

Belgian Cancer Registry



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

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 benign, premalignant and malignant conditions of the pancreas and/or periampullary region. All patients considered for complex surgery at a multidisciplinary consult (MC) at an expert centre were included. For the patients for whom it was decided not to perform complex surgery only the descriptives were analysed. There are 3 major types of surgical indications: malignant tumours, benign tumours and non-tumoural conditions. The report is subdivided in 2 chapters: tumoural and non-tumoural pathology.

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

1.2. Data selection criteria

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

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

Remark:

- Foreign patients were not included in the data selection criteria.
- In case that the same patient was registered by two different hospitals, the registration was assigned to the centre where the surgery was performed.
- In case that the same patient was registered by two different hospitals without any surgery, the registration was assigned to the centre where the first MC took place.
- In case that the same patient had multiple separate surgeries during the convention period, the different registrations were assessed individually to determine which registration was retained for the report.
- Registrations sent by collaborating hospitals were counted among those of the main expert centre within their collaboration.

2. General overview of registered patients

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

| Patient group | Belgium | | | | | | | | | |
|---|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| <i>Patients discussed on a MC expert</i> | 1,939 | – | 2,214 | – | 2,376 | – | 2,404 | – | 2,626 | – |
| <i>Patients with surgery</i> | 787 | 40.6^a | 928 | 41.9^a | 920 | 38.7^a | 919 | 38.2^a | 1,011 | 38.5^a |
| <i>Pathology type</i> | | | | | | | | | | |
| Malignant tumour | 598 | 76.0 ^b | 721 | 77.7 ^b | 739 | 80.3 ^b | 716 | 77.9 ^b | 799 | 79.0 ^b |
| Benign tumour | 126 | 16.0 ^b | 135 | 14.5 ^b | 112 | 12.2 ^b | 118 | 12.8 ^b | 112 | 11.1 ^b |
| Non-tumoural | 63 | 8.0 ^b | 72 | 7.8 ^b | 69 | 7.5 ^b | 85 | 9.2 ^b | 100 | 9.9 ^b |
| <i>Type of surgery</i> | | | | | | | | | | |
| 242830-242841: Pancreaticoduodenectomy | 563 | 71.5 ^b | 601 | 64.8 ^b | 597 | 64.9 ^b | 597 | 65.0 ^b | 620 | 61.3 ^b |
| Pancreaticoduodenectomy | 512 | 90.9 ^c | 548 | 91.2 ^c | 548 | 91.8 ^c | 533 | 89.3 ^c | 550 | 88.7 ^c |
| Total Pancreatectomy | 51 | 9.1 ^c | 53 | 8.8 ^c | 49 | 8.2 ^c | 64 | 10.7 ^c | 70 | 11.3 ^c |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 63 | 8.0 ^b | 104 | 11.2 ^b | 88 | 9.6 ^b | 122 | 13.3 ^b | 90 | 8.9 ^b |
| 242874-242885: Hemipancreatectomy left | 150 | 19.1 ^b | 208 | 22.4 ^b | 217 | 23.6 ^b | 191 | 20.8 ^b | 285 | 28.2 ^b |
| 242896-242900: Enucleation of a pancreatic tumour | 11 | 1.4 ^b | 15 | 1.6 ^b | 18 | 2.0 ^b | 9 | 1.0 ^b | 16 | 1.6 ^b |
| <i>Expert centres</i> | | | | | | | | | | |
| S1 | 85 | 10.8 ^b | 83 | 8.9 ^b | 98 | 10.7 ^b | 90 | 9.8 ^b | 103 | 10.2 ^b |
| S2 | 36 | 4.6 ^b | 36 | 3.9 ^b | 33 | 3.6 ^b | 41 | 4.5 ^b | 41 | 4.1 ^b |
| S3 | 21 | 2.7 ^b | 28 | 3.0 ^b | 27 | 2.9 ^b | 20 | 2.2 ^b | 29 | 2.9 ^b |
| S4 | 135 | 17.2 ^b | 154 | 16.6 ^b | 161 | 17.5 ^b | 154 | 16.8 ^b | 192 | 19.0 ^b |

| Patient group | Belgium | | | | | | | | | |
|---------------------------------|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------|-------------------------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| S5 | 37 | 4.7 ^b | 46 | 5.0 ^b | 34 | 3.7 ^b | 34 | 3.7 ^b | 44 | 4.4 ^b |
| S6 | 65 | 8.3 ^b | 69 | 7.4 ^b | 95 | 10.3 ^b | 100 | 10.9 ^b | 101 | 10.0 ^b |
| S7 | 70 | 8.9 ^b | 80 | 8.6 ^b | 64 | 7.0 ^b | 79 | 8.6 ^b | 54 | 5.3 ^b |
| S8 | 45 | 5.7 ^b | 56 | 6.0 ^b | 47 | 5.1 ^b | 58 | 6.3 ^b | 58 | 5.7 ^b |
| S9 | 87 | 11.1 ^b | 106 | 11.4 ^b | 107 | 11.6 ^b | 111 | 12.1 ^b | 115 | 11.4 ^b |
| S10 | 35 | 4.4 ^b | 27 | 2.9 ^b | 33 | 3.6 ^b | 36 | 3.9 ^b | 34 | 3.4 ^b |
| S11 | 30 | 3.8 ^b | 45 | 4.8 ^b | 37 | 4.0 ^b | 40 | 4.4 ^b | 31 | 3.1 ^b |
| S12 | 44 | 5.6 ^b | 52 | 5.6 ^b | 51 | 5.5 ^b | 45 | 4.9 ^b | 64 | 6.3 ^b |
| S13 | 30 | 3.8 ^b | 58 | 6.3 ^b | 41 | 4.5 ^b | 31 | 3.4 ^b | 38 | 3.8 ^b |
| S14 | 39 | 5.0 ^b | 51 | 5.5 ^b | 64 | 7.0 ^b | 54 | 5.9 ^b | 75 | 7.4 ^b |
| S15 | 28 | 3.6 ^b | 37 | 4.0 ^b | 28 | 3.0 ^b | 26 | 2.8 ^b | 32 | 3.2 ^b |
| Patients without surgery | 1,152 | 59.4^a | 1,286 | 58.1^a | 1,456 | 61.3^a | 1,485 | 61.8^a | 1,615 | 61.5^a |
| Pathology type | | | | | | | | | | |
| Malignant tumour | 736 | 63.9 ^b | 746 | 58.0 ^b | 809 | 55.6 ^b | 834 | 56.2 ^b | 879 | 54.4 ^b |
| Benign tumour | 258 | 22.4 ^b | 361 | 28.1 ^b | 395 | 27.1 ^b | 421 | 28.4 ^b | 501 | 31.0 ^b |
| Non-tumoural | 158 | 13.7 ^b | 179 | 13.9 ^b | 252 | 17.3 ^b | 230 | 15.5 ^b | 235 | 14.6 ^b |
| Expert centres | | | | | | | | | | |
| S1 | 59 | 5.1 ^b | 71 | 5.5 ^b | 72 | 4.9 ^b | 99 | 6.7 ^b | 91 | 5.6 ^b |
| S2 | 64 | 5.6 ^b | 79 | 6.1 ^b | 98 | 6.7 ^b | 124 | 8.4 ^b | 121 | 7.5 ^b |
| S3 | 29 | 2.5 ^b | 46 | 3.6 ^b | 89 | 6.1 ^b | 97 | 6.5 ^b | 85 | 5.3 ^b |
| S4 | 108 | 9.4 ^b | 152 | 11.8 ^b | 173 | 11.9 ^b | 144 | 9.7 ^b | 182 | 11.3 ^b |
| S5 | 48 | 4.2 ^b | 24 | 1.9 ^b | 43 | 3.0 ^b | 50 | 3.4 ^b | 97 | 6.0 ^b |
| S6 | 116 | 10.1 ^b | 112 | 8.7 ^b | 146 | 10.0 ^b | 143 | 9.6 ^b | 148 | 9.2 ^b |
| S7 | 82 | 7.1 ^b | 96 | 7.5 ^b | 99 | 6.8 ^b | 118 | 7.9 ^b | 126 | 7.8 ^b |
| S8 | 80 | 6.9 ^b | 96 | 7.5 ^b | 113 | 7.8 ^b | 119 | 8.0 ^b | 137 | 8.5 ^b |
| S9 | 101 | 8.8 ^b | 72 | 5.6 ^b | 78 | 5.4 ^b | 63 | 4.2 ^b | 77 | 4.8 ^b |
| S10 | 105 | 9.1 ^b | 98 | 7.6 ^b | 65 | 4.5 ^b | 67 | 4.5 ^b | 92 | 5.7 ^b |

| Patient group | Belgium | | | | | | | | | |
|---------------|---------|------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| S11 | 75 | 6.5 ^b | 85 | 6.6 ^b | 59 | 4.1 ^b | 30 | 2.0 ^b | 3 | 0.2 ^b |
| S12 | 51 | 4.4 ^b | 71 | 5.5 ^b | 80 | 5.5 ^b | 66 | 4.4 ^b | 85 | 5.3 ^b |
| S13 | 87 | 7.6 ^b | 111 | 8.6 ^b | 114 | 7.8 ^b | 137 | 9.2 ^b | 120 | 7.4 ^b |
| S14 | 79 | 6.9 ^b | 137 | 10.7 ^b | 184 | 12.6 ^b | 177 | 11.9 ^b | 190 | 11.8 ^b |
| S15 | 68 | 5.9 ^b | 36 | 2.8 ^b | 43 | 3.0 ^b | 51 | 3.4 ^b | 61 | 3.8 ^b |

