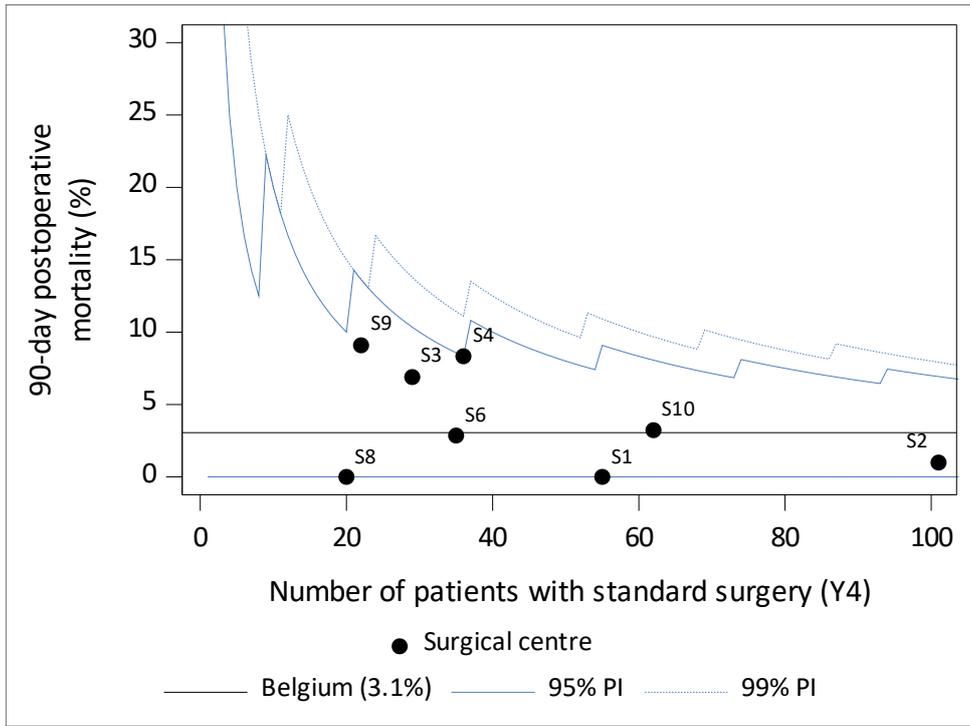
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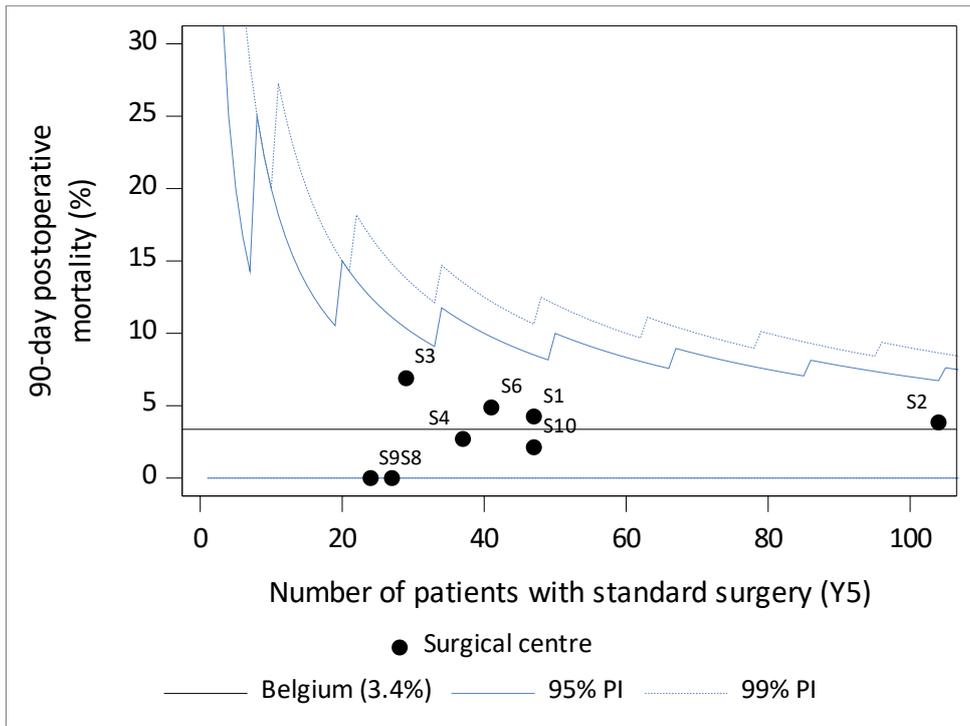
(c)



(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 the **standard surgery only** in the five convention years.

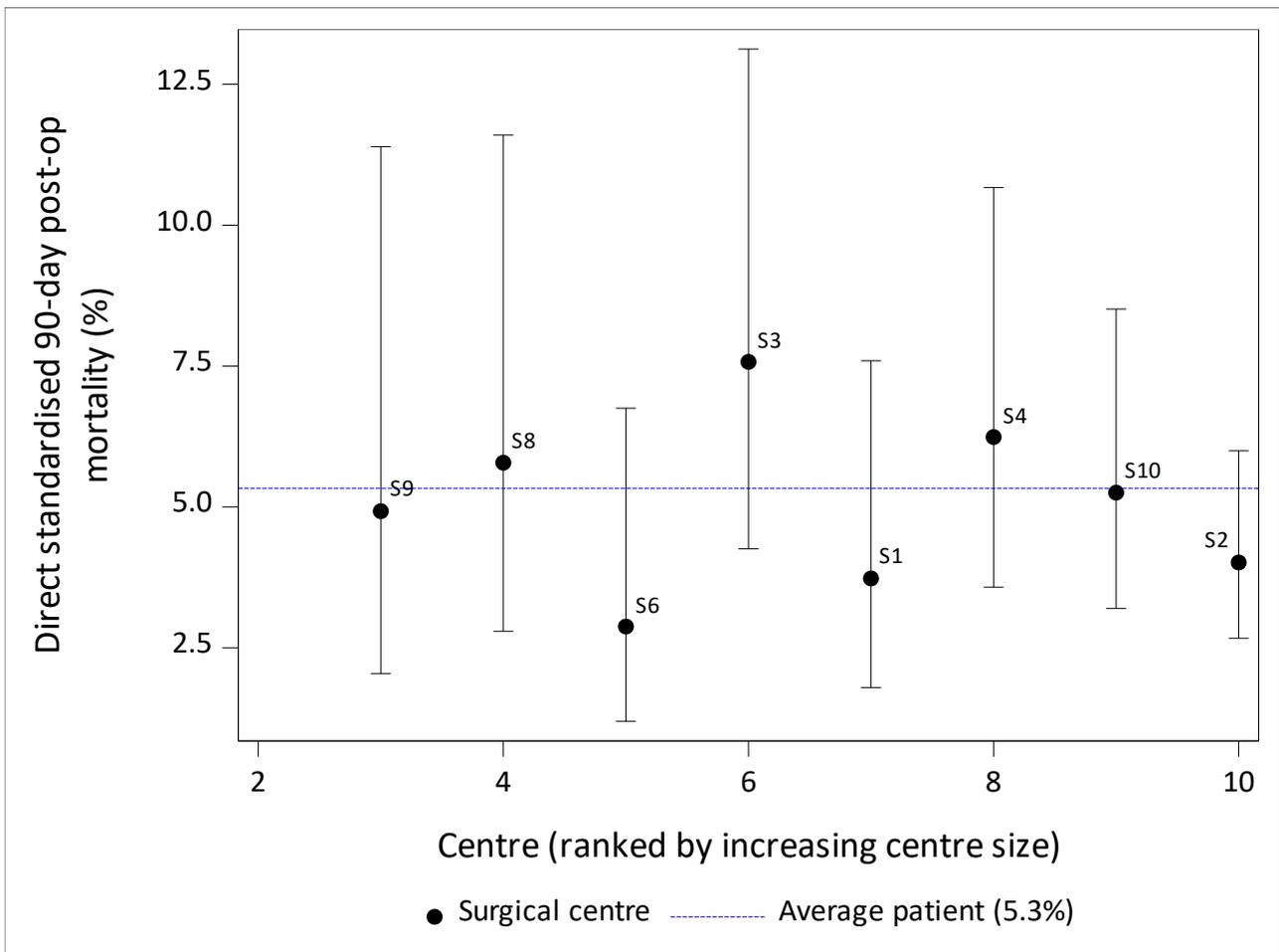
Expert centres	Adjusted Odds Ratio			Standardised probability (%)		
	Estimate	95% CI	Average patient	Estimate	95% CI	Average patient
S1	0.64	[0.31, 1.33]	0.86	3.7	[1.8, 7.6]	5.3
S2	0.70	[0.44, 1.10]	0.86	4.0	[2.7, 6.0]	5.3
S3	1.38	[0.75, 2.54]	0.86	7.6	[4.3, 13.1]	5.3
S4	1.12	[0.62, 2.00]	0.86	6.2	[3.6, 10.7]	5.3
S5	0.74	[0.25, 2.18]	0.86	4.3	[1.4, 12.4]	5.3
S6	0.49	[0.21, 1.14]	0.86	2.9	[1.2, 6.8]	5.3
S7	4.84	[2.61, 8.94]	0.86	21.5	[13.1, 33.3]	5.3
S8	1.03	[0.49, 2.14]	0.86	5.8	[2.8, 11.6]	5.3
S9	0.86	[0.36, 2.05]	0.86	4.9	[2.0, 11.4]	5.3
S10	0.93	[0.55, 1.57]	0.86	5.3	[3.2, 8.5]	5.3

Adjusted for surgery intention, primary tumour location, Charlson Comorbidity Index and clinical stage (as proposed by Audit Belgian Esophageal Surgery). S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the reference values (BE, average patient).

This table shows the case-mix adjusted odds ratio for postoperative mortality within 90 days and the center specific direct standardised 90-day mortality (%), together with their accompanying 95% confidence intervals. The 'average patient' odds ratio is obtained as a weighted average of the individual centre results with the fraction of patients per centre as weights. The 'average patient' results for the case-mix adjusted odds ratio and the direct standardised 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 14: Direct standardised 90-day postoperative mortality for **standard surgery only** in the five convention years, by surgical centre.



3.3.2. Survival

Survival indicator 5 years after surgery cannot yet be calculated since there is only a limited number of patients with a 5-year follow-up after surgery at the time the report was made.

The vital status used in these analyses was determined on the 30th of October 2024.

3.3.2.1 Unadjusted observed survival after surgery (all causes of death)

Table 17: Number of deaths, total person years and hazard during the first year interval after surgery, in the five convention years.

Characteristic	Belgium				
	N	N of deaths	Person Years	hazard	95% CI
Patients with surgery	2,000	365	1,708	0.21	[0.19, 0.24]
Expert centres					
S1	202	36	170	0.21	[0.15, 0.29]
S2	579	108	505	0.21	[0.18, 0.26]
S3	167	26	142	0.18	[0.12, 0.27]
S4	207	43	172	0.25	[0.18, 0.34]
S5	66	9	61	0.15	[0.07, 0.28]
S6	166	26	142	0.18	[0.12, 0.27]
S7	61	22	47	0.47	[0.30, 0.71]
S8	125	21	107	0.20	[0.12, 0.30]
S9	96	14	82	0.17	[0.09, 0.29]
S10	331	60	281	0.21	[0.16, 0.27]
Convention year					
Year 1	418	80	371	0.22	[0.17, 0.27]
Year 2	404	100	341	0.29	[0.24, 0.36]
Year 3	420	73	386	0.19	[0.15, 0.24]
Year 4	387	63	351	0.18	[0.14, 0.23]
Year 5	371	49	258	0.19	[0.14, 0.25]
Mode of surgery					
Standard surgery	1,908	330	1,642	0.20	[0.18, 0.22]
Non-standard surgery	92	35	66	0.53	[0.37, 0.74]
Age at surgery					
<=69	1,226	194	1,075	0.18	[0.16, 0.21]
70-79	662	142	543	0.26	[0.22, 0.31]
>=80	112	29	90	0.32	[0.22, 0.47]

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

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

Expert Centres	1-year observed survival after surgery, %																	
	Year 1			Year 2			Year 3			Year 4			Year 5			All years		
	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI
S1	21	NA*	NA*	28	NA*	NA*	43	83.7	[68.9, 91.9]	55	81.8	[68.8, 89.8]	47	84.1	[66.3, 92.9]	194	82.6	[76.3, 87.4]
S2	131	82.3	[74.6, 87.9]	110	75.5	[66.3, 82.5]	112	85.7	[77.7, 91.0]	101	86.0	[77.5, 91.5]	104	79.5	[69.1, 86.7]	558	81.6	[78.0, 84.7]
S3	32	NA*	NA*	39	NA*	NA*	33	NA*	NA*	29	NA*	NA*	29	NA*	NA*	162	84.3	[77.5, 89.2]
S4	52	92.3	[80.8, 97.0]	35	NA*	NA*	34	NA*	NA*	36	NA*	NA*	37	NA*	NA*	194	79.9	[73.3, 85.0]
S5	14	NA*	NA*	20	NA*	NA*	25	NA*	NA*	5	NA*	NA*	0	NA*	NA*	64	85.7	[74.3, 92.3]
S6	26	NA*	NA*	23	NA*	NA*	36	NA*	NA*	35	NA*	NA*	41	92.7	[79.0, 97.6]	161	83.6	[76.7, 88.6]
S7	13	NA*	NA*	20	NA*	NA*	23	NA*	NA*	4	NA*	NA*	0	NA*	NA*	60	65.0	[51.5, 75.6]
S8	24	NA*	NA*	27	NA*	NA*	20	NA*	NA*	20	NA*	NA*	27	NA*	NA*	118	82.5	[74.2, 88.4]
S9	17	NA*	NA*	16	NA*	NA*	17	NA*	NA*	22	NA*	NA*	24	NA*	NA*	96	84.4	[75.1, 90.5]
S10	65	80.0	[68.1, 87.9]	62	71.0	[58.0, 80.6]	65	87.7	[76.9, 93.6]	62	88.7	[77.8, 94.5]	47	89.9	[74.8, 96.2]	301	82.8	[77.9, 86.7]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result per year (BE).

*N<40

Table 19: Unadjusted observed 3-year survival after surgery, death by all causes, per individual expert centre, **standard surgery only**.

Expert Centres	3-year observed survival after surgery, %																	
	Year 1			Year 2			Year 3			Year 4			Year 5			All years		
	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI	N	Estimate	95% CI
S1	21	NA*	NA*	28	NA*	NA*	43	60.6	[43.5, 74.0]	55	NA**	NA**	47	NA**	NA**	194	55.8	[46.4, 64.2]
S2	131	55.9	[46.9, 64.0]	110	58.1	[48.4, 66.7]	112	68.5	[59.0, 76.3]	101	NA**	NA**	104	NA**	NA**	558	59.1	[54.3, 63.7]
S3	32	NA*	NA*	39	NA*	NA*	33	NA*	NA*	29	NA**	NA**	29	NA**	NA**	162	61.1	[51.6, 69.2]
S4	52	63.5	[48.9, 74.9]	35	NA*	NA*	34	NA*	NA*	36	NA**	NA**	37	NA**	NA**	194	52.4	[44.0, 60.2]
S5	14	NA*	NA*	20	NA*	NA*	25	NA*	NA*	5	NA**	NA**	0	NA*	NA*	64	60.0	[46.2, 71.3]
S6	26	NA*	NA*	23	NA*	NA*	36	NA*	NA*	35	NA**	NA**	41	NA**	NA**	161	58.1	[47.7, 67.1]
S7	13	NA*	NA*	20	NA*	NA*	23	NA*	NA*	4	NA**	NA**	0	NA*	NA*	60	43.1	[30.4, 55.2]
S8	24	NA*	NA*	27	NA*	NA*	20	NA*	NA*	20	NA**	NA**	27	NA**	NA**	118	63.0	[51.7, 72.4]
S9	17	NA*	NA*	16	NA*	NA*	17	NA*	NA*	22	NA**	NA**	24	NA**	NA**	96	63.4	[50.5, 73.7]
S10	65	55.4	[42.5, 66.5]	62	50.0	[37.1, 61.6]	65	68.6	[54.7, 79.0]	62	NA**	NA**	47	NA**	NA**	301	60.9	[54.1, 66.9]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result per year (BE).

*N<40

** 3-year follow-up after surgery is not reached

Table 20: Unadjusted observed 1-year survival after surgery, death by all causes, in the five convention years, **standard surgery only**.

Characteristic	1-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
Patients with standard surgery	1908	81.9	[80.1, 83.6]
Convention year			
Year 1	395	82.0	[77.8, 85.4]
Year 2	380	76.5	[71.9, 80.5]
Year 3	408	83.0	[79.0, 86.4]
Year 4	369	83.7	[79.5, 87.1]
Year 5	356	86.0	[81.2, 89.6]
Sex			
Male	1515	81.0	[78.9, 82.9]
Female	393	85.4	[81.5, 88.6]
Age at surgery			
<=69	1164	84.5	[82.3, 86.5]
70-79	635	78.6	[75.1, 81.6]
>=80	109	73.2	[63.5, 80.7]
Lesion to treat (in oesophagus/GOJ)			
Primary tumour	1863	82.1	[80.3, 83.8]
Relapse of primary tumour	41	72.2	[55.4, 83.5]
Metastasis	4	NA*	NA*
Morphology			
Adenocarcinoma	1429	82.2	[80.1, 84.2]
Squamous cell carcinoma	444	81.3	[77.3, 84.7]
Other, unspecified or missing	35	NA*	NA*
Primary tumour localisation			
C15.0/C15.3 Cervical/upper third oesophagus	49	79.3	[64.9, 88.3]
C15.1/C15.4 Thoracic/middle third oesophagus	246	79.9	[74.2, 84.5]
C15.2/C15.5 Abdominal/lower third oesophagus	919	82.3	[79.7, 84.7]
C15.8 Overlapping lesion of oesophagus	11	NA*	NA*
C15.9 Oesophagus, NOS	1	NA*	NA*
C16.0 Gastro-oesophageal junction	677	82.2	[79.0, 85.0]
Other	5	NA*	NA*
Clinical stage			
0	16	NA*	NA*
I	170	92.4	[87.2, 95.5]
II	354	87.8	[83.8, 90.8]
III	935	80.7	[77.9, 83.2]
IV	333	75.1	[69.9, 79.5]
IVA [#]	266	78.2	[72.6, 82.7]

Characteristic	1-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
IVB [#]	63	61.8	[47.8, 73.1]
X	48	74.2	[59.1, 84.5]
TNM not applicable or relapse	52	73.0	[58.0, 83.4]
Prior surgery or endoscopic treatment**			
Prior major thoracic or abdominal surgery	161	84.2	[77.4, 89.2]
Endoscopic treatment	102	93.9	[87.0, 97.2]
- EMR/ESD	102	93.9	[87.0, 97.2]
- RFA	4	NA*	NA*
- Ablation techniques other than RFA	0	NA*	NA*
Other treatment modality (that could affect the oesophagus)	31	NA*	NA*
Neoadjuvant treatment			
Chemotherapy	521	79.6	[75.7, 82.9]
Targeted therapy/biologicals	21	NA*	NA*
Radiotherapy	1	NA*	NA*
Chemoradiotherapy	977	80.0	[77.3, 82.4]
No chemo, radiation or targeted treatment	408	89.6	[86.2, 92.2]
Charlson Comorbidity Index			
0	796	85.5	[82.8, 87.8]
1	505	82.6	[78.9, 85.7]
2	308	78.5	[73.4, 82.8]
3	166	79.7	[72.5, 85.2]
4	68	71.8	[59.5, 81.0]
5	26	NA*	NA*
6	17	NA*	NA*
7	14	NA*	NA*
8	5	NA*	NA*
9	3	NA*	NA*
WHO score at surgery			
0 - Asymptomatic, normal activity	510	89.2	[86.1, 91.7]
1 - Symptomatic, but ambulant	1142	80.6	[78.1, 82.8]
2 - Symptomatic, bedbound < 50% day	209	73.4	[66.7, 78.9]
3 - Symptomatic, bedbound > 50% day	42	72.8	[56.1, 84.0]
4 - Completely dependent, 100% bedbound	5	NA*	NA*
ASA score			
1 - Healthy person	64	90.6	[80.3, 95.7]
2 - Mild systemic disease, normal activity	799	84.5	[81.8, 86.9]
3 - Serious systemic disease, limited activity	1021	79.6	[76.9, 82.0]
4 - Life-threatening illness, handicapped	24	NA*	NA*
Surgery intention			
Surgery as primary treatment	405	89.2	[85.8, 91.9]

Characteristic	1-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1434	80.7	[78.5, 82.7]
Salvage post-radical chemo- and/or radiotherapy	69	62.7	[49.9, 73.0]
Mode of surgery			
Elective	1908	81.9	[80.1, 83.6]
Type of surgery			
Minimally invasive surgery (MIS)	1262	83.7	[81.5, 85.7]
Open	616	78.5	[74.9, 81.6]
Conversion from MIS to open surgery	30	NA*	NA*
RIZIV code for complex surgery			
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	5	NA*	NA*
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	2	NA*	NA*
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	558	78.4	[74.6, 81.6]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	1343	83.4	[81.2, 85.3]
Oesophagectomy			
Partial	733	79.0	[75.8, 81.8]
Subtotal	1175	83.8	[81.5, 85.8]
Antithrombotic medication			
No	1538	82.7	[80.7, 84.6]
Yes	370	78.5	[73.9, 82.4]
Was the patient referred?			
No	428	80.8	[76.7, 84.3]
Yes	1480	82.2	[80.1, 84.1]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

*N<40

**Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients. Combinations of prior surgery, endoscopic treatment and neoadjuvant treatments could also occur.

Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

Table 21: Unadjusted observed 3-year survival after surgery, death by all causes, in the five convention years, **standard surgery only**.

Characteristic	3-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
Patients with standard surgery	1908	58.4	[55.8, 61.0]
Convention year			
Year 1	395	56.8	[51.7, 61.5]
Year 2	380	57.0	[51.8, 61.8]
Year 3	408	61.4	[56.3, 66.1]
Year 4	369	NA**	NA**
Year 5	356	NA**	NA**
Sex			
Male	1515	55.4	[52.4, 58.3]
Female	393	70.1	[64.5, 75.0]
Age at surgery			
<=69	1164	62.0	[58.6, 65.1]
70-79	635	54.8	[50.0, 59.3]
>=80	109	39.8	[28.5, 50.9]
Lesion to treat (in oesophagus/GOJ)			
Primary tumour	1863	58.7	[56.0, 61.3]
Relapse of primary tumour	41	43.5	[25.5, 60.3]
Metastasis	4	NA*	NA*
Morphology			
Adenocarcinoma	1429	58.4	[55.3, 61.3]
Squamous cell carcinoma	444	58.1	[52.5, 63.2]
Other, unspecified or missing	35	NA*	NA*
Primary tumour localisation			
C15.0/C15.3 Cervical/upper third oesophagus	49	55.4	[37.5, 70.1]
C15.1/C15.4 Thoracic/middle third oesophagus	246	60.4	[53.0, 66.9]
C15.2/C15.5 Abdominal/lower third oesophagus	919	57.7	[53.9, 61.3]
C15.8 Overlapping lesion of oesophagus	11	NA*	NA*
C15.9 Oesophagus, NOS	1	NA*	NA*
C16.0 Gastro-oesophageal junction	677	58.8	[54.2, 63.2]
Other	5	NA*	NA*
Clinical stage			
0	16	NA*	NA*
I	170	75.8	[67.5, 82.2]
II	354	72.9	[66.8, 78.0]
III	935	55.1	[51.3, 58.8]
IV	333	44.6	[38.3, 50.7]
IVA [#]	266	47.8	[40.8, 54.5]