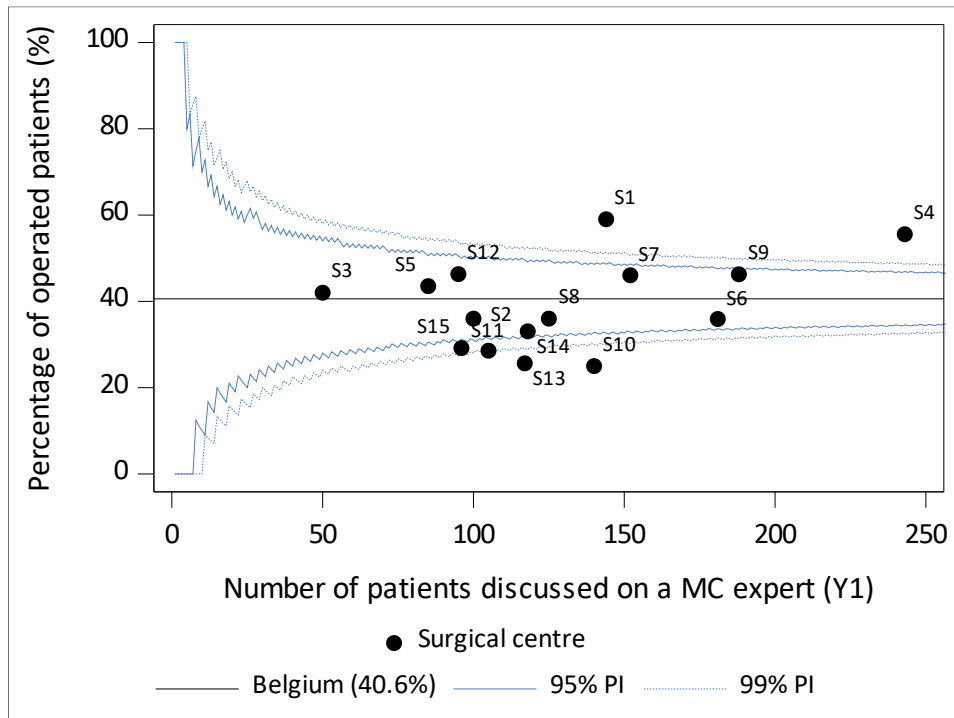
^a percentage relative to the number of patients with MC expert

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

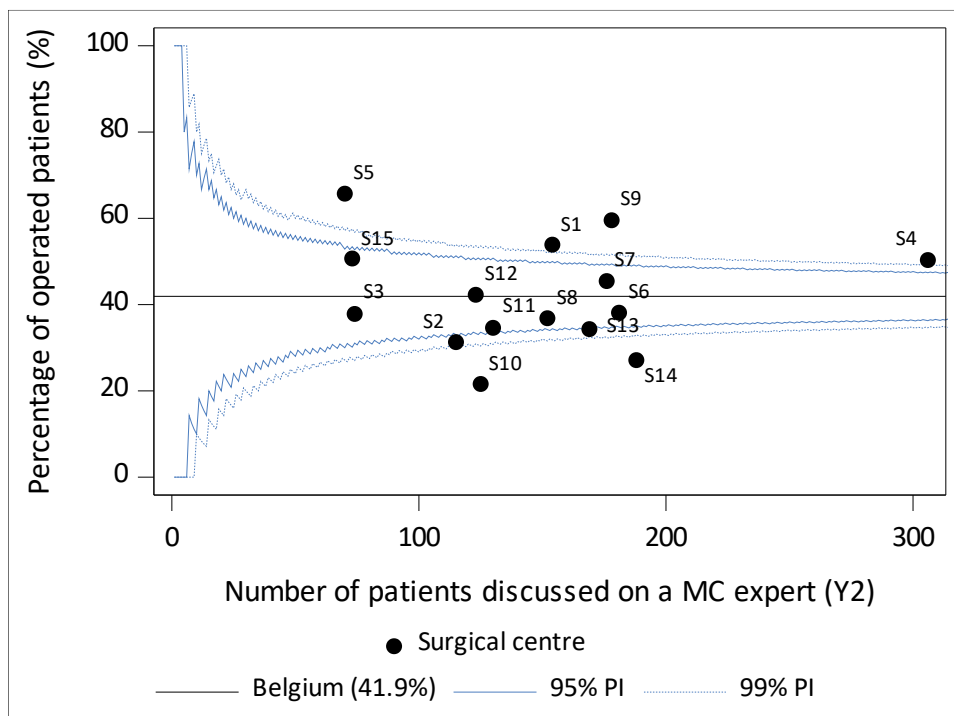
^c percentage relative to the number of patients with 242830-242841 Pancreaticoduodenectomy as type of surgery

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

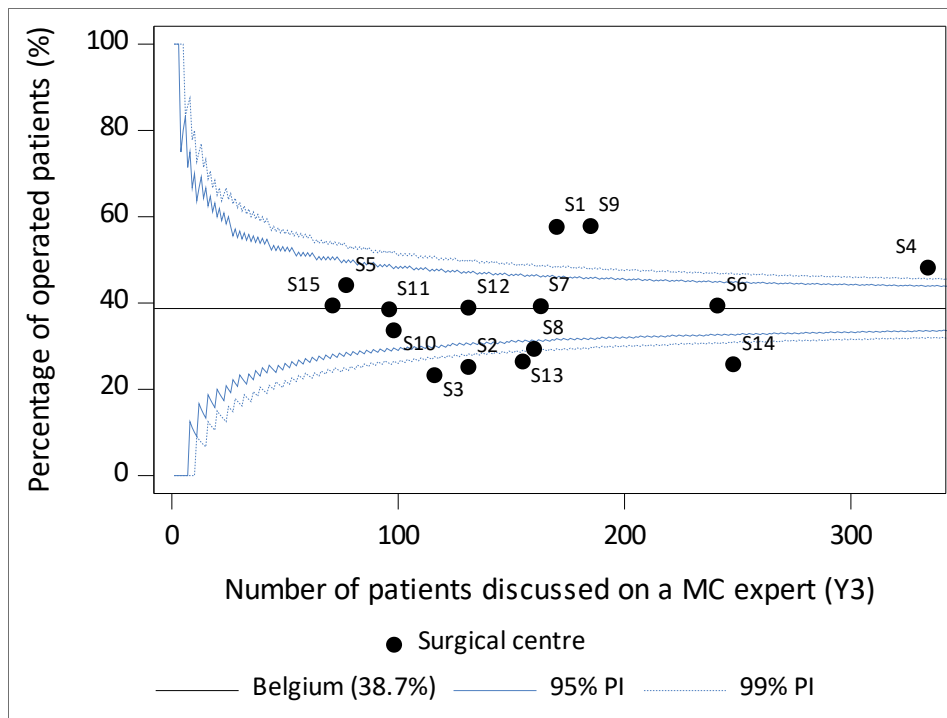
(a)



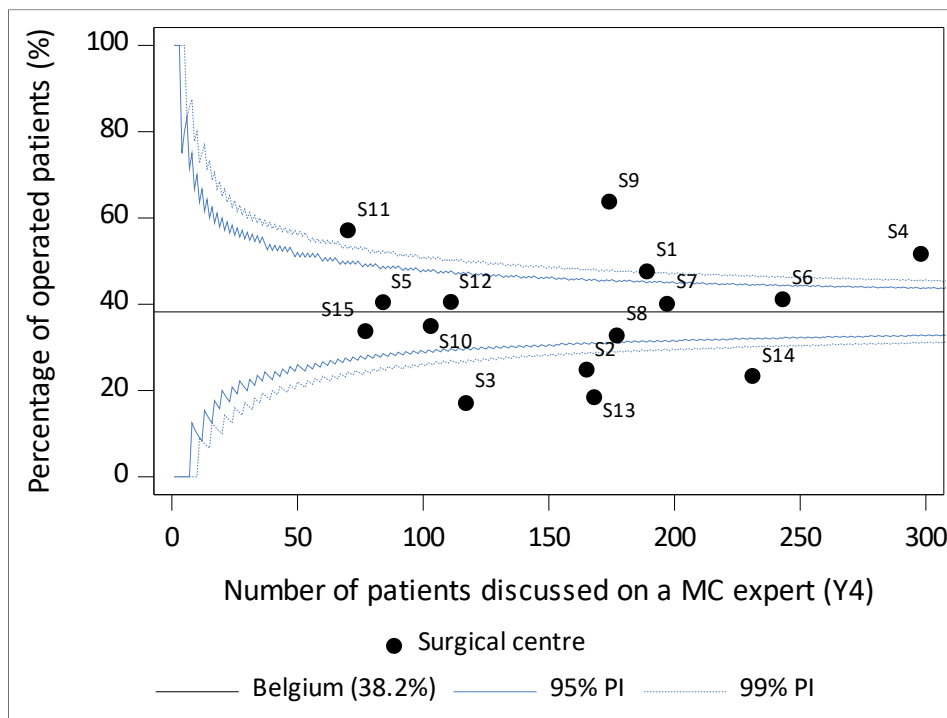
(b)



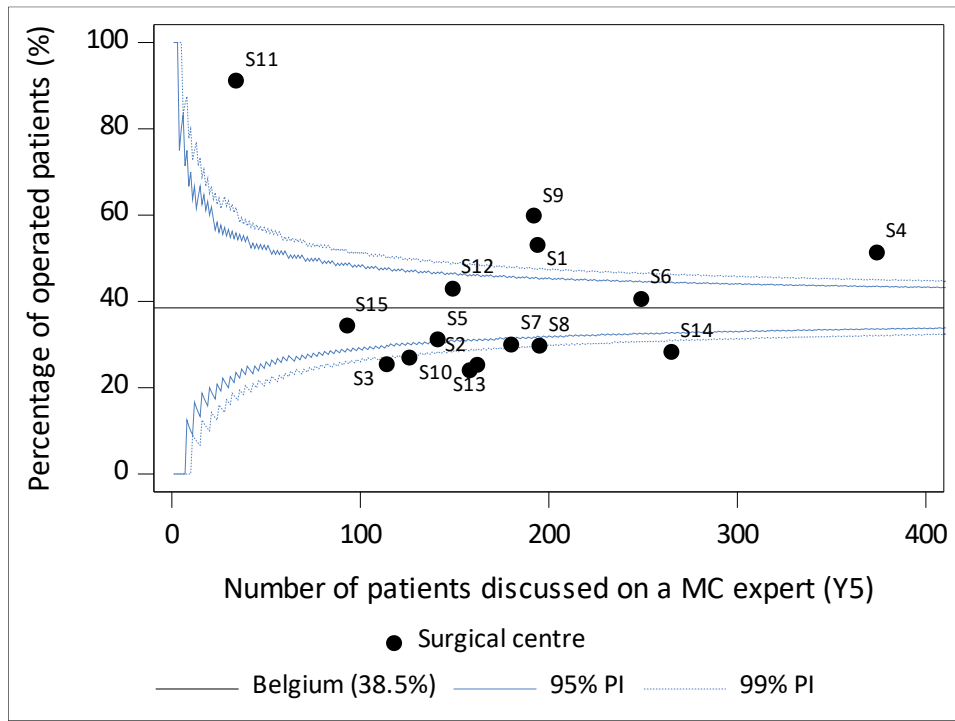
(c)