Characteristic	3-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
IVB [#]	63	33.0	[19.8, 46.8]
X	48	47.5	[30.5, 62.7]
TNM not applicable or relapse	52	56.5	[39.9, 70.1]
Prior surgery or endoscopic treatment***			
Prior major thoracic or abdominal surgery	161	60.7	[50.8, 69.2]
Endoscopic treatment	102	78.8	[67.2, 86.7]
- EMR/ESD	102	78.8	[67.2, 86.7]
- RFA	4	NA*	NA*
- Ablation techniques other than RFA	0	NA*	NA*
Other treatment modality (that could affect the oesophagus)	31	NA*	NA*
Neoadjuvant treatment			
Chemotherapy	521	55.3	[50.0, 60.3]
Targeted therapy/biologicals	21	NA*	NA*
Radiotherapy	1	NA*	NA*
Chemoradiotherapy	977	55.2	[51.4, 58.7]
No chemo, radiation or targeted treatment	408	69.9	[64.4, 74.7]
Charlson Comorbidity Index			
0	796	61.6	[57.6, 65.5]
1	505	59.7	[54.5, 64.6]
2	308	54.0	[47.2, 60.4]
3	166	51.8	[42.4, 60.5]
4	68	57.5	[44.2, 68.8]
5	26	NA*	NA*
6	17	NA*	NA*
7	14	NA*	NA*
8	5	NA*	NA*
9	3	NA*	NA*
WHO score at surgery			
0 - Asymptomatic, normal activity	510	67.5	[62.3, 72.1]
1 - Symptomatic, but ambulant	1142	56.7	[53.3, 59.9]
2 - Symptomatic, bedbound < 50% day	209	49.7	[41.7, 57.2]
3 - Symptomatic, bedbound > 50% day	42	49.1	[29.4, 66.2]
4 - Completely dependent, 100% bedbound	5	NA*	NA*
ASA score			
1 - Healthy person	64	62.7	[48.3, 74.1]
2 - Mild systemic disease, normal activity	799	61.2	[57.1, 64.9]
3 - Serious systemic disease, limited activity	1021	56.1	[52.4, 59.7]
4 - Life-threatening illness, handicapped	24	NA*	NA*
Surgery intention			
Surgery as primary treatment	405	71.2	[65.7, 75.9]

Characteristic	3-year observed survival after surgery, %		
	Belgium		
	N	Estimate	95% CI
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1434	55.7	[52.6, 58.7]
Salvage post-radical chemo- and/or radiotherapy	69	36.5	[23.7, 49.3]
Mode of surgery			
Elective	1908	58.4	[55.8, 61.0]
Type of surgery			
Minimally invasive surgery (MIS)	1262	60.7	[57.4, 63.9]
Open	616	54.0	[49.5, 58.4]
Conversion from MIS to open surgery	30	NA*	NA*
RIZIV code for complex surgery			
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	5	NA*	NA*
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	2	NA*	NA*
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	558	57.5	[52.6, 62.0]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	1343	58.7	[55.5, 61.8]
Oesophagectomy			
Partial	733	58.1	[53.9, 62.0]
Subtotal	1175	58.5	[55.1, 61.8]
Antithrombotic medication			
No	1538	60.0	[57.1, 62.8]
Yes	370	51.6	[45.5, 57.5]
Was the patient referred?			
No	428	56.5	[50.8, 61.7]
Yes	1480	59.0	[56.0, 61.9]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

*N<40

** 3-year follow-up after surgery is not reached

***Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients. Combinations of prior surgery, endoscopic treatment and neoadjuvant treatments could also occur.

Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

Figure 15: Unadjusted observed 1-year survival after surgery, death by all causes, for all years combined, **standard surgery only**.

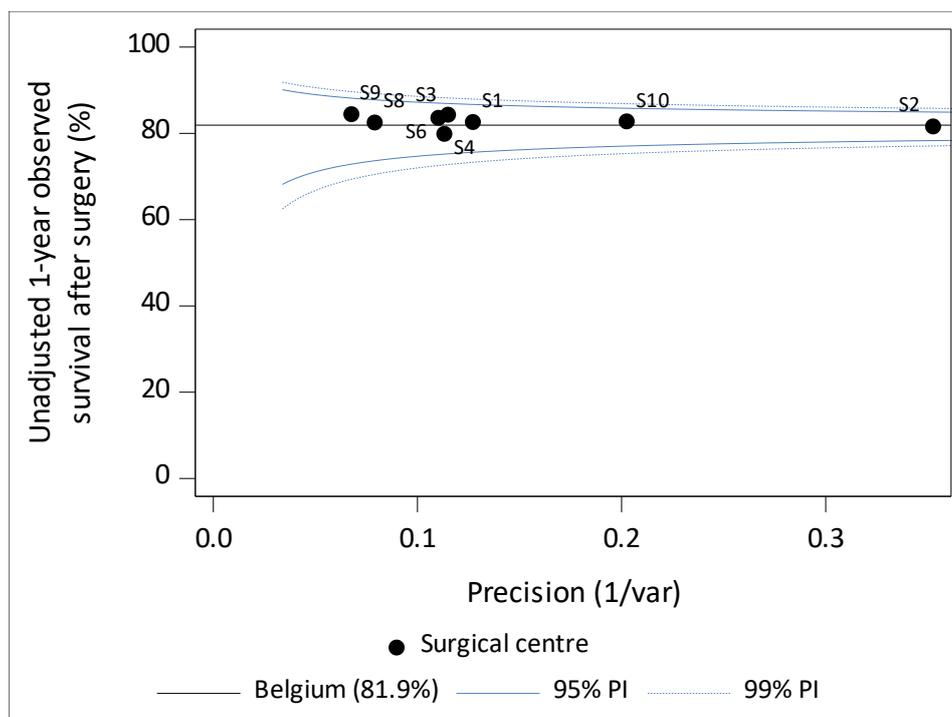
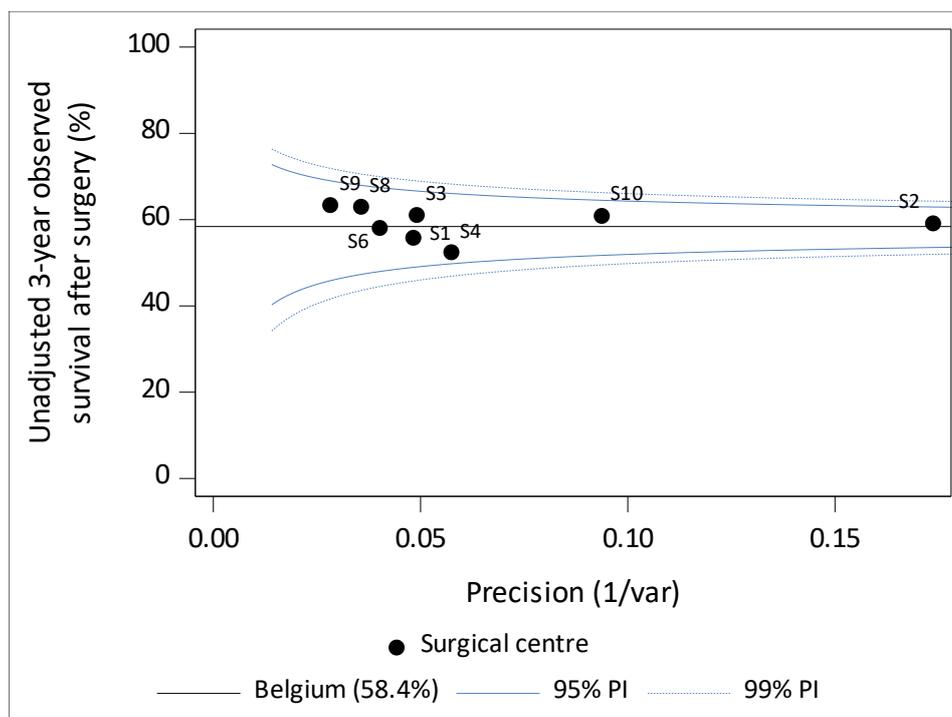


Figure 16: Unadjusted observed 3-year survival after surgery, death by all causes, for all years combined, **standard surgery only**.



3.3.3. Proportion of operated patients with a R0 resection

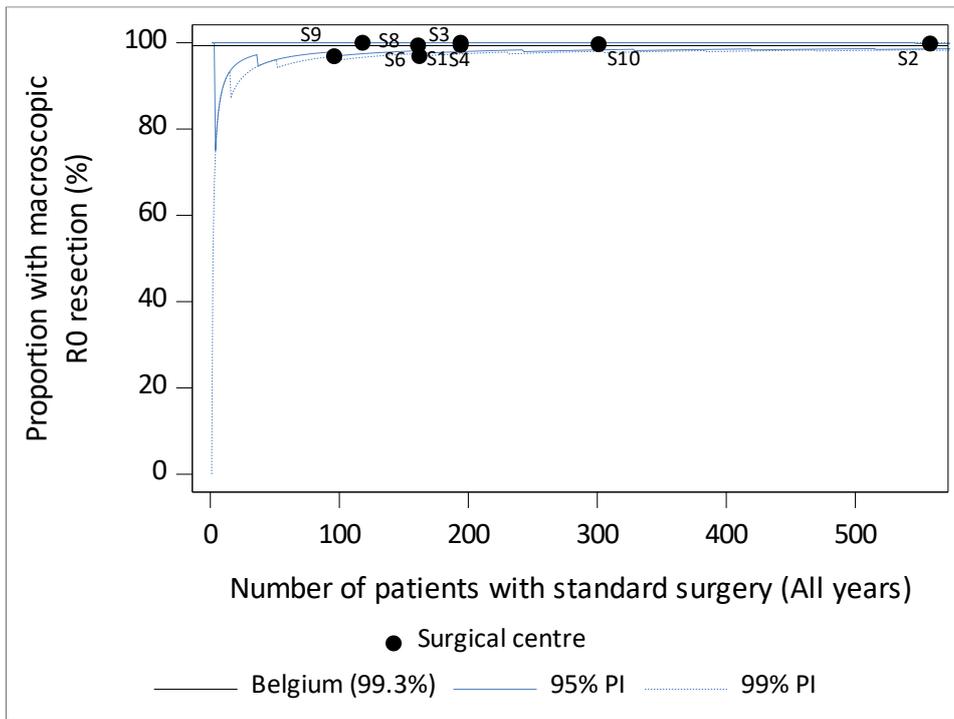
Table 22: Proportion of operated patients in the five convention years with a macroscopic R0 resection, a microscopic R0 resection and with involvement of the proximal margin (**only for standard surgery**).

	Belgium			
	N	n	n/N (%)	95% CI
<i>Macroscopic R0 resection</i>	1,908	1,894	99.3	[98.8, 99.6]
<i>Microscopic R0 resection</i>	1,908	1,810	94.9	[93.8, 95.8]
<i>Proximal margin involved</i>	1,908	21	1.1	[0.7, 1.7]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

Figure 17: Funnel and spaghetti plot of operated patients with a macroscopic R0 resection (**only for standard surgery**), per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

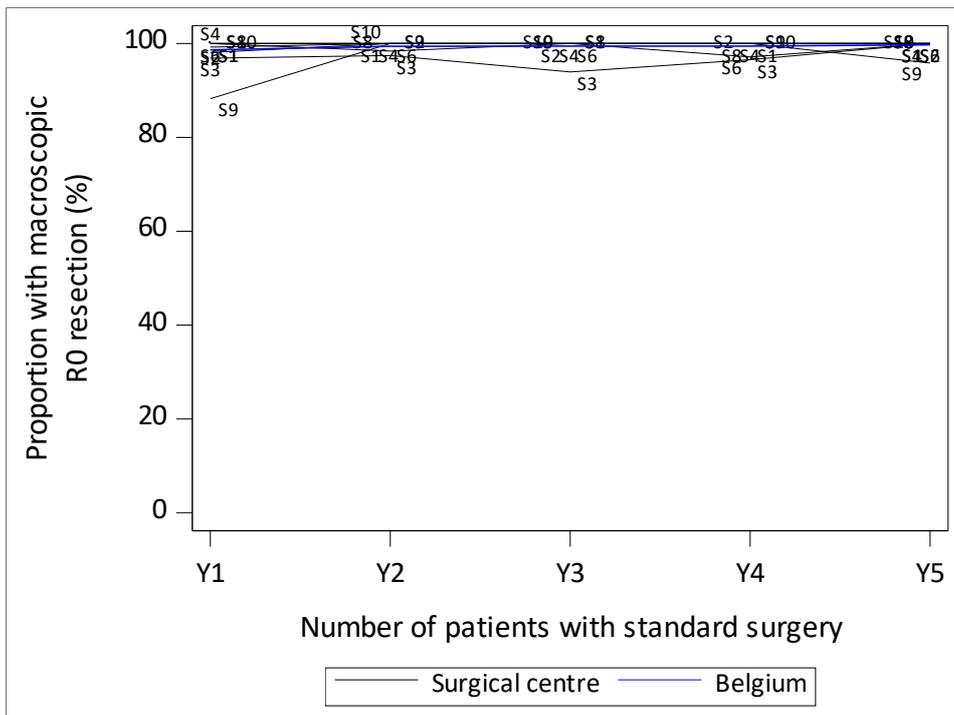
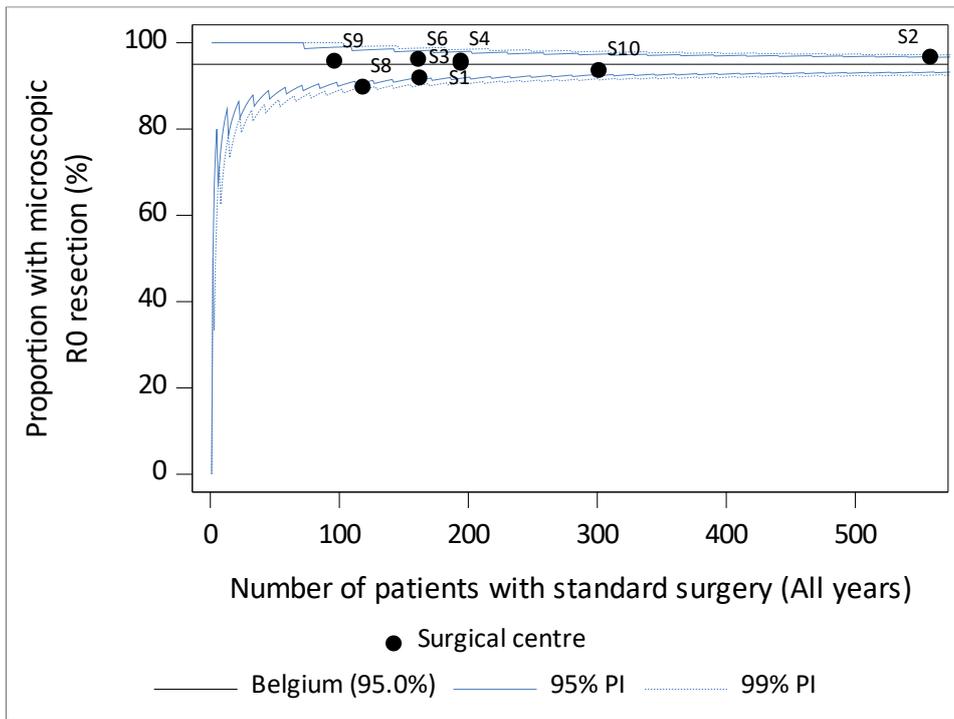
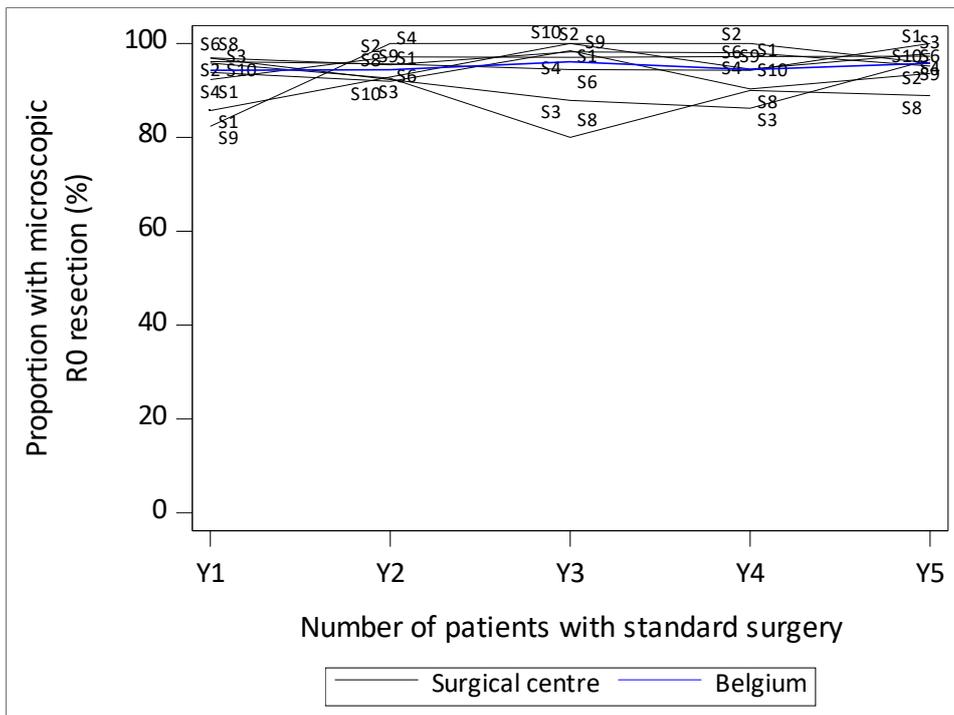


Figure 18: Funnel and spaghetti plot of operated patients with a microscopic R0 resection (**only for standard surgery**), per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)



3.3.4. Proportion of operated patients with surgical complications

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

Table 23: Observed proportion of operated patients in the five convention years with complications (90-day postoperative, in-hospital), by complication type (**standard surgery only**).

Complication type	Postoperative complications (90-day in-hospital)			
	Belgium			
	N	n	n/N (%)	95% CI
Severe surgical complications (CD IIIb-V)¹				
Year 1	395	115	29.1	[24.7, 33.9]
Year 2	380	113	29.7	[25.2, 34.6]
Year 3	408	107	26.2	[22.0, 30.8]
Year 4	369	99	26.8	[22.4, 31.7]
Year 5	356	94	26.4	[21.9, 31.3]
Pneumonia (CD I-V)*				
Year 1	395	96	24.3	[20.2, 28.8]
Year 2	380	75	19.7	[15.9, 24.1]
Year 3	408	75	18.4	[14.7, 22.5]
Year 4	369	88	23.8	[19.6, 28.5]
Year 5	356	52	14.6	[11.1, 18.7]
Oesophago-enteric leak² (CD I-V)*				
Year 1	395	55	13.9	[10.7, 17.7]
Year 2	380	61	16.1	[12.5, 20.1]
Year 3	408	58	14.2	[11.0, 18.0]
Year 4	369	68	18.4	[14.6, 22.8]
Year 5	356	65	18.3	[14.4, 22.7]
Chyle leak (CD I-V)*				
Year 1	395	30	7.6	[5.2, 10.7]
Year 2	380	27	7.1	[4.7, 10.2]
Year 3	408	32	7.8	[5.4, 10.9]
Year 4	369	21	5.7	[3.6, 8.6]
Year 5	356	30	8.4	[5.8, 11.8]

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

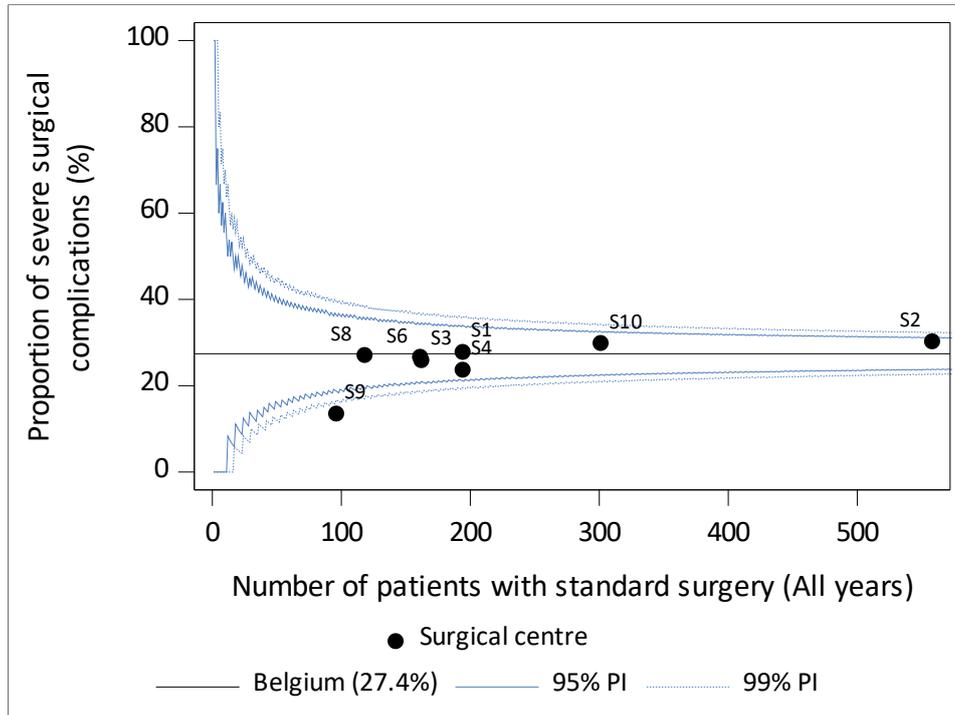
¹ CD: Clavien-Dindo grade

² Oesophago-enteric leak from anastomosis, staple line, or localised conduit necrosis.

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

Figure 20: Funnel and spaghetti plot of operated patients **with severe surgical complications (Clavien-Dindo grade IIIb-V) within 90-days post-surgery, only for standard surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.**

(a)



(b)

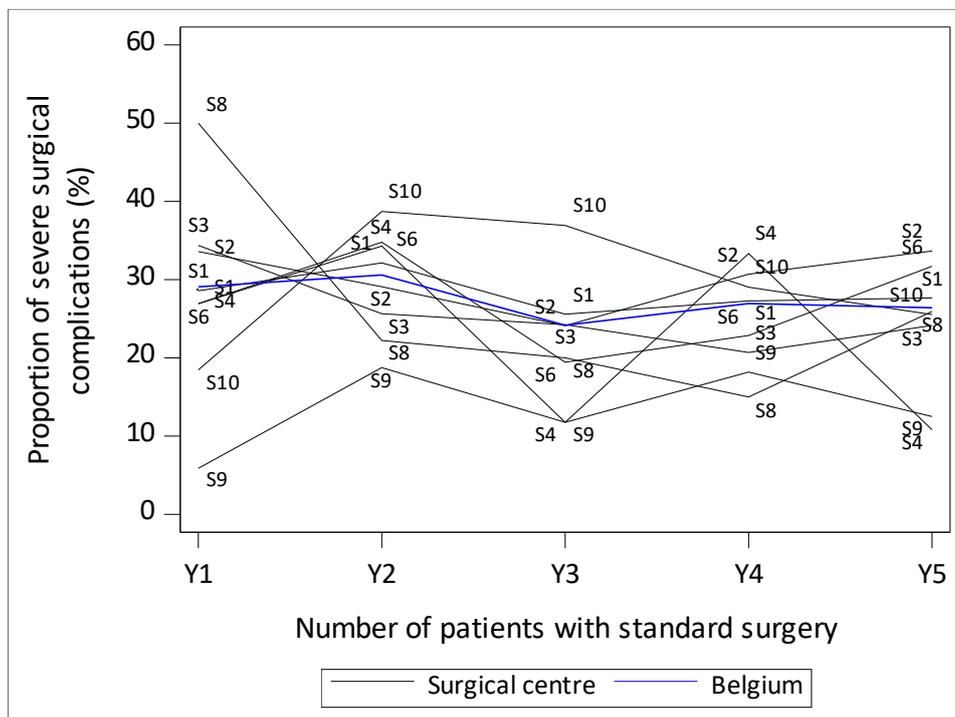
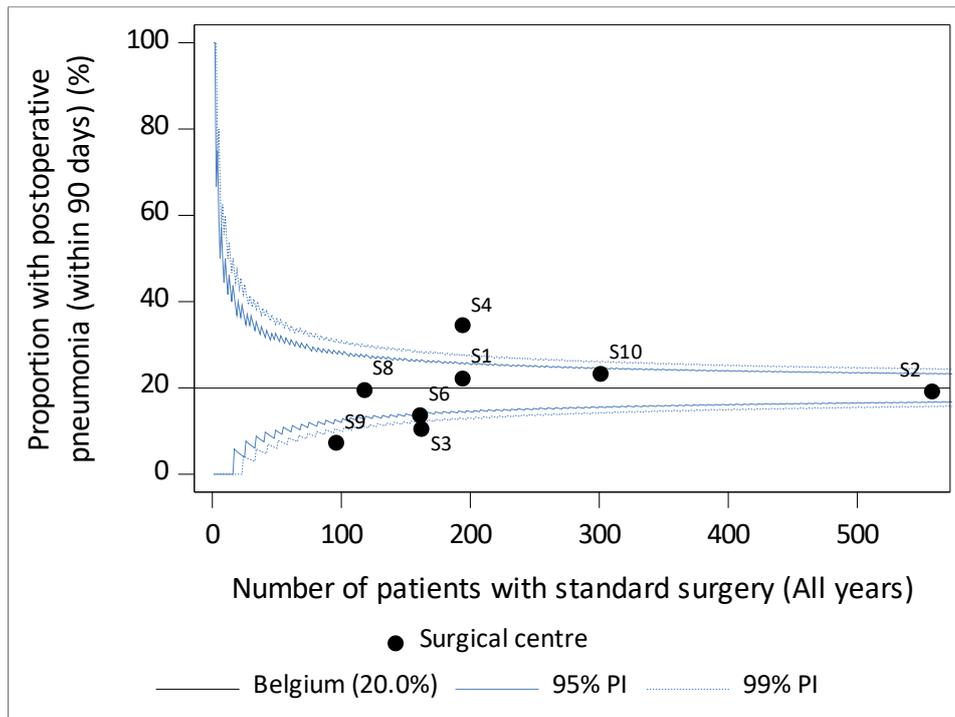