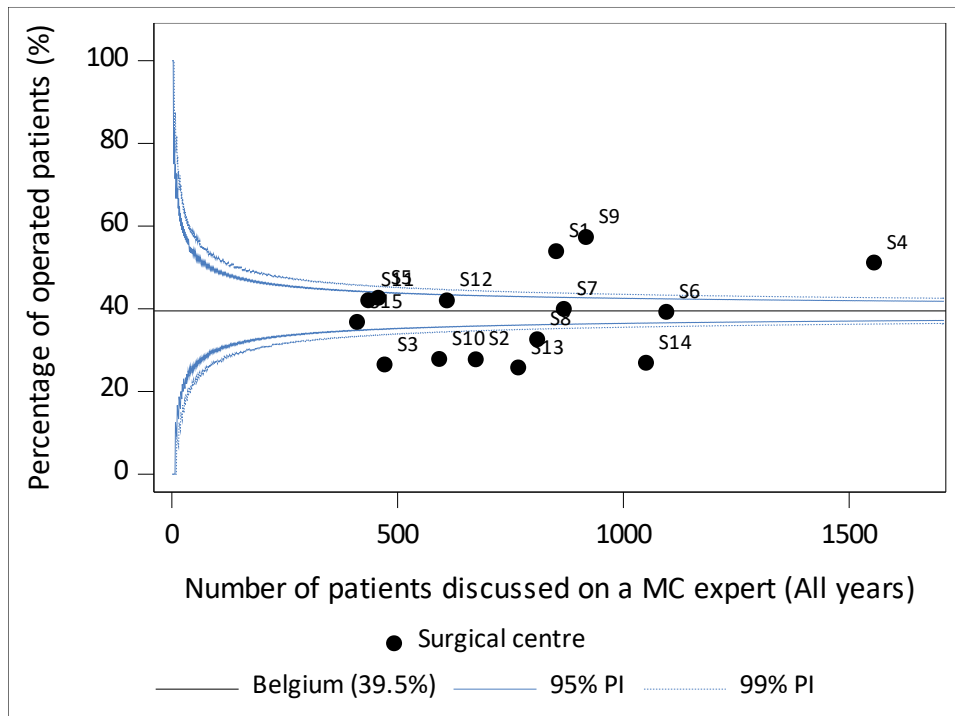
(d)



(e)



(f)



(g)

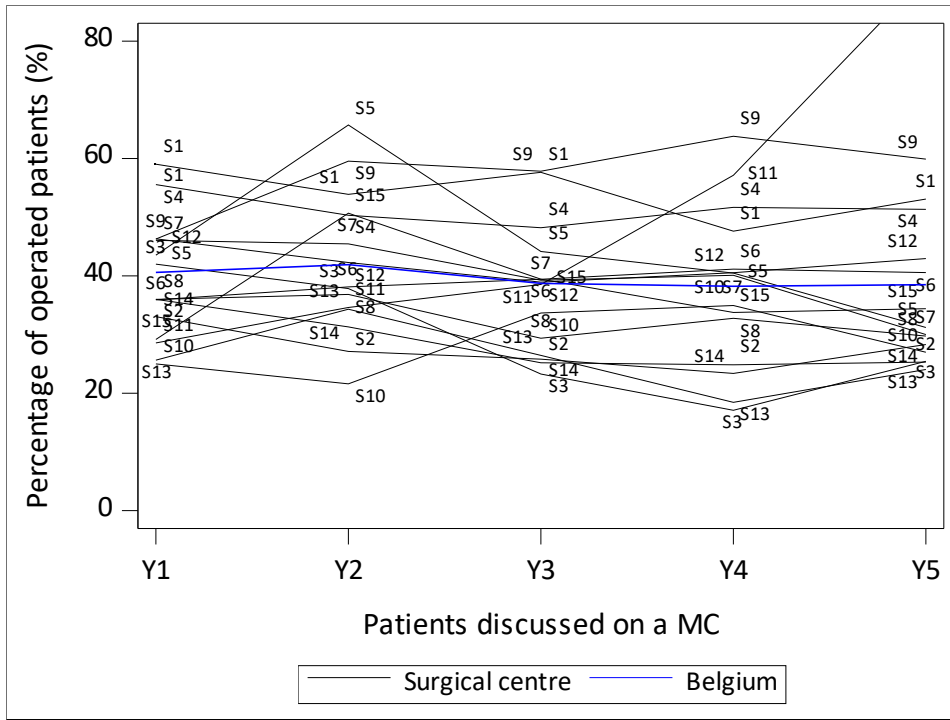
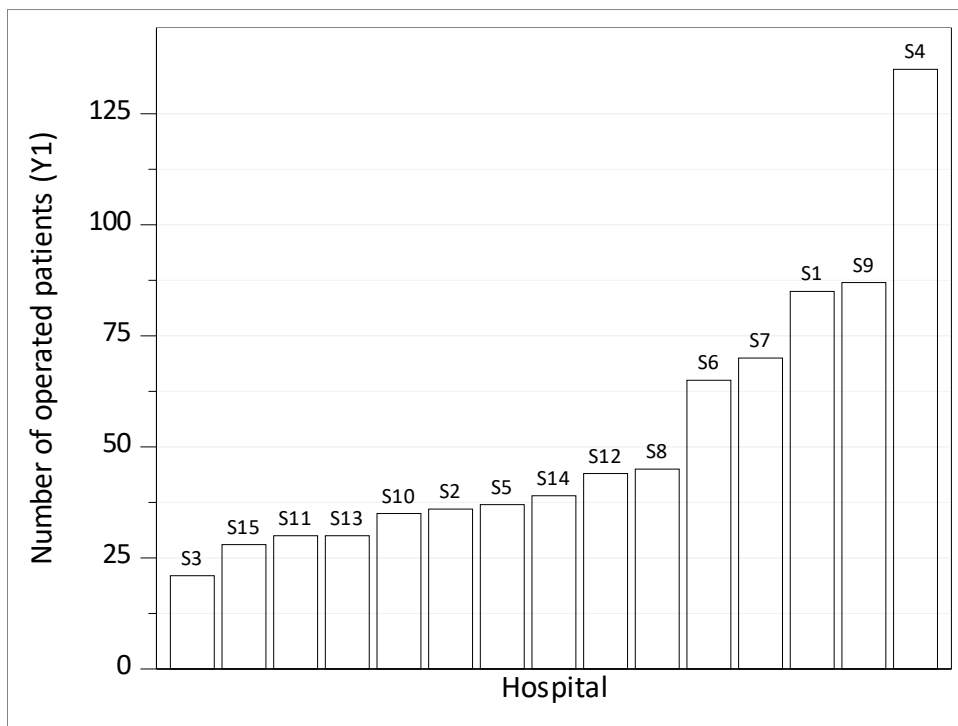
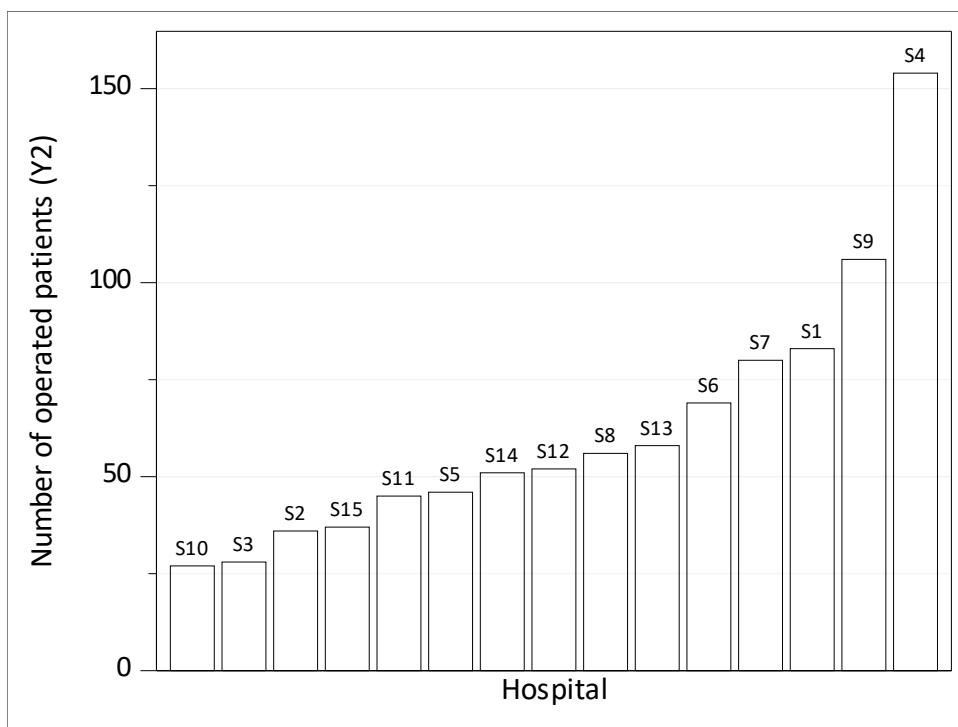


Figure 2: Absolute number of patients discussed on a MC expert that were treated with surgery in the five convention years, by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 and (f) all years combined.