Figure 21: Funnel and spaghetti plot of operated patients **with postoperative pneumonia (Clavien-Dindo grade I-V) within 90-days post-surgery, only for standard surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.**

(a)



(b)

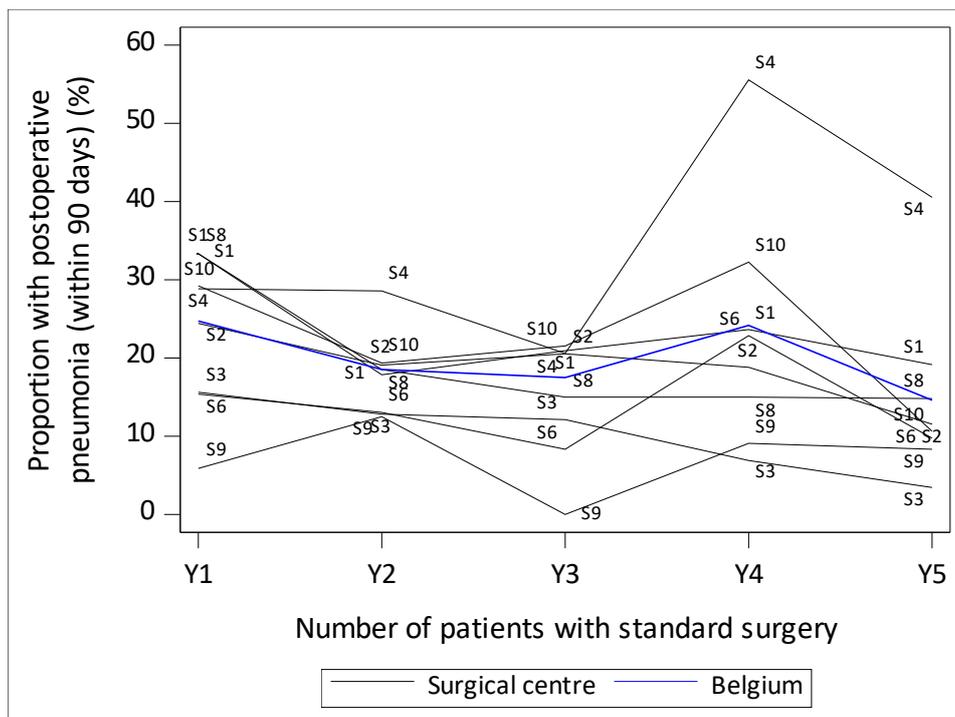
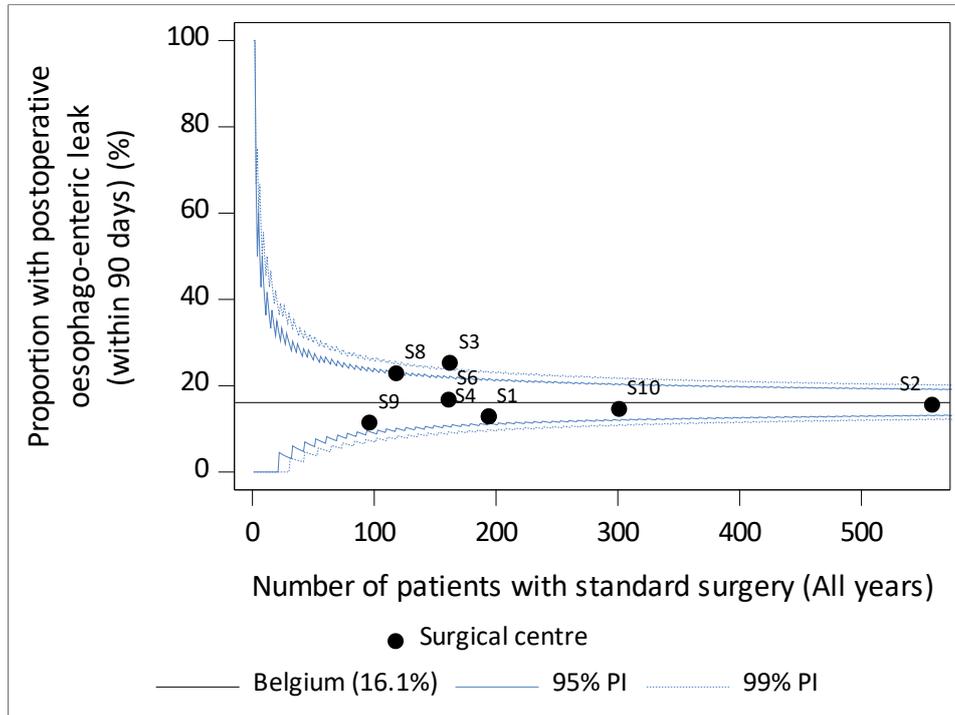


Figure 22: Funnel and spaghetti plot of operated patients **with postoperative oesophago-enteric leak (Clavien-Dindo grade I-V) within 90-days post-surgery, only for standard surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.**

(a)



(b)

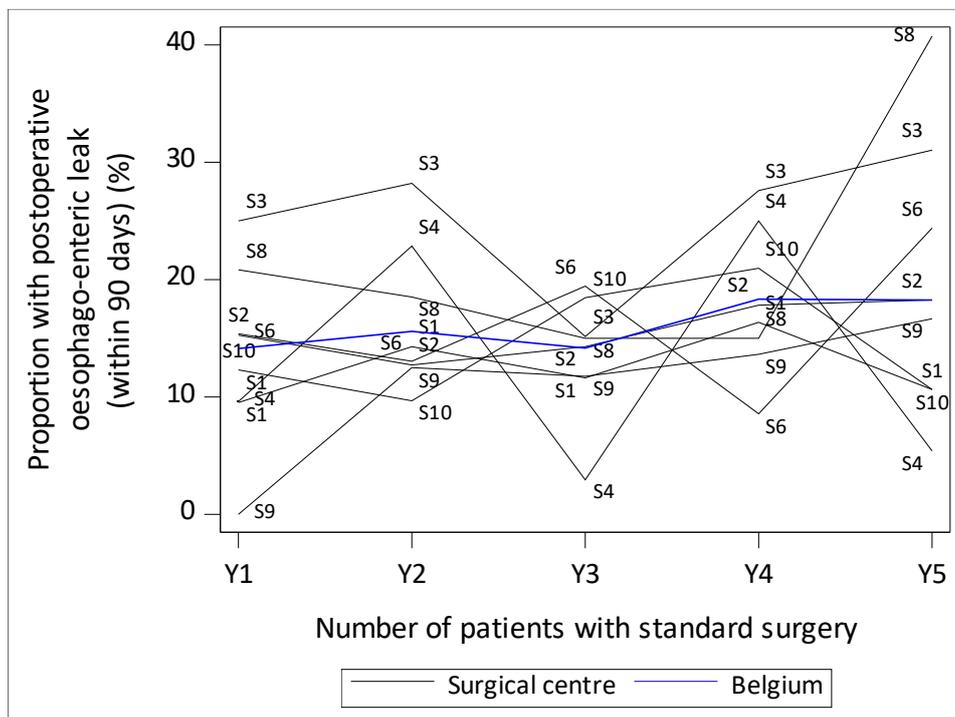
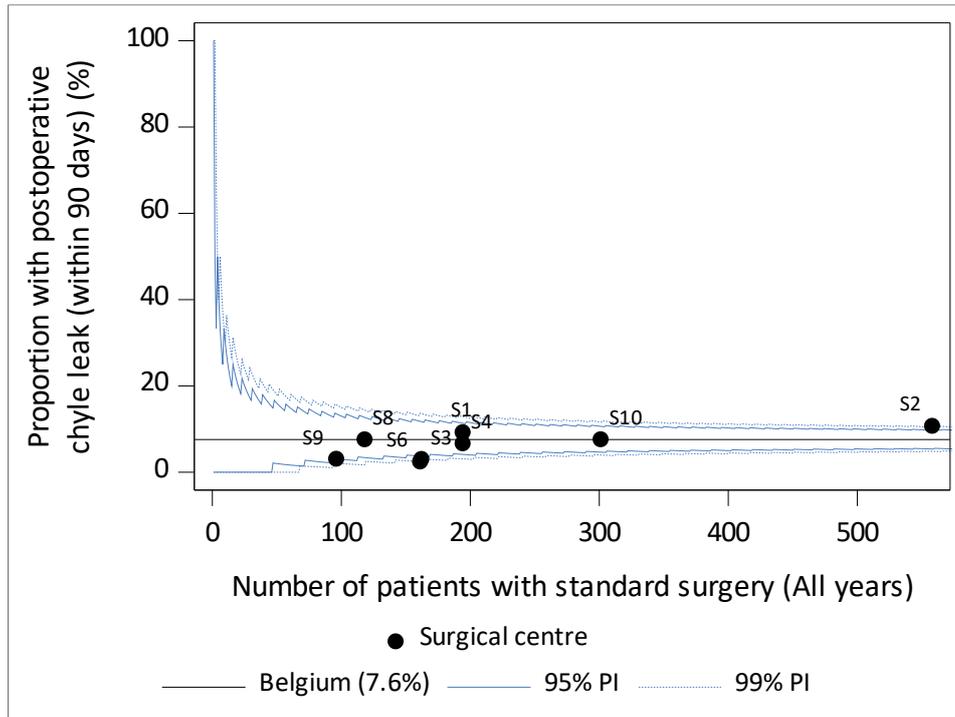
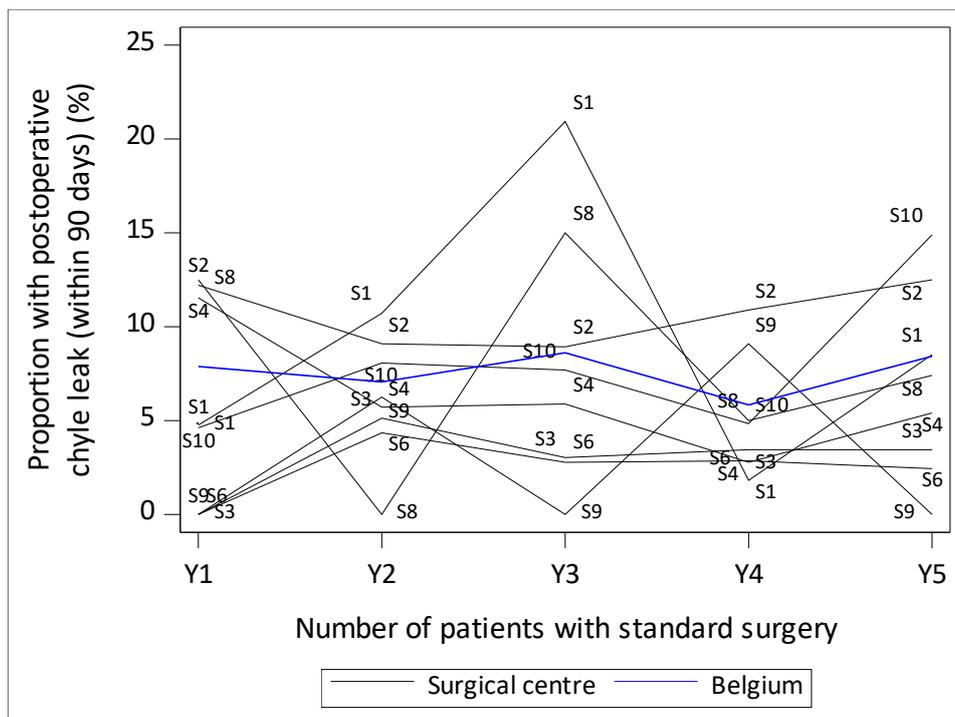


Figure 23: Funnel and spaghetti plot of operated patients **with postoperative chyle leak (Clavien-Dindo grade I-V) within 90-days post-surgery, only for standard surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.**

(a)



(b)



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

Table 24: Proportion of operated patients with severe surgical complications, by patient and tumour characteristics (standard surgery only).

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
Patients with standard surgery	1,908	528	27.7	[25.7, 29.7]
Expert centres				.
S1	194	54	27.8	[21.7, 34.7]
S2	558	169	30.3	[26.5, 34.3]
S3	162	42	25.9	[19.4, 33.4]
S4	194	46	23.7	[17.9, 30.3]
S5	64	18	28.1	[17.6, 40.8]
S6	161	43	26.7	[20.1, 34.2]
S7	60	21	35.0	[23.1, 48.4]
S8	118	32	27.1	[19.3, 36.1]
S9	96	13	13.5	[7.4, 22.0]
S10	301	90	29.9	[24.8, 35.4]
Convention year				
Year 1	395	115	29.1	[24.7, 33.9]
Year 2	380	113	29.7	[25.2, 34.6]
Year 3	408	107	26.2	[22.0, 30.8]
Year 4	369	99	26.8	[22.4, 31.7]
Year 5	356	94	26.4	[21.9, 31.3]
Sex				
Male	1,515	418	27.6	[25.4, 29.9]
Female	393	110	28.0	[23.6, 32.7]
Age at surgery				
<=69	1,164	305	26.2	[23.7, 28.8]
70-79	635	189	29.8	[26.2, 33.5]
>=80	109	34	31.2	[22.7, 40.8]
Lesion to treat (in oesophagus/GOJ)				
Primary tumour	1,863	509	27.3	[25.3, 29.4]
Relapse of primary tumour	41	18	43.9	[28.5, 60.3]
Metastasis	4	1	25.0	[0.6, 80.6]
Morphology				
Adenocarcinoma	1,429	368	25.8	[23.5, 28.1]
Squamous cell carcinoma	444	154	34.7	[30.3, 39.3]
Other, unspecified or missing	35	6	17.1	[6.6, 33.6]

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
Primary tumour localisation				
C15.0/C15.3 Cervical/upper third oesophagus	49	23	46.9	[32.5, 61.7]
C15.1/C15.4 Thoracic/middle third oesophagus	246	84	34.1	[28.2, 40.4]
C15.2/C15.5 Abdominal/lower third oesophagus	919	256	27.9	[25.0, 30.9]
C15.8 Overlapping lesion of oesophagus	11	3	27.3	[6.0, 61.0]
C15.9 Oesophagus, NOS	1	0	0.0	[0.0, 97.5]
C16.0 Gastro-oesophageal junction	677	160	23.6	[20.5, 27.0]
Other	5	2	40.0	[5.3, 85.3]
Clinical stage				
0	16	3	18.8	[4.0, 45.6]
I	170	63	37.1	[29.8, 44.8]
II	354	109	30.8	[26.0, 35.9]
III	935	230	24.6	[21.9, 27.5]
IV	333	95	28.5	[23.7, 33.7]
IVA [#]	266	73	27.4	[22.2, 33.2]
IVB [#]	63	22	34.9	[23.3, 48.0]
X	48	19	39.6	[25.8, 54.7]
TNM not applicable or relapse	52	9	17.3	[8.2, 30.3]
Prior surgery or endoscopic treatment *				
Prior major thoracic or abdominal surgery	161	49	30.4	[23.4, 38.2]
Endoscopic treatment	102	33	32.4	[23.4, 42.3]
- EMR/ESD	102	33	32.4	[23.4, 42.3]
- RFA	4	1	25.0	[0.6, 80.6]
- Ablation techniques other than RFA	0			–
Other treatment modality (that could affect the oesophagus)	31	11	35.5	[19.2, 54.6]
Neoadjuvant treatment				
Chemotherapy	521	115	22.1	[18.6, 25.9]
Targeted therapy/biologicals	21	11	52.4	[29.8, 74.3]
Radiotherapy	1	0	0.0	[0.0, 97.5]
Chemoradiotherapy	977	289	29.6	[26.7, 32.6]
No chemo, radiation or targeted treatment	408	124	30.4	[26.0, 35.1]
Charlson Comorbidity Index				
0	796	177	22.2	[19.4, 25.3]
1	505	131	25.9	[22.2, 30.0]
2	308	113	36.7	[31.3, 42.3]
3	166	57	34.3	[27.2, 42.1]
4	68	19	27.9	[17.7, 40.1]
5	26	10	38.5	[20.2, 59.4]
6	17	8	47.1	[23.0, 72.2]
7	14	8	57.1	[28.9, 82.3]

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
8	5	3	60.0	[14.7, 94.7]
9	3	2	66.7	[9.4, 99.2]
WHO score at surgery				
0 - Asymptomatic, normal activity	510	118	23.1	[19.5, 27.0]
1 - Symptomatic, but ambulant	1,142	311	27.2	[24.7, 29.9]
2 - Symptomatic, bedbound < 50% day	209	78	37.3	[30.7, 44.3]
3 - Symptomatic, bedbound > 50% day	42	19	45.2	[29.8, 61.3]
4 - Completely dependent, 100% bedbound	5	2	40.0	[5.3, 85.3]
ASA score				
1 - Healthy person	64	12	18.8	[10.1, 30.5]
2 - Mild systemic disease, normal activity	799	180	22.5	[19.7, 25.6]
3 - Serious systemic disease, limited activity	1,021	324	31.7	[28.9, 34.7]
4 - Life-threatening illness, handicapped	24	12	50.0	[29.1, 70.9]
Surgery intention				
Surgery as primary treatment	405	123	30.4	[25.9, 35.1]
Post-induction (neoadjuvant chemo- and/or radiotherapy)	1,434	374	26.1	[23.8, 28.4]
Salvage post-radical chemo- and/or radiotherapy	69	31	44.9	[32.9, 57.4]
Type of surgery				
Minimally invasive surgery (MIS)	1,262	342	27.1	[24.7, 29.6]
Open	616	168	27.3	[23.8, 31.0]
Conversion from MIS to open surgery	30	18	60.0	[40.6, 77.3]
RIZIV code for complex surgery				
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	5	0	0.0	[0.0, 52.2]
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	2	1	50.0	[1.3, 98.7]
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	558	145	26.0	[22.4, 29.8]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	1,343	382	28.4	[26.0, 30.9]
Oesophagectomy				
Partial	733	188	25.6	[22.5, 29.0]
Subtotal	1,175	340	28.9	[26.4, 31.6]
Antithrombotic medication				
No	1,538	408	26.5	[24.3, 28.8]
Yes	370	120	32.4	[27.7, 37.5]
Was the patient referred?				
No	428	112	26.2	[22.1, 30.6]
Yes	1,480	416	28.1	[25.8, 30.5]

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

Non-standard surgery (= emergency, palliative, recurrence, total laryngectomy) is not included in this table.

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

* Patients could have received a combination of treatments listed, thus the total number of treatments could be larger than the total number of patients. Combinations of prior surgery, endoscopic and neoadjuvant treatments could also occur.

Only IVA and IVB have been considered for this subsection. Their sum might therefore not be equal to the total number of clinical stage IV cases.

4. Non-malignant pathology

4.1. Descriptives

4.1.1. Patient case mix description

Table 25: Case mix description of all the patients with **non-malignant pathology** of the oesophagus/GOJ that had surgery.

Characteristic	Belgium (N=148)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
Patients with surgery	30		33		33		22		30	
Expert centres										
S1	2	6.7	0	0.0	2	6.1	3	13.6	3	10.0
S2	16	53.3	12	36.4	6	18.2	7	31.8	13	43.3
S3	1	3.3	0	0.0	0	0.0	2	9.1	2	6.7
S4	1	3.3	2	6.1	6	18.2	4	18.2	2	6.7
S5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
S6	5	16.7	3	9.1	4	12.1	1	4.5	3	10.0
S7	1	3.3	5	15.2	6	18.2	0	0.0	0	0.0
S8	0	0.0	0	0.0	2	6.1	2	9.1	2	6.7
S9	2	6.7	5	15.2	6	18.2	3	13.6	3	10.0
S10	2	6.7	6	18.2	1	3.0	0	0.0	2	6.7
Sex										
Male	13	43.3	18	54.5	17	51.5	13	59.1	15	50.0
Female	17	56.7	15	45.5	16	48.5	9	40.9	15	50.0
Age at surgery										
<=69	26	86.7	23	69.7	24	72.7	14	63.6	24	80.0
70-79	4	13.3	9	27.3	8	24.2	6	27.3	5	16.7
>=80	0	0.0	1	3.0	1	3.0	2	9.1	1	3.3
Indication										
Achalasia	2	6.7	1	3.0	4	12.1	3	13.6	5	16.7
Benign tumour	1	3.3	3	9.1	0	0.0	1	4.5	0	0.0
Boerhaave	1	3.3	4	12.1	3	9.1	1	4.5	0	0.0
Substances	2	6.7	0	0.0	4	12.1	1	4.5	7	23.3
Other	24	80.0	25	75.8	22	66.7	16	72.7	18	60.0
RIZIV code for complex surgery										
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	15	50.0	21	63.6	23	69.7	14	63.6	13	43.3
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	11	36.7	9	27.3	9	27.3	8	36.4	16	53.3

Characteristic	Belgium (N=148)									
	Year 1		Year 2		Year 3		Year 4		Year 5	
	N	%	N	%	N	%	N	%	N	%
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	2	6.7	2	6.1	0	0.0	0	0.0	0	0.0
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	2	6.7	1	3.0	1	3.0	0	0.0	1	3.3

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result per year (BE).

4.2. Outcome indicators

4.2.1. Postoperative mortality

There were 16 postoperative deaths observed for all hospitals combined in the first year after surgery for the five convention years. There were 7 postoperative deaths in the first 30 days and 10 postoperative deaths in the first 90 days. Therefore no postoperative mortality or observed survival results are given.

4.2.2. Proportion of operated patients with surgical complications

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

Table 26: Proportion of operated patients in the five convention years with complications (90-day postoperative, in-hospital), by complication type.