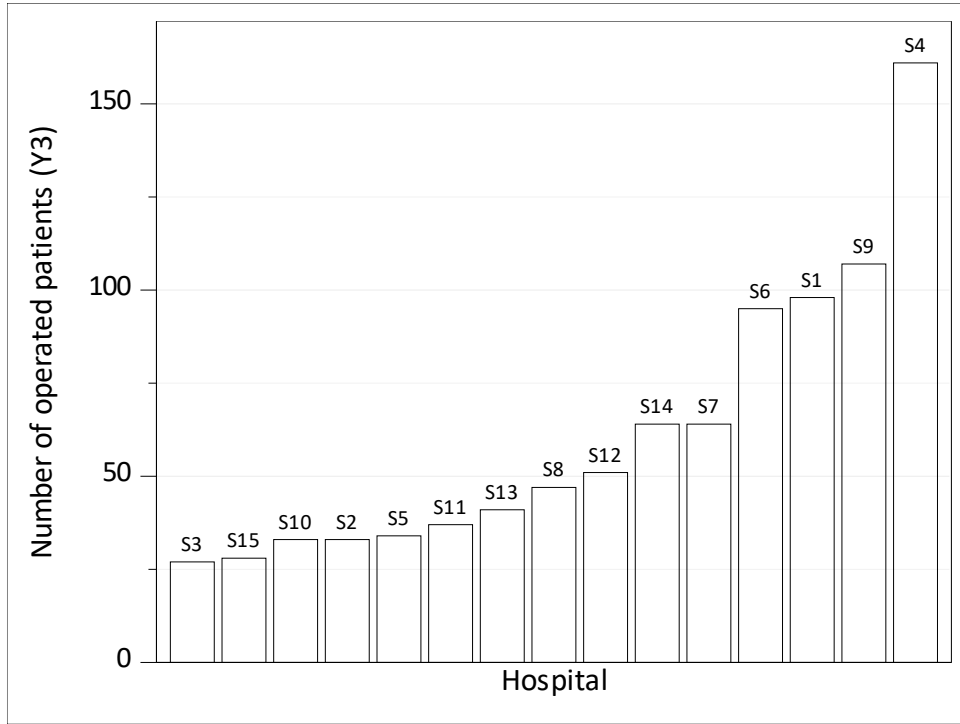
(a)



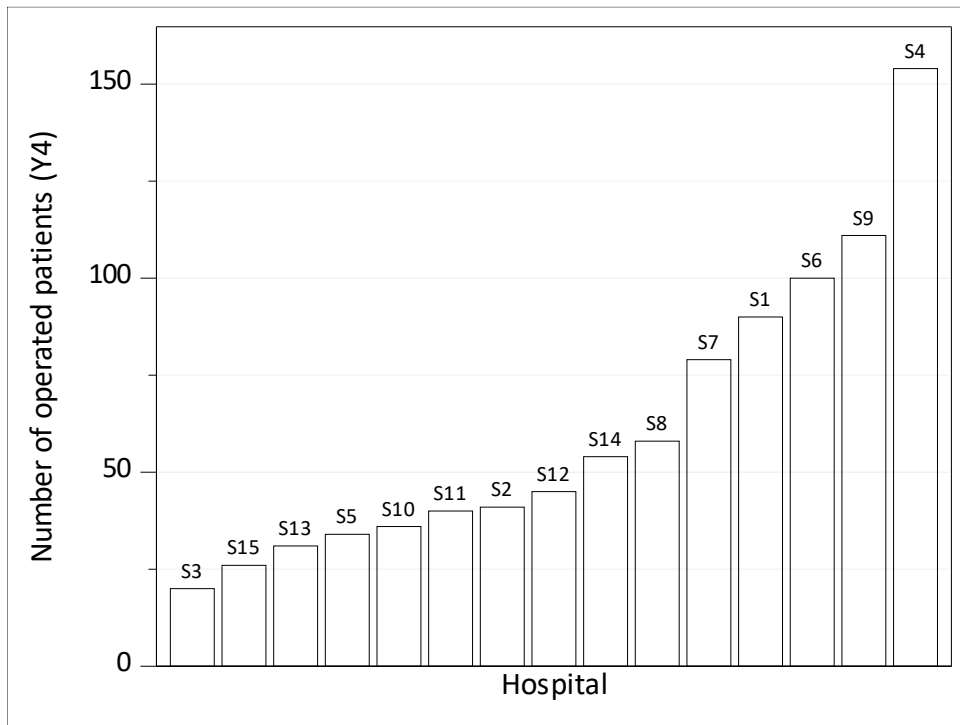
(b)



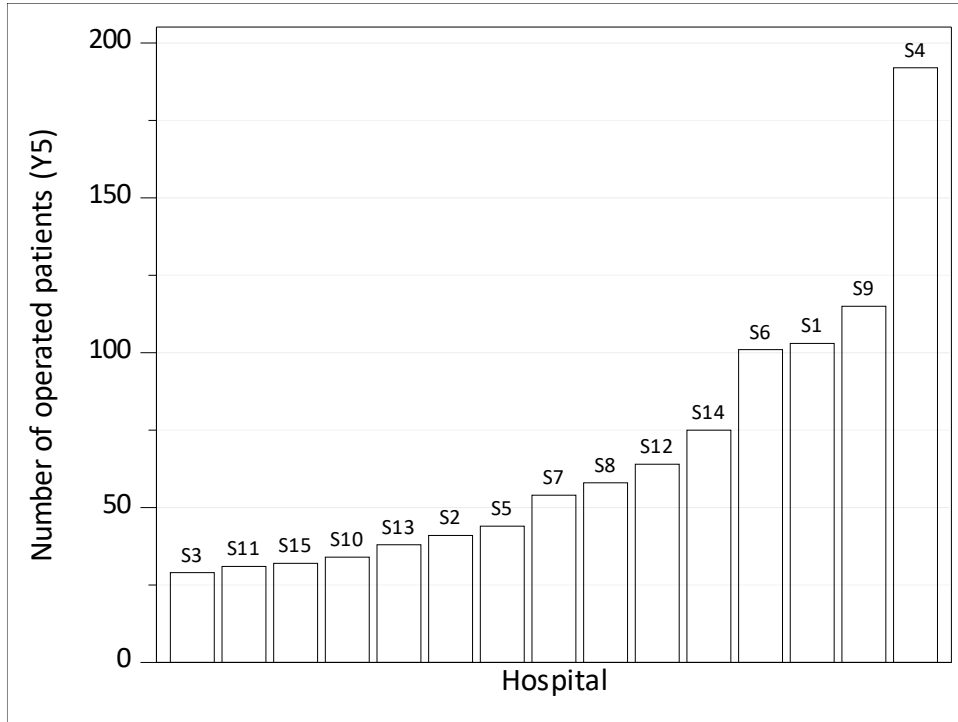
(c)



(d)



(e)



(f)

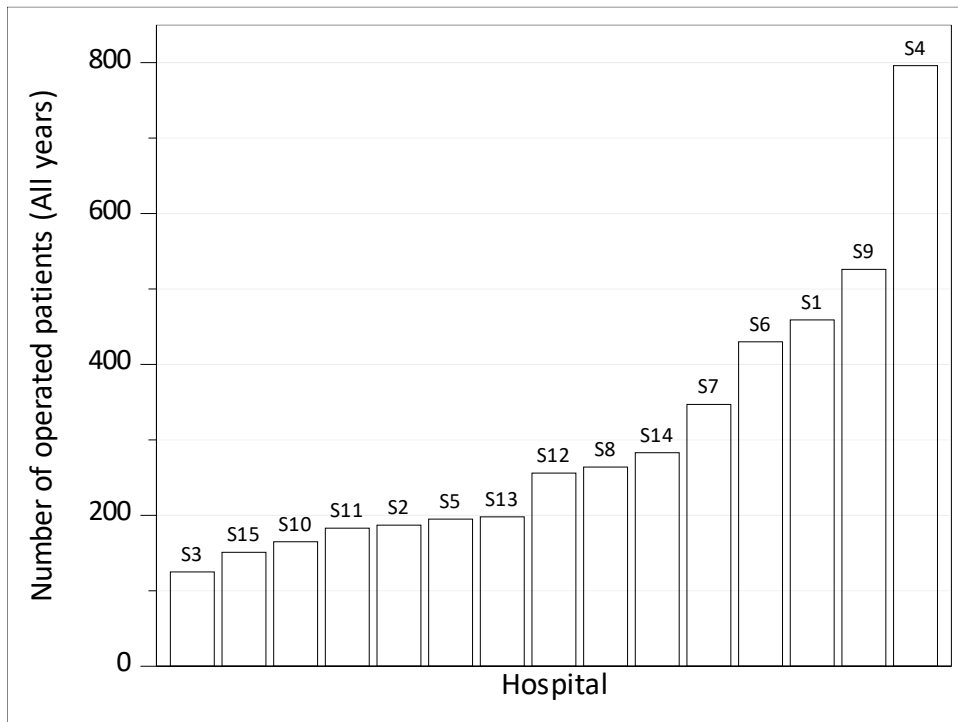
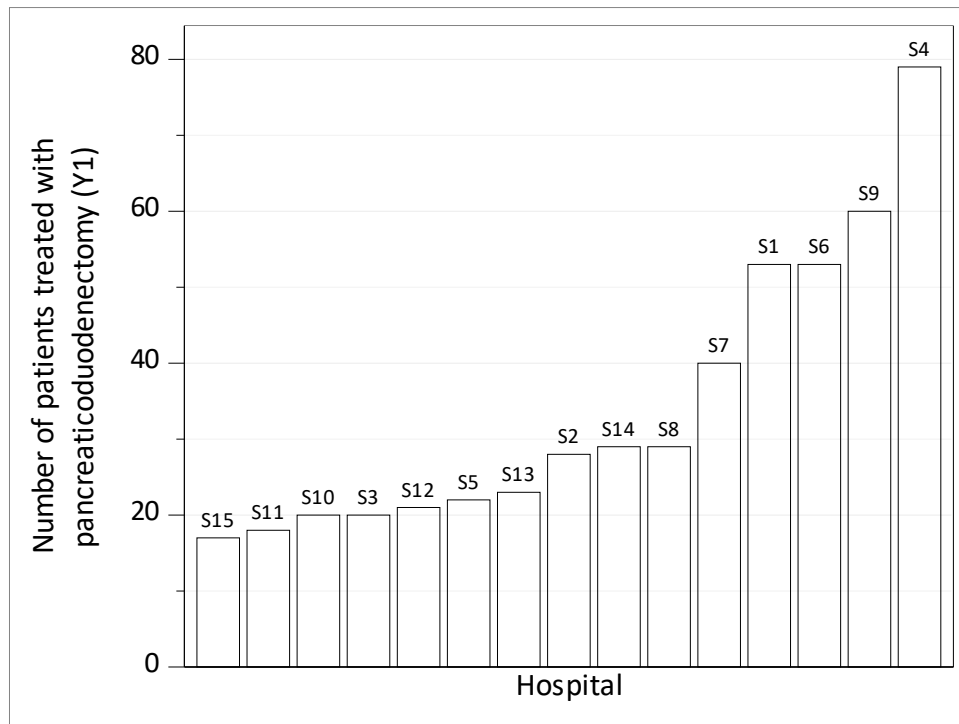
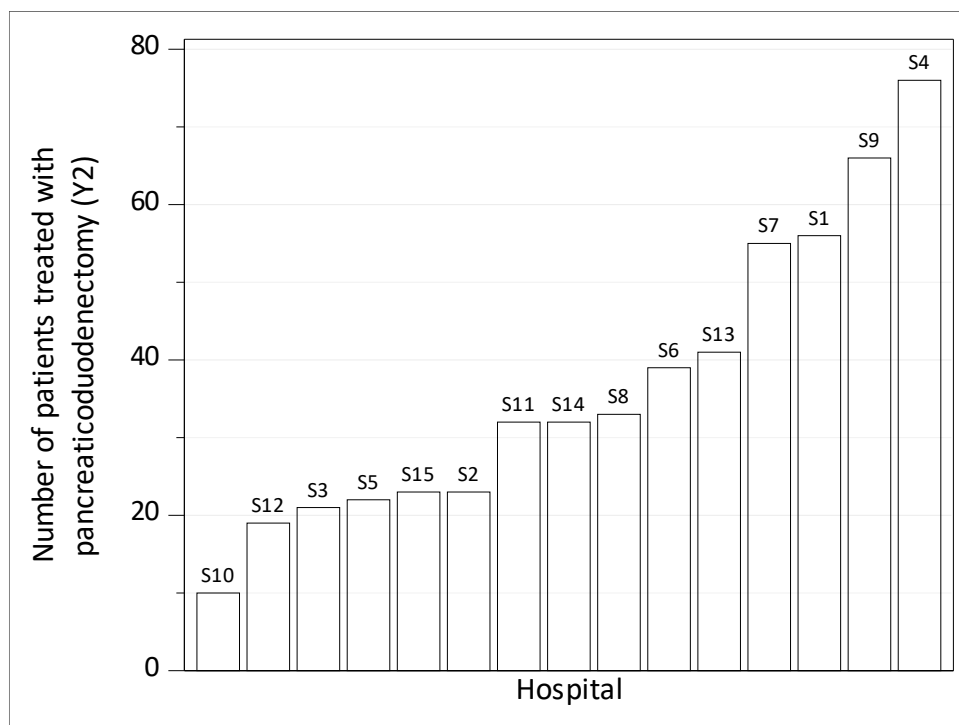