Complication type	Postoperative complications (90-day in-hospital)			
	Belgium			
	N	n	n/N (%)	95% CI
Severe surgical complications (CD IIIb-V)¹				
Year 1	30	5	16.7	[5.6, 34.7]
Year 2	33	9	27.3	[13.3, 45.5]
Year 3	33	12	36.4	[20.4, 54.9]
Year 4	22	8	36.4	[17.2, 59.3]
Year 5	30	10	33.3	[17.3, 52.8]
Pneumonia (CD I-V)*				
Year 1	30	4	13.3	[3.8, 30.7]
Year 2	33	3	9.1	[1.9, 24.3]
Year 3	33	3	9.1	[1.9, 24.3]
Year 4	22	3	13.6	[2.9, 34.9]
Year 5	30	4	13.3	[3.8, 30.7]
Oesophago-enteric leak ² (CD I-V)*				
Year 1	30	4	13.3	[3.8, 30.7]
Year 2	33	6	18.2	[7.0, 35.5]
Year 3	33	6	18.2	[7.0, 35.5]
Year 4	22	3	13.6	[2.9, 34.9]
Year 5	30	10	33.3	[17.3, 52.8]
Chyle leak (CD I-V)*				
Year 1	30	1	3.3	[0.1, 17.2]
Year 2	33	1	3.0	[0.1, 15.8]
Year 3	33	1	3.0	[0.1, 15.8]

Postoperative complications (90-day in-hospital)				
Belgium				
Complication type	N	n/N		95% CI
		n	(%)	
Year 4	22	0	0.0	[0.0, 15.4]
Year 5	30	2	6.7	[0.8, 22.1]

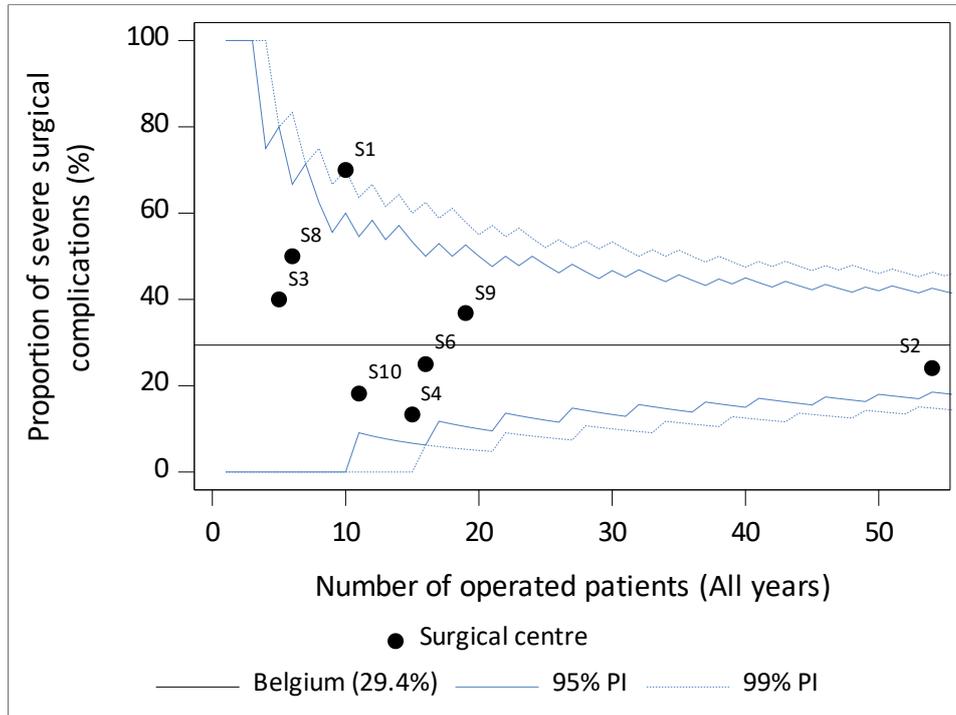
¹ CD: Clavien-Dindo grade

² Oesophago-enteric leak from anastomosis, staple line, or localised conduit necrosis

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

Figure 24: Funnel and spaghetti plot of operated patients **with severe surgical complications (Clavien-Dindo grade IIIb-V) within 90-days** post-surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

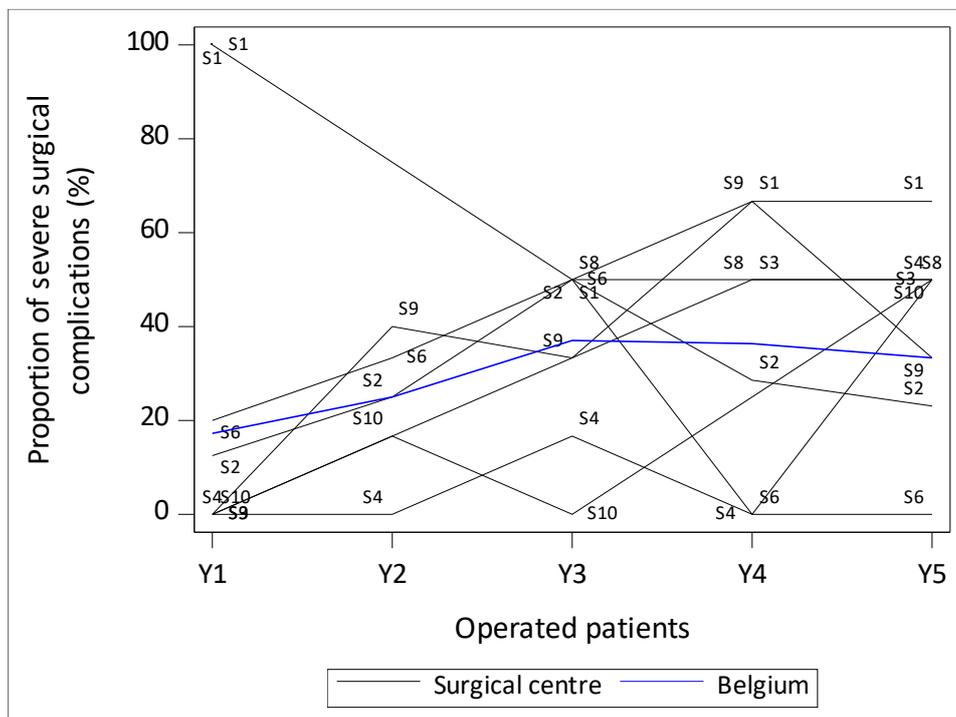
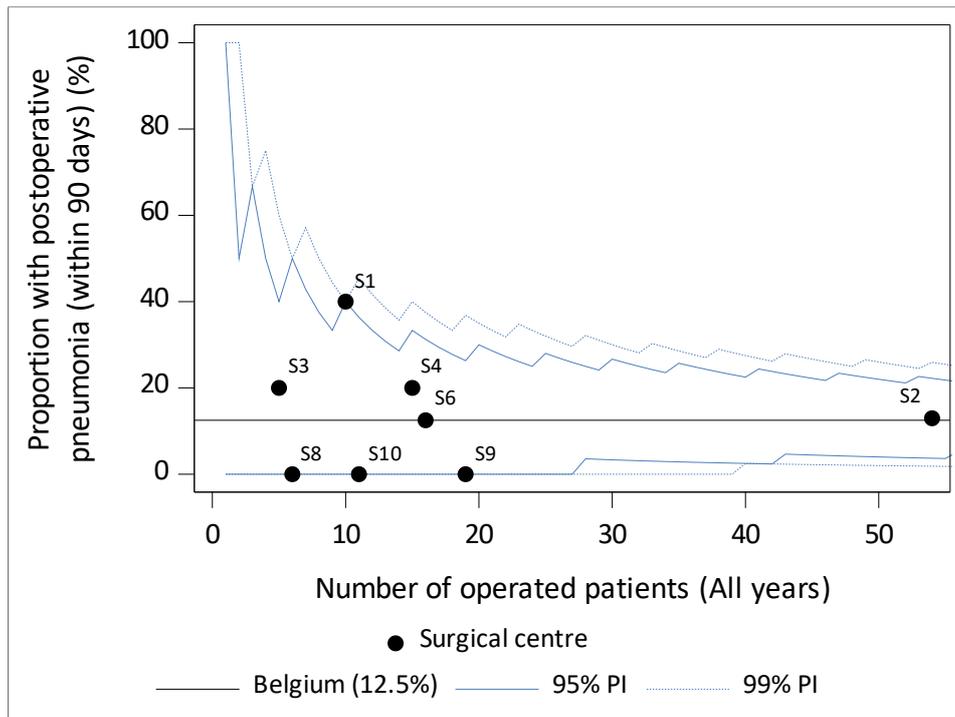


Figure 25: Funnel and spaghetti plot of operated patients **with postoperative pneumonia (Clavien-Dindo grade I-V) within 90-days** post-surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

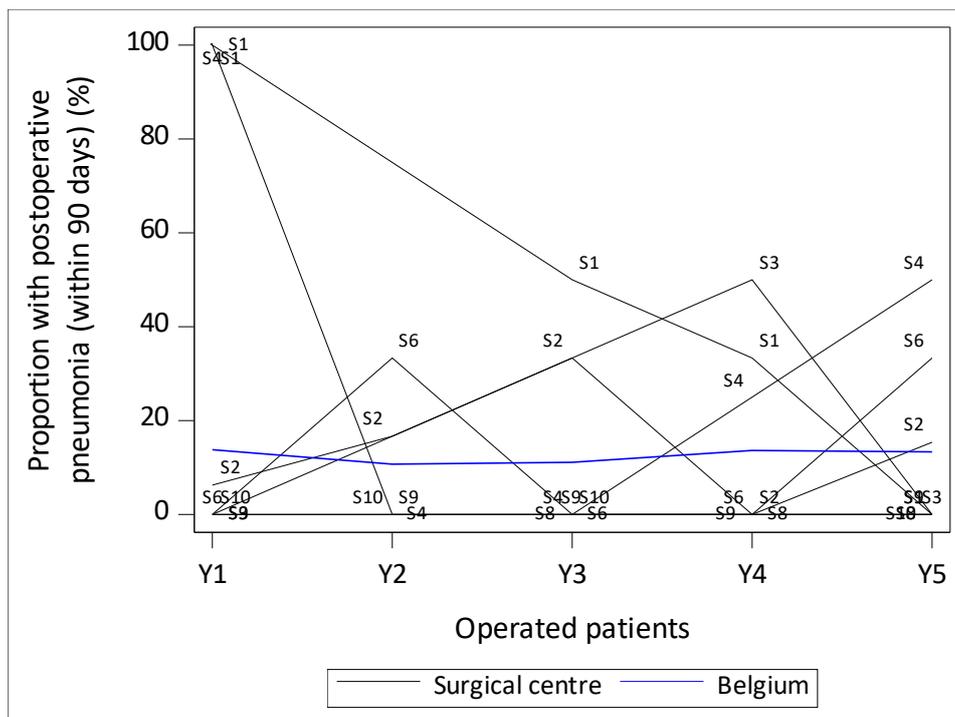
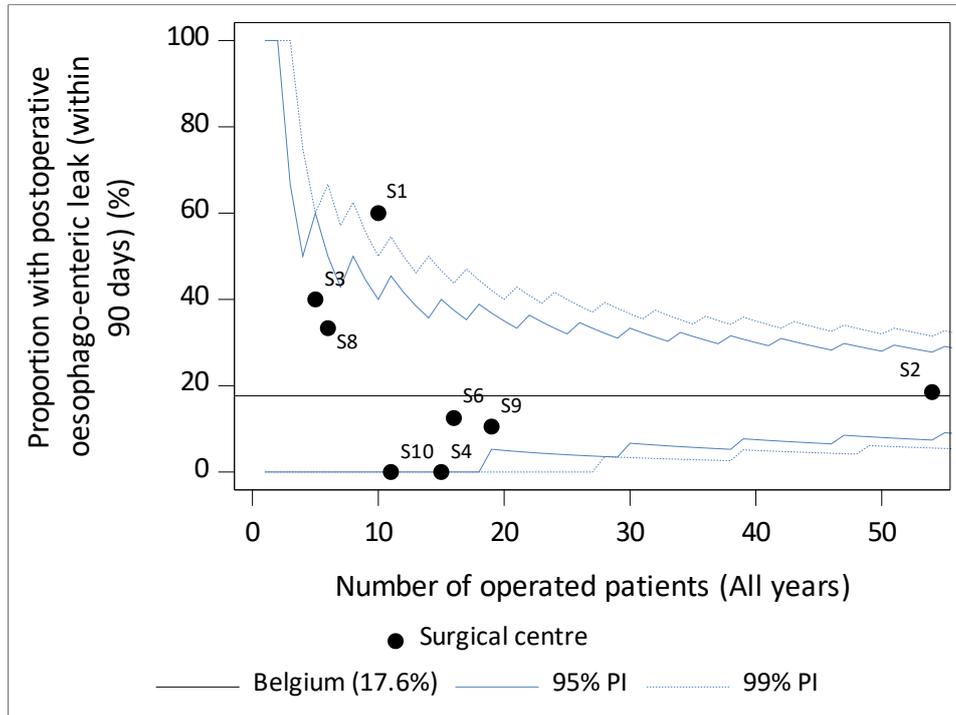


Figure 26: Funnel and spaghetti plot of operated patients **with postoperative oesophago-enteric leak (Clavien-Dindo grade I-V) within 90-days** post-surgery, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

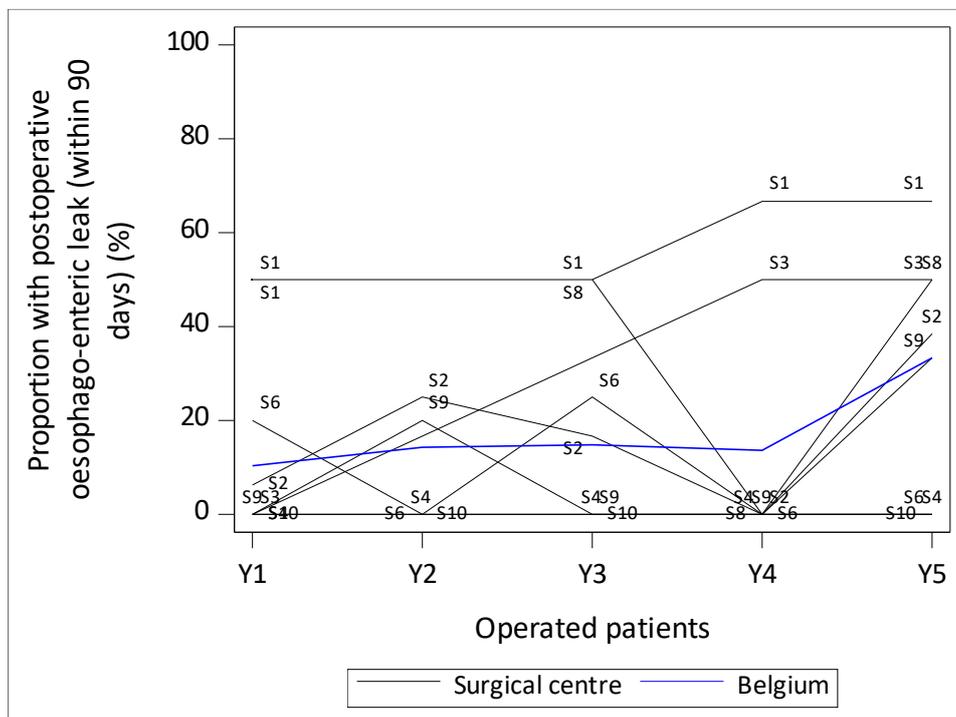
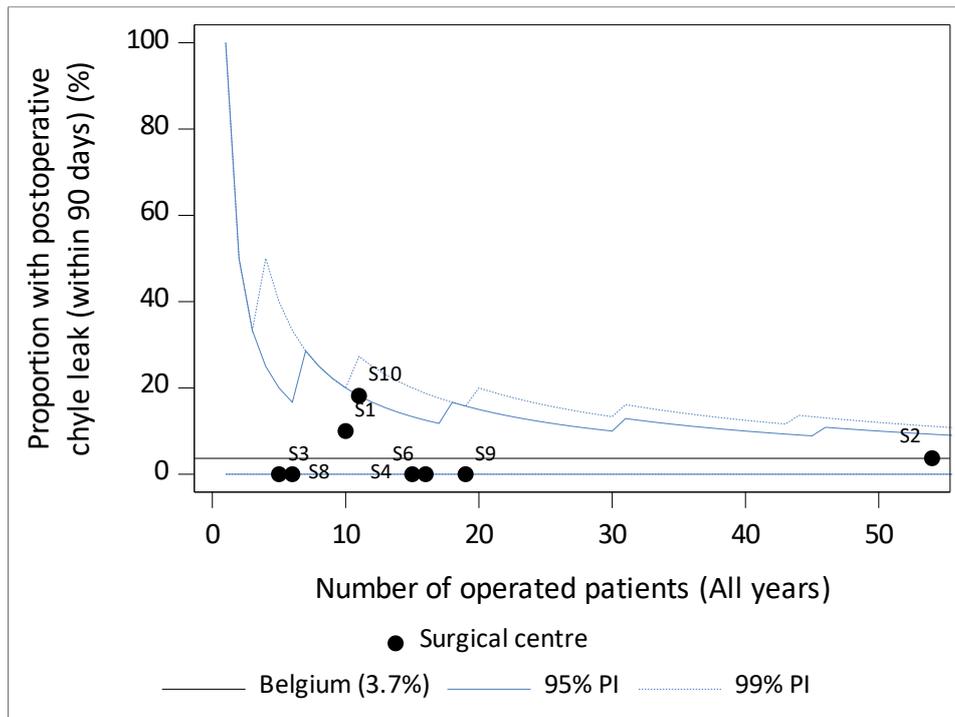
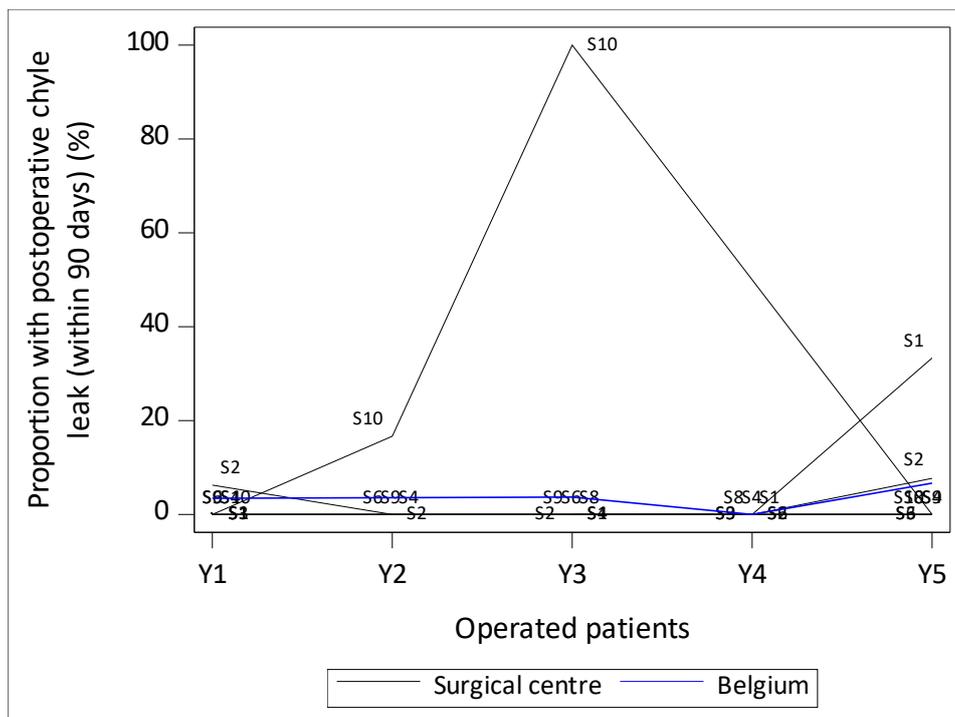


Figure 27: Funnel and spaghetti plot of operated patients **with postoperative chyle leak (Clavien-Dindo grade I-V) within 90-days** post-surgery, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)



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

Table 27: Proportion of operated patients in the five convention years with severe surgical complications, by patient and treatment characteristics.

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
Patients with surgery	148	44	29.7	[22.5, 37.8]
Expert centres				.
S1	10	7	70.0	[34.8, 93.3]
S2	54	13	24.1	[13.5, 37.6]
S3	5	2	40.0	[5.3, 85.3]
S4	15	2	13.3	[1.7, 40.5]
S5	0	0	0.0	–
S6	16	4	25.0	[7.3, 52.4]
S7	12	4	33.3	[9.9, 65.1]
S8	6	3	50.0	[11.8, 88.2]
S9	19	7	36.8	[16.3, 61.6]
S10	11	2	18.2	[2.3, 51.8]
Convention year				
Year 1	30	5	16.7	[5.6, 34.7]
Year 2	33	9	27.3	[13.3, 45.5]
Year 3	33	12	36.4	[20.4, 54.9]
Year 4	22	8	36.4	[17.2, 59.3]
Year 5	30	10	33.3	[17.3, 52.8]
Sex				
Male	76	22	28.9	[19.1, 40.5]
Female	72	22	30.6	[20.2, 42.5]
Age at surgery				
<=69	111	25	22.5	[15.1, 31.4]
70-79	32	17	53.1	[34.7, 70.9]
>=80	5	2	40.0	[5.3, 85.3]
Prior surgery or endoscopic treatment *				
Prior major thoracic or abdominal surgery	61	16	26.2	[15.8, 39.1]
Endoscopic treatment	4	2	50.0	[6.8, 93.2]
EMR/ESD	1	0	0.0	[0.0, 97.5]
RFA	0	0	0.0	–
Ablation techniques other than RFA	3	2	66.7	[9.4, 99.2]
Other treatment modality (that could affect the oesophagus)	16	9	56.3	[29.9, 80.2]
Charlson Comorbidity Index				

Characteristic	Severe surgical complications (Clavien-Dindo IIIb-V)			
	Belgium			
	N	n	n/N (%)	95% CI
0	73	22	30.1	[19.9, 42.0]
1	35	9	25.7	[12.5, 43.3]
2	20	3	15.0	[3.2, 37.9]
3	7	2	28.6	[3.7, 71.0]
4	8	4	50.0	[15.7, 84.3]
5	1	1	100.0	[2.5, 100.0]
6	2	1	50.0	[1.3, 98.7]
7	2	2	100.0	[15.8, 100.0]
WHO score at surgery				
0 - Asymptomatic, normal activity	45	7	15.6	[6.5, 29.5]
1 - Symptomatic, but ambulant	65	20	30.8	[19.9, 43.4]
2 - Symptomatic, bedbound < 50% day	11	4	36.4	[10.9, 69.2]
3 - Symptomatic, bedbound > 50% day	8	3	37.5	[8.5, 75.5]
4 - Completely dependent, 100% bedbound	19	10	52.6	[28.9, 75.6]
ASA score				
1 - Healthy person	12	3	25.0	[5.5, 57.2]
2 - Mild systemic disease, normal activity	67	17	25.4	[15.5, 37.5]
3 - Serious systemic disease, limited activity	49	14	28.6	[16.6, 43.3]
4 - Life-threatening illness, handicapped	17	8	47.1	[23.0, 72.2]
5 - Dying	3	2	66.7	[9.4, 99.2]
Surgery intention				
Surgery as primary treatment	6	1	16.7	[0.4, 64.1]
Missing	142	43	30.3	[22.9, 38.5]
Mode of surgery				
Elective	112	29	25.9	[18.1, 35.0]
Emergency	36	15	41.7	[25.5, 59.2]
Type of surgery				
Minimally invasive surgery (MIS)	40	13	32.5	[18.6, 49.1]
Open	104	29	27.9	[19.5, 37.5]
Conversion from MIS to open surgery	4	2	50.0	[6.8, 93.2]
RIZIV code for complex surgery				
228270-228281: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery	86	21	24.4	[15.8, 34.9]
228292-228303: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery	53	22	41.5	[28.1, 55.9]
228314-228325: Thoracic or thoracic-abdominal oesophagectomy or gastro-oesophagectomy in one surgery with continuity recovery and extensive lymph node removal	4	0	0.0	[0.0, 60.2]
228336-228340: Subtotal oesophagectomy up to the level of the arcus aortae, with continuity recovery and extensive lymph node removal	5	1	20.0	[0.5, 71.6]
Oesophagectomy				

Severe surgical complications (Clavien-Dindo IIIb-V)				
Belgium				
Characteristic	N	n	n/N (%)	95% CI
Partial	92	21	22.8	[14.7, 32.8]
Subtotal	50	20	40.0	[26.4, 54.8]
Total laryngectomy	6	3	50.0	[11.8, 88.2]
<i>Antithrombotic medication</i>				
No	123	32	26.0	[18.5, 34.7]
Yes	25	12	48.0	[27.8, 68.7]
<i>Was the patient referred?</i>				
No	94	25	26.6	[18.0, 36.7]
Yes	54	19	35.2	[22.7, 49.4]

S5 and S7 have been added to the hospital summary because their registrations are included in the calculation of the overall result (BE).

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

Combinations of prior surgery and endoscopic treatment could also occur.