Figure 3: Absolute number of patients discussed on a MC expert that were treated with pancreaticoduodenectomy in the five convention years, by surgical centre, for (a) year 1, (b) year 2, (c) year 3, (d) year 4, (e) year 5 and (f) all years combined.

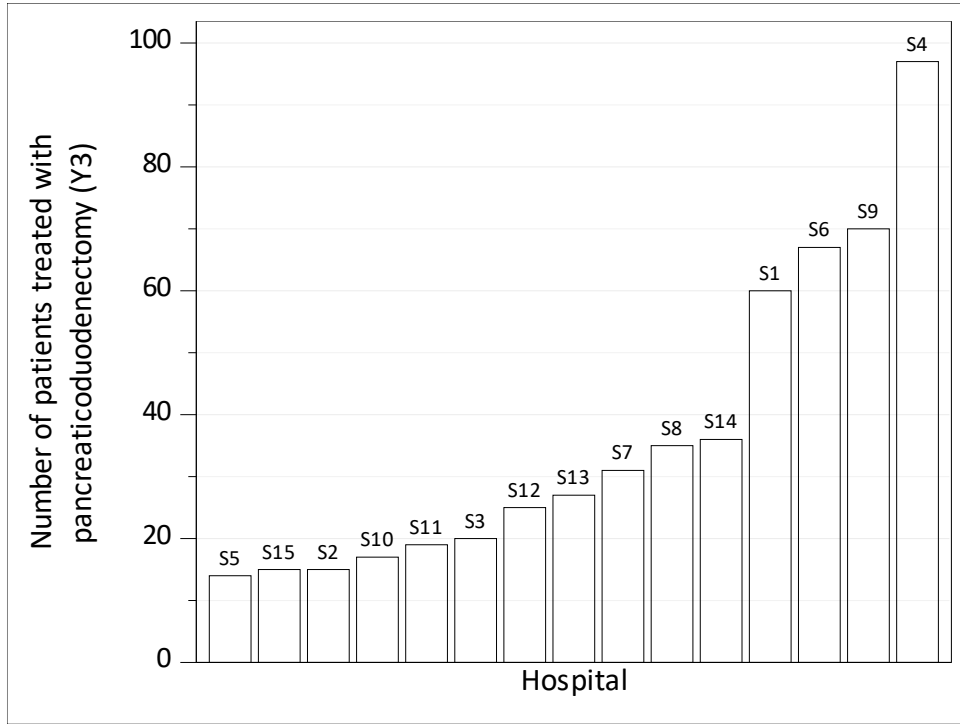
(a)



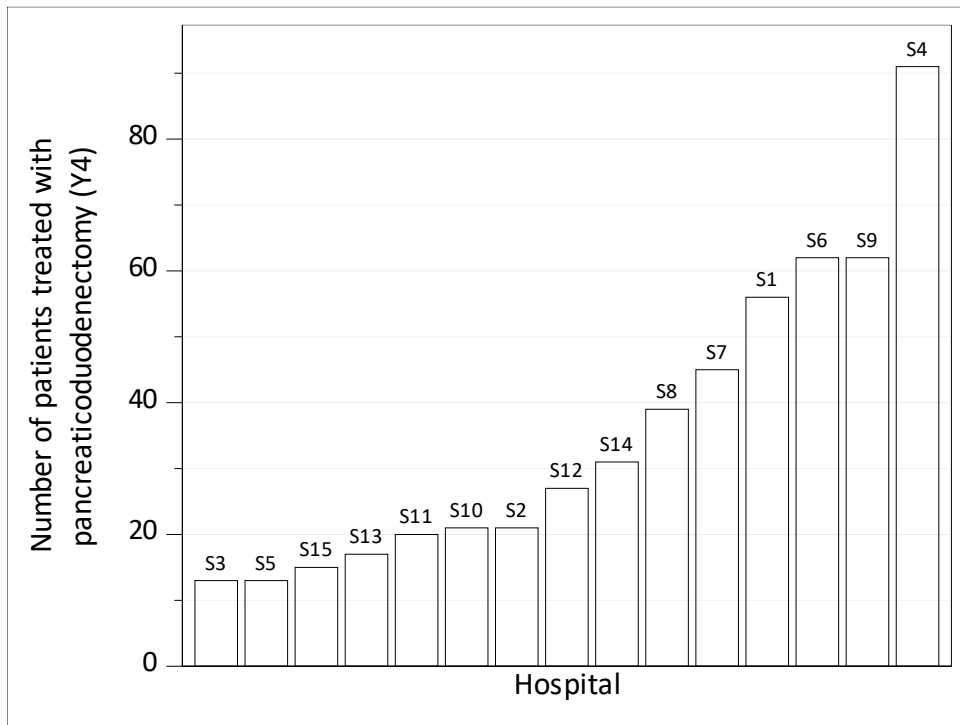
(b)



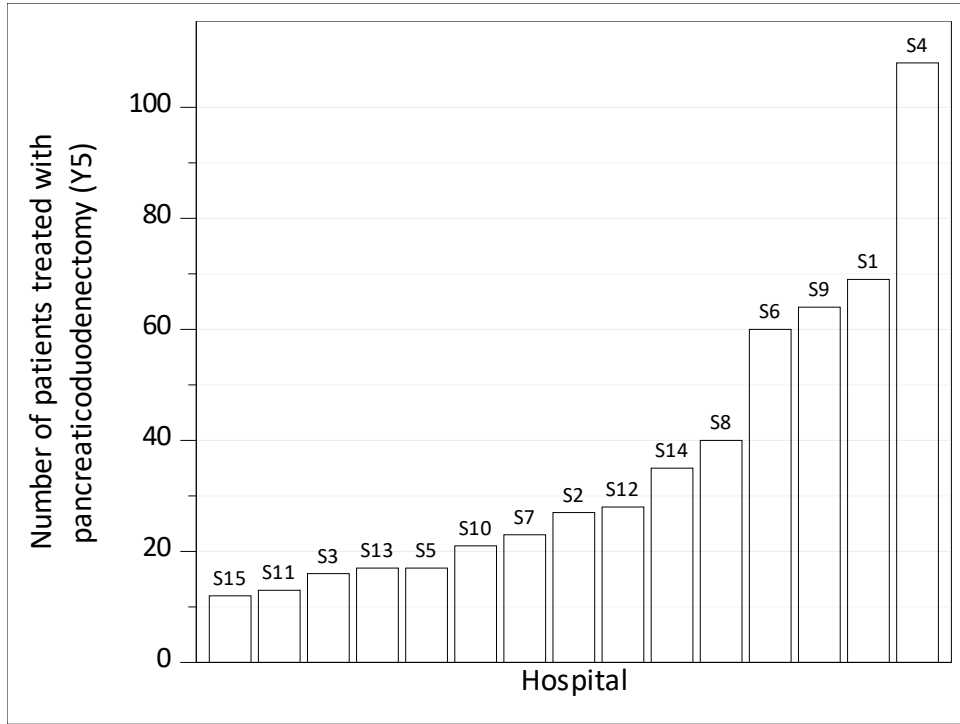
(c)



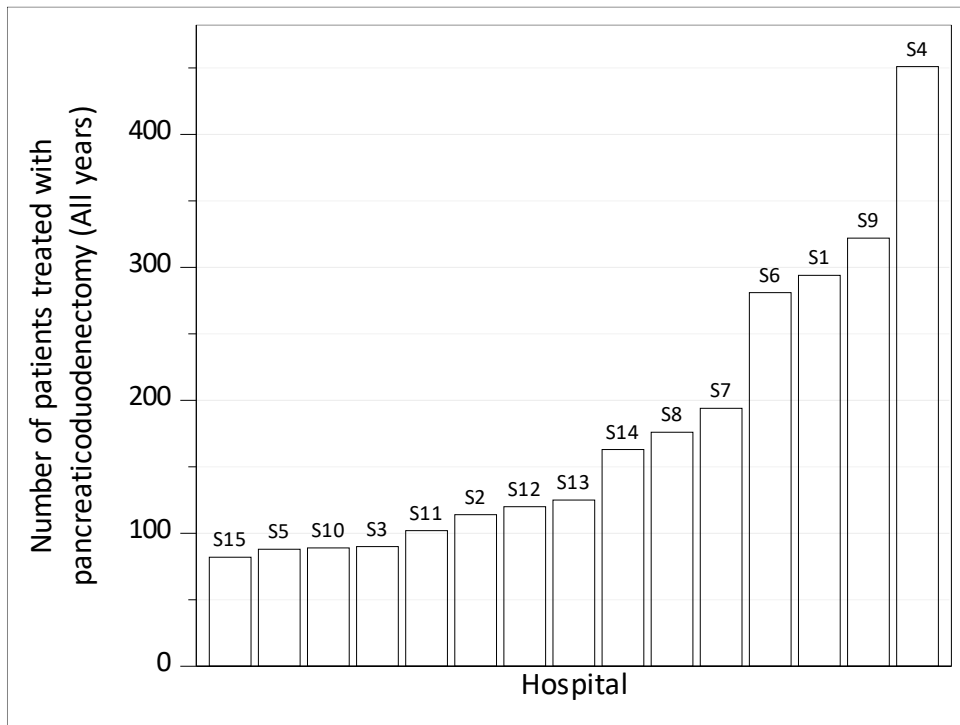
(d)



(e)



(f)



3. Tumoural pathology

3.1. Descriptives

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

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

| Characteristic | Belgium | | | | | | | | | |
|--|------------|------|------------|------|------------|------|------------|------|------------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Patients with surgery | 598 | | 721 | | 739 | | 716 | | 799 | |
| Number of patients entered in prospective clinical trial | 12 | 2.0 | 26 | 3.6 | 46 | 6.2 | 34 | 4.7 | 47 | 5.9 |
| Expert centres | | | | | | | | | | |
| S1 | 68 | 11.4 | 69 | 9.6 | 78 | 10.6 | 69 | 9.6 | 82 | 10.3 |
| S2 | 29 | 4.8 | 22 | 3.1 | 25 | 3.4 | 28 | 3.9 | 29 | 3.6 |
| S3 | 16 | 2.7 | 24 | 3.3 | 26 | 3.5 | 16 | 2.2 | 26 | 3.3 |
| S4 | 94 | 15.7 | 111 | 15.4 | 121 | 16.4 | 124 | 17.3 | 160 | 20.0 |
| S5 | 31 | 5.2 | 34 | 4.7 | 30 | 4.1 | 27 | 3.8 | 38 | 4.8 |
| S6 | 52 | 8.7 | 58 | 8.0 | 82 | 11.1 | 84 | 11.7 | 93 | 11.6 |
| S7 | 56 | 9.4 | 56 | 7.8 | 55 | 7.4 | 57 | 8.0 | 39 | 4.9 |
| S8 | 34 | 5.7 | 42 | 5.8 | 39 | 5.3 | 46 | 6.4 | 51 | 6.4 |
| S9 | 59 | 9.9 | 85 | 11.8 | 77 | 10.4 | 76 | 10.6 | 78 | 9.8 |
| S10 | 27 | 4.5 | 20 | 2.8 | 22 | 3.0 | 31 | 4.3 | 15 | 1.9 |
| S11 | 23 | 3.8 | 42 | 5.8 | 33 | 4.5 | 33 | 4.6 | 29 | 3.6 |
| S12 | 31 | 5.2 | 35 | 4.9 | 35 | 4.7 | 31 | 4.3 | 44 | 5.5 |
| S13 | 26 | 4.3 | 51 | 7.1 | 36 | 4.9 | 27 | 3.8 | 35 | 4.4 |
| S14 | 30 | 5.0 | 37 | 5.1 | 56 | 7.6 | 45 | 6.3 | 53 | 6.6 |
| S15 | 22 | 3.7 | 35 | 4.9 | 24 | 3.2 | 22 | 3.1 | 27 | 3.4 |
| Sex | | | | | | | | | | |
| Male | 324 | 54.2 | 385 | 53.4 | 406 | 54.9 | 387 | 54.1 | 454 | 56.8 |
| Female | 274 | 45.8 | 336 | 46.6 | 333 | 45.1 | 329 | 45.9 | 345 | 43.2 |
| Age at surgery | | | | | | | | | | |
| <=69 | 348 | 58.2 | 403 | 55.9 | 404 | 54.7 | 394 | 55.0 | 429 | 53.7 |
| 70-79 | 190 | 31.8 | 259 | 35.9 | 260 | 35.2 | 247 | 34.5 | 287 | 35.9 |
| >=80 | 60 | 10.0 | 59 | 8.2 | 75 | 10.1 | 75 | 10.5 | 83 | 10.4 |
| Lesion to treat (in (peri-)pancreas) | | | | | | | | | | |
| Primary tumour | 581 | 97.2 | 687 | 95.3 | 722 | 97.7 | 694 | 96.9 | 778 | 97.4 |
| Relapse of primary tumour | 12 | 2.0 | 18 | 2.5 | 9 | 1.2 | 9 | 1.3 | 5 | 0.6 |
| Metastasis | 5 | 0.8 | 16 | 2.2 | 8 | 1.1 | 13 | 1.8 | 16 | 2.0 |
| Malignant morphology | | | | | | | | | | |
| Adenocarcinoma | 476 | 79.6 | 554 | 76.8 | 552 | 74.7 | 545 | 76.1 | 579 | 72.5 |

| Characteristic | Belgium | | | | | | | | | |
|---|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Neuroendocrine tumour | 67 | 11.2 | 114 | 15.8 | 123 | 16.6 | 102 | 14.2 | 129 | 16.1 |
| Other or unspecified | 55 | 9.2 | 53 | 7.4 | 64 | 8.7 | 69 | 9.6 | 91 | 11.4 |
| Primary tumour localisation | | | | | | | | | | |
| C17.0 Duodenum | 36 | 6.0 | 21 | 2.9 | 39 | 5.3 | 49 | 6.8 | 35 | 4.4 |
| C24.0 Extrahepatic bile duct | 45 | 7.5 | 52 | 7.2 | 44 | 6.0 | 40 | 5.6 | 33 | 4.1 |
| C24.1 (Peri-) ampullary region | 54 | 9.0 | 73 | 10.1 | 73 | 9.9 | 73 | 10.2 | 72 | 9.0 |
| C25.0 Head of pancreas | 287 | 48.0 | 307 | 42.6 | 329 | 44.5 | 306 | 42.7 | 344 | 43.1 |
| C25.1 Body of pancreas | 33 | 5.5 | 85 | 11.8 | 72 | 9.7 | 73 | 10.2 | 110 | 13.8 |
| C25.2 Tail of pancreas | 74 | 12.4 | 108 | 15.0 | 109 | 14.7 | 111 | 15.5 | 140 | 17.5 |
| C25.3 Pancreatic duct | 5 | 0.8 | 4 | 0.6 | 1 | 0.1 | 4 | 0.6 | 4 | 0.5 |
| C25.4 Islands of Langerhans | 0 | 0.0 | 4 | 0.6 | 22 | 3.0 | 7 | 1.0 | 1 | 0.1 |
| C25.7-9 Other specified parts of pancreas | 44 | 7.4 | 44 | 6.1 | 36 | 4.9 | 27 | 3.8 | 31 | 3.9 |
| Other | 20 | 3.3 | 23 | 3.2 | 14 | 1.9 | 26 | 3.6 | 29 | 3.6 |
| Clinical stage | | | | | | | | | | |
| 0 | 12 | 2.1 | 6 | 0.9 | 23 | 3.2 | 14 | 2.0 | 29 | 3.7 |
| I | 278 | 48.5 | 334 | 47.9 | 358 | 49.9 | 339 | 48.6 | 408 | 52.2 |
| II | 145 | 25.3 | 228 | 32.7 | 198 | 27.6 | 215 | 30.8 | 199 | 25.5 |
| III | 63 | 11.0 | 61 | 8.8 | 84 | 11.7 | 85 | 12.2 | 87 | 11.1 |
| IV | 11 | 1.9 | 23 | 3.3 | 21 | 2.9 | 19 | 2.7 | 22 | 2.8 |
| X | 64 | 11.2 | 45 | 6.5 | 34 | 4.7 | 25 | 3.6 | 36 | 4.6 |
| TNM not applicable or relapse* | 25 | — | 24 | — | 21 | — | 19 | — | 18 | — |
| Pathological stage | | | | | | | | | | |
| 0 | 12 | 2.5 | 18 | 3.1 | 35 | 6.0 | 24 | 4.4 | 37 | 5.9 |
| I | 115 | 24.4 | 163 | 27.9 | 159 | 27.1 | 129 | 23.8 | 177 | 28.4 |
| II | 155 | 32.8 | 200 | 34.2 | 207 | 35.3 | 192 | 35.5 | 194 | 31.1 |
| III | 157 | 33.3 | 163 | 27.9 | 165 | 28.2 | 179 | 33.1 | 193 | 30.9 |
| IV | 17 | 3.6 | 28 | 4.8 | 16 | 2.7 | 11 | 2.0 | 14 | 2.2 |
| X | 16 | 3.4 | 12 | 2.1 | 4 | 0.7 | 6 | 1.1 | 9 | 1.4 |
| TNM not applicable or relapse* | 20 | — | 19 | — | 18 | — | 18 | — | 14 | — |
| Neoadjuvant treatment [†] | 106 | — | 118 | — | 135 | — | 157 | — | 161 | — |
| yPathological stage | | | | | | | | | | |
| 0 | 3 | 3.0 | 4 | 3.5 | 5 | 3.8 | 5 | 3.2 | 9 | 5.7 |
| I | 42 | 41.6 | 28 | 24.8 | 43 | 32.6 | 51 | 32.7 | 58 | 36.9 |
| II | 28 | 27.7 | 45 | 39.8 | 46 | 34.8 | 53 | 34.0 | 50 | 31.8 |
| III | 25 | 24.8 | 28 | 24.8 | 30 | 22.7 | 36 | 23.1 | 29 | 18.5 |
| IV | 2 | 2.0 | 8 | 7.1 | 8 | 6.1 | 9 | 5.8 | 10 | 6.4 |
| X | 1 | 1.0 | 0 | 0.0 | 0 | 0.0 | 2 | 1.3 | 1 | 0.6 |
| TNM not applicable or relapse* | 5 | — | 5 | — | 3 | — | 1 | — | 4 | — |
| No neoadjuvant treatment | 492 | — | 603 | — | 604 | — | 559 | — | 638 | — |
| Type of first diagnostic method | | | | | | | | | | |
| CT | 359 | 60.0 | 438 | 60.7 | 442 | 59.8 | 462 | 64.6 | 534 | 66.8 |
| ERCP | 19 | 3.2 | 25 | 3.5 | 26 | 3.5 | 24 | 3.4 | 25 | 3.1 |

| Characteristic | Belgium | | | | | | | | | |
|---|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| EUS | 99 | 16.6 | 98 | 13.6 | 97 | 13.1 | 63 | 8.8 | 75 | 9.4 |
| MRI | 98 | 16.4 | 122 | 16.9 | 145 | 19.6 | 139 | 19.4 | 134 | 16.8 |
| PET | 1 | 0.2 | 6 | 0.8 | 5 | 0.7 | 6 | 0.8 | 1 | 0.1 |
| PET/CT | 18 | 3.0 | 27 | 3.7 | 22 | 3.0 | 20 | 2.8 | 28 | 3.5 |
| Surgery | 4 | 0.7 | 5 | 0.7 | 2 | 0.3 | 1 | 0.1 | 2 | 0.3 |
| Missing | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 |
| Method to obtain first tissue sample for APO | | | | | | | | | | |
| CT | 5 | 0.8 | 7 | 1.0 | 3 | 0.4 | 9 | 1.3 | 4 | 0.5 |
| ERCP | 66 | 11.1 | 81 | 11.2 | 65 | 8.8 | 50 | 7.0 | 49 | 6.1 |
| EUS | 336 | 56.3 | 359 | 49.8 | 390 | 52.8 | 402 | 56.2 | 428 | 53.6 |
| MRI | 6 | 1.0 | 4 | 0.6 | 5 | 0.7 | 2 | 0.3 | 0 | 0.0 |
| Surgery | 184 | 30.8 | 270 | 37.4 | 276 | 37.3 | 252 | 35.2 | 318 | 39.8 |
| Missing | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 |
| Prior surgery or other treatment ** | | | | | | | | | | |
| Prior abdominal surgery | 59 | 9.9 | 137 | 19.0 | 119 | 16.1 | 110 | 15.4 | 98 | 12.3 |
| Other treatment modality (that could affect the pancreas) | 66 | 11.0 | 101 | 14.0 | 109 | 14.7 | 121 | 16.9 | 143 | 17.9 |
| Neoadjuvant treatment | | | | | | | | | | |
| Chemotherapy | 89 | 14.9 | 107 | 14.8 | 120 | 16.2 | 140 | 19.6 | 129 | 16.1 |
| Radiotherapy | 0 | 0.0 | 1 | 0.1 | 1 | 0.1 | 1 | 0.1 | 1 | 0.1 |
| Chemoradiotherapy | 17 | 2.8 | 10 | 1.4 | 14 | 1.9 | 16 | 2.2 | 31 | 3.9 |
| No chemo or radiation treatment | 492 | 82.3 | 603 | 83.6 | 604 | 81.7 | 559 | 78.1 | 638 | 79.8 |
| Charlson Comorbidity Index | | | | | | | | | | |
| 0 | 263 | 44.0 | 272 | 37.7 | 304 | 41.1 | 278 | 38.8 | 344 | 43.1 |
| 1 | 129 | 21.6 | 162 | 22.5 | 189 | 25.6 | 192 | 26.8 | 190 | 23.8 |
| 2 | 88 | 14.7 | 121 | 16.8 | 139 | 18.8 | 113 | 15.8 | 115 | 14.4 |
| 3 | 46 | 7.7 | 72 | 10.0 | 53 | 7.2 | 63 | 8.8 | 67 | 8.4 |
| 4 | 26 | 4.3 | 43 | 6.0 | 26 | 3.5 | 36 | 5.0 | 43 | 5.4 |
| 5 | 14 | 2.3 | 19 | 2.6 | 11 | 1.5 | 16 | 2.2 | 16 | 2.0 |
| 6 | 14 | 2.3 | 14 | 1.9 | 9 | 1.2 | 5 | 0.7 | 11 | 1.4 |
| 7 | 9 | 1.5 | 9 | 1.2 | 2 | 0.3 | 9 | 1.3 | 5 | 0.6 |
| 8 | 5 | 0.8 | 4 | 0.6 | 3 | 0.4 | 3 | 0.4 | 5 | 0.6 |
| 9 | 3 | 0.5 | 2 | 0.3 | 2 | 0.3 | 0 | 0.0 | 2 | 0.3 |
| 10 | 1 | 0.2 | 2 | 0.3 | 1 | 0.1 | 1 | 0.1 | 0 | 0.0 |
| 12 | 0 | 0.0 | 1 | 0.1 | 0 | 0.0 | 0 | 0.0 | 1 | 0.1 |
| WHO score at surgery | | | | | | | | | | |
| 0 - Asymptomatic, normal activity | 188 | 31.4 | 176 | 24.4 | 195 | 26.4 | 144 | 20.1 | 261 | 32.7 |
| 1 - Symptomatic, but ambulant | 347 | 58.0 | 462 | 64.1 | 447 | 60.5 | 491 | 68.6 | 456 | 57.1 |
| 2 - Symptomatic, bedbound < 50% day | 53 | 8.9 | 70 | 9.7 | 82 | 11.1 | 70 | 9.8 | 71 | 8.9 |
| 3 - Symptomatic, bedbound > 50% day | 9 | 1.5 | 12 | 1.7 | 15 | 2.0 | 11 | 1.5 | 11 | 1.4 |
| 4 - Completely dependent, 100% bedbound | 1 | 0.2 | 1 | 0.1 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| ASA score | | | | | | | | | | |
| 1 - Healthy person | 65 | 10.9 | 41 | 5.7 | 47 | 6.4 | 36 | 5.0 | 18 | 2.3 |

| Characteristic | Belgium | | | | | | | | | |
|--|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| 2 - Mild systemic disease, normal activity | 329 | 55.0 | 395 | 54.8 | 377 | 51.0 | 349 | 48.7 | 401 | 50.2 |
| 3 - Serious systemic disease, limited activity | 202 | 33.8 | 275 | 38.1 | 302 | 40.9 | 323 | 45.1 | 369 | 46.2 |
| 4 - Life-threatening illness, handicapped | 2 | 0.3 | 10 | 1.4 | 13 | 1.8 | 8 | 1.1 | 11 | 1.4 |
| Type of surgery | | | | | | | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 134 | 22.4 | 195 | 27.0 | 221 | 29.9 | 183 | 25.6 | 186 | 23.3 |
| Minimally invasive surgery (MIS) - Hybrid | 1 | 0.2 | 0 | 0.0 | 1 | 0.1 | 1 | 0.1 | 0 | 0.0 |
| Minimally invasive surgery (MIS) - Robotic | 11 | 1.8 | 58 | 8.0 | 66 | 8.9 | 91 | 12.7 | 157 | 19.6 |
| Open | 431 | 72.1 | 432 | 59.9 | 408 | 55.2 | 409 | 57.1 | 419 | 52.4 |
| Conversion from MIS to open surgery | 21 | 3.5 | 36 | 5.0 | 43 | 5.8 | 32 | 4.5 | 37 | 4.6 |
| Resectability status ** | | | | | | | | | | |
| Before neoadjuvant treatment | | | | | | | | | | |
| - Upfront resectable | _ | _ | 10 | 15.4 | 33 | 24.1 | 31 | 18.6 | 40 | 23.0 |
| - Borderline resectable | _ | _ | 41 | 63.1 | 75 | 54.7 | 112 | 67.1 | 95 | 54.6 |
| - Unresectable | _ | _ | 14 | 21.5 | 27 | 19.7 | 14 | 8.4 | 26 | 14.9 |
| - No neoadjuvant treatment | _ | _ | 342 | _ | 604 | _ | 559 | _ | 638 | _ |
| Before surgery | | | | | | | | | | |
| - Upfront resectable | _ | _ | 347 | 85.3 | 640 | 86.6 | 613 | 85.6 | 680 | 85.1 |
| - Borderline resectable | _ | _ | 53 | 13.0 | 93 | 12.6 | 99 | 13.8 | 107 | 13.4 |
| - Unresectable | _ | _ | 1 | 0.2 | 5 | 0.7 | 4 | 0.6 | 12 | 1.5 |
| - Missing | _ | _ | 6 | 1.5 | 1 | 0.1 | 0 | 0.0 | 0 | 0.0 |
| Simultaneous venous resection | | | | | | | | | | |
| No | 484 | 80.9 | 635 | 88.1 | 640 | 86.6 | 609 | 85.1 | 697 | 87.2 |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 114 | 19.1 | 86 | 11.9 | 99 | 13.4 | 107 | 14.9 | 102 | 12.8 |
| - With primary wedge-reconstruction | 36 | _ | 24 | _ | 27 | _ | 39 | _ | 37 | _ |
| - With primary end-to-end reconstruction | 42 | _ | 47 | _ | 55 | _ | 36 | _ | 30 | _ |
| - With vascular autograft interposition | 1 | _ | 3 | _ | 3 | _ | 4 | _ | 1 | _ |
| - With vascular allograft interposition | 9 | _ | 3 | _ | 8 | _ | 12 | _ | 28 | _ |
| - With synthetic/prosthetic interposition | 3 | _ | 1 | _ | 2 | _ | 1 | _ | 3 | _ |
| - With peritoneal patch wedge-reconstruction | 19 | _ | 8 | _ | 4 | _ | 9 | _ | 3 | _ |
| - Without reconstruction | 4 | _ | 0 | _ | 0 | _ | 6 | _ | 0 | _ |
| Simultaneous arterial resection ** | | | | | | | | | | |
| No | 580 | 97.0 | 711 | 98.6 | 722 | 97.7 | 701 | 97.9 | 789 | 98.7 |
| Hepatic artery resection | 5 | 0.8 | 7 | 1.0 | 6 | 0.8 | 7 | 1.0 | 3 | 0.4 |
| - With primary wedge-reconstruction | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With primary end-to-end reconstruction | 4 | _ | 4 | _ | 4 | _ | 4 | _ | 1 | _ |
| - With vascular autograft interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With vascular allograft interposition | 1 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With synthetic/prosthetic interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - Without reconstruction | 0 | _ | 3 | _ | 2 | _ | 3 | _ | 2 | _ |
| Coeliac trunk resection | 9 | 1.5 | 3 | 0.4 | 8 | 1.1 | 7 | 1.0 | 5 | 0.6 |
| - With primary wedge-reconstruction | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |

| Characteristic | Belgium | | | | | | | | | |
|---|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| - With primary end-to-end reconstruction | 0 | _ | 0 | _ | 1 | _ | 0 | _ | 1 | _ |
| - With vascular autograft interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With vascular allograft interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With synthetic/prosthetic interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - Without reconstruction | 9 | _ | 3 | _ | 7 | _ | 7 | _ | 4 | _ |
| Superior mesenteric artery (SMA) resection | 4 | 0.7 | 0 | 0.0 | 2 | 0.3 | 1 | 0.1 | 2 | 0.3 |
| - With primary wedge-reconstruction | 1 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With primary end-to-end reconstruction | 1 | _ | 0 | _ | 0 | _ | 0 | _ | 2 | _ |
| - With vascular autograft interposition | 0 | _ | 0 | _ | 2 | _ | 0 | _ | 0 | _ |
| - With vascular allograft interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - With synthetic/prosthetic interposition | 0 | _ | 0 | _ | 0 | _ | 0 | _ | 0 | _ |
| - Without reconstruction | 2 | _ | 0 | _ | 0 | _ | 1 | _ | 0 | _ |
| Simultaneous other organ resection ** | | | | | | | | | | |
| No | 383 | 64.0 | 458 | 63.5 | 426 | 57.6 | 436 | 60.9 | 455 | 56.9 |
| Colon | 29 | 4.8 | 13 | 1.8 | 11 | 1.5 | 22 | 3.1 | 27 | 3.4 |
| Stomach | 54 | 9.0 | 112 | 15.5 | 152 | 20.6 | 124 | 17.3 | 120 | 15.0 |
| Adrenal gland | 14 | 2.3 | 14 | 1.9 | 17 | 2.3 | 17 | 2.4 | 24 | 3.0 |
| Spleen | 96 | 16.1 | 139 | 19.3 | 157 | 21.2 | 149 | 20.8 | 215 | 26.9 |
| Other | 88 | 14.7 | 34 | 4.7 | 27 | 3.7 | 27 | 3.8 | 59 | 7.4 |
| RIZIV code for complex surgery | | | | | | | | | | |
| 242830-242841: Pancreaticoduodenectomy | 459 | 76.8 | 499 | 69.2 | 513 | 69.4 | 498 | 69.6 | 516 | 64.6 |
| Pancreaticoduodenectomy | 422 | 91.9 | 462 | 92.6 | 474 | 92.4 | 453 | 91.0 | 460 | 89.1 |
| Total Pancreatectomy | 37 | 8.1 | 37 | 7.4 | 39 | 7.6 | 45 | 9.0 | 56 | 10.9 |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 43 | 7.2 | 70 | 9.7 | 55 | 7.4 | 82 | 11.5 | 57 | 7.1 |
| 242874-242885: Hemipancreatectomy left | 88 | 14.7 | 142 | 19.7 | 160 | 21.7 | 130 | 18.2 | 214 | 26.8 |
| 242896-242900: Enucleation of a pancreatic tumour | 8 | 1.3 | 10 | 1.4 | 11 | 1.5 | 6 | 0.8 | 12 | 1.5 |
| Antithrombotic medication | | | | | | | | | | |
| No | 419 | 70.1 | 503 | 69.8 | 531 | 71.9 | 505 | 70.5 | 552 | 69.1 |
| Yes | 179 | 29.9 | 218 | 30.2 | 208 | 28.1 | 211 | 29.5 | 247 | 30.9 |
| Was the patient referred? | | | | | | | | | | |
| No | 270 | 45.2 | 307 | 42.6 | 322 | 43.6 | 290 | 40.5 | 365 | 45.7 |
| Yes | 328 | 54.8 | 414 | 57.4 | 417 | 56.4 | 426 | 59.5 | 434 | 54.3 |

* Tumour staging not possible.

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

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

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

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

| Characteristic | Belgium | | | | | | | | | |
|---|------------|------|------------|------|------------|------|------------|------|------------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Patients with surgery | 126 | | 135 | | 112 | | 118 | | 112 | |
| Expert centres | | | | | | | | | | |
| S1 | 10 | 7.9 | 5 | 3.7 | 9 | 8.0 | 11 | 9.3 | 10 | 8.9 |
| S2 | 6 | 4.8 | 11 | 8.1 | 7 | 6.3 | 11 | 9.3 | 10 | 8.9 |
| S3 | 3 | 2.4 | 4 | 3.0 | 0 | 0.0 | 2 | 1.7 | 1 | 0.9 |
| S4 | 37 | 29.4 | 35 | 25.9 | 26 | 23.2 | 11 | 9.3 | 16 | 14.3 |
| S5 | 2 | 1.6 | 8 | 5.9 | 3 | 2.7 | 6 | 5.1 | 4 | 3.6 |
| S6 | 11 | 8.7 | 6 | 4.4 | 10 | 8.9 | 10 | 8.5 | 7 | 6.3 |
| S7 | 9 | 7.1 | 19 | 14.1 | 6 | 5.4 | 15 | 12.7 | 8 | 7.1 |
| S8 | 5 | 4.0 | 8 | 5.9 | 5 | 4.5 | 6 | 5.1 | 3 | 2.7 |
| S9 | 18 | 14.3 | 11 | 8.1 | 13 | 11.6 | 19 | 16.1 | 13 | 11.6 |
| S10 | 5 | 4.0 | 4 | 3.0 | 8 | 7.1 | 2 | 1.7 | 8 | 7.1 |
| S11 | 4 | 3.2 | 2 | 1.5 | 4 | 3.6 | 4 | 3.4 | 2 | 1.8 |
| S12 | 6 | 4.8 | 11 | 8.1 | 9 | 8.0 | 9 | 7.6 | 8 | 7.1 |
| S13 | 3 | 2.4 | 4 | 3.0 | 5 | 4.5 | 3 | 2.5 | 2 | 1.8 |
| S14 | 4 | 3.2 | 6 | 4.4 | 4 | 3.6 | 6 | 5.1 | 19 | 17.0 |
| S15 | 3 | 2.4 | 1 | 0.7 | 3 | 2.7 | 3 | 2.5 | 1 | 0.9 |
| Sex | | | | | | | | | | |
| Male | 67 | 53.2 | 70 | 51.9 | 48 | 42.9 | 50 | 42.4 | 58 | 51.8 |
| Female | 59 | 46.8 | 65 | 48.1 | 64 | 57.1 | 68 | 57.6 | 54 | 48.2 |
| Age at surgery | | | | | | | | | | |
| <=69 | 81 | 64.3 | 82 | 60.7 | 75 | 67.0 | 65 | 55.1 | 65 | 58.0 |
| 70-79 | 42 | 33.3 | 46 | 34.1 | 31 | 27.7 | 48 | 40.7 | 38 | 33.9 |
| >=80 | 3 | 2.4 | 7 | 5.2 | 6 | 5.4 | 5 | 4.2 | 9 | 8.0 |
| Benign Tumoural Morphology | | | | | | | | | | |
| Adenoma | 11 | 8.7 | 4 | 3.0 | 9 | 8.0 | 8 | 6.8 | 8 | 7.1 |
| Cystadenoma | 26 | 20.6 | 31 | 23.0 | 31 | 27.7 | 26 | 22.0 | 21 | 18.8 |
| IPMN | 67 | 53.2 | 78 | 57.8 | 61 | 54.5 | 71 | 60.2 | 73 | 65.2 |
| Other benign | 22 | 17.5 | 22 | 16.3 | 11 | 9.8 | 13 | 11.0 | 10 | 8.9 |
| Prior surgery or other treatment ** | | | | | | | | | | |
| Prior abdominal surgery | 9 | 7.1 | 15 | 11.1 | 18 | 16.1 | 17 | 14.4 | 23 | 20.5 |
| Other treatment modality (that could affect the pancreas) | 1 | 0.8 | 2 | 1.5 | 3 | 2.7 | 5 | 4.2 | 7 | 6.3 |
| Charlson Comorbidity Index | | | | | | | | | | |
| 0 | 58 | 46.0 | 63 | 46.7 | 46 | 41.1 | 57 | 48.3 | 44 | 39.3 |
| 1 | 33 | 26.2 | 36 | 26.7 | 22 | 19.6 | 23 | 19.5 | 29 | 25.9 |
| 2 | 17 | 13.5 | 19 | 14.1 | 19 | 17.0 | 23 | 19.5 | 15 | 13.4 |
| 3 | 9 | 7.1 | 9 | 6.7 | 13 | 11.6 | 3 | 2.5 | 8 | 7.1 |
| 4 | 4 | 3.2 | 5 | 3.7 | 7 | 6.3 | 8 | 6.8 | 7 | 6.3 |

| Characteristic | Belgium | | | | | | | | | |
|---|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| 5 | 3 | 2.4 | 2 | 1.5 | 0 | 0.0 | 2 | 1.7 | 3 | 2.7 |
| 6 | 2 | 1.6 | 1 | 0.7 | 2 | 1.8 | 1 | 0.8 | 2 | 1.8 |
| 7 | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 2 | 1.8 |
| 8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.8 | 2 | 1.8 |
| 9 | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 |
| 11 | 0 | 0.0 | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 |
| WHO score at surgery | | | | | | | | | | |
| 0 - Asymptomatic, normal activity | 66 | 52.4 | 61 | 45.2 | 58 | 51.8 | 45 | 38.1 | 51 | 45.5 |
| 1 - Symptomatic, but ambulant | 55 | 43.7 | 64 | 47.4 | 46 | 41.1 | 67 | 56.8 | 53 | 47.3 |
| 2 - Symptomatic, bedbound < 50% day | 5 | 4.0 | 8 | 5.9 | 8 | 7.1 | 5 | 4.2 | 8 | 7.1 |
| 3 - Symptomatic, bedbound > 50% day | 0 | 0.0 | 2 | 1.5 | 0 | 0.0 | 1 | 0.8 | 0 | 0.0 |
| ASA score | | | | | | | | | | |
| 1 - Healthy person | 15 | 11.9 | 21 | 15.6 | 12 | 10.7 | 6 | 5.1 | 8 | 7.1 |
| 2 - Mild systemic disease, normal activity | 75 | 59.5 | 78 | 57.8 | 62 | 55.4 | 68 | 57.6 | 55 | 49.1 |
| 3 - Serious systemic disease, limited activity | 35 | 27.8 | 35 | 25.9 | 38 | 33.9 | 42 | 35.6 | 49 | 43.8 |
| 4 - Life-threatening illness, handicapped | 1 | 0.8 | 1 | 0.7 | 0 | 0.0 | 2 | 1.7 | 0 | 0.0 |
| Type of surgery | | | | | | | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 58 | 46.0 | 62 | 45.9 | 54 | 48.2 | 37 | 31.4 | 31 | 27.7 |
| Minimally invasive surgery (MIS) - Hybrid | 0 | 0.0 | 2 | 1.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Minimally invasive surgery (MIS) - Robotic | 7 | 5.6 | 12 | 8.9 | 20 | 17.9 | 25 | 21.2 | 41 | 36.6 |
| Open | 56 | 44.4 | 52 | 38.5 | 35 | 31.3 | 53 | 44.9 | 36 | 32.1 |
| Conversion from MIS to open surgery | 5 | 4.0 | 7 | 5.2 | 3 | 2.7 | 3 | 2.5 | 4 | 3.6 |
| Simultaneous vascular resection | | | | | | | | | | |
| No vascular reconstruction | 125 | 99.2 | 132 | 97.8 | 111 | 99.1 | 116 | 98.3 | 111 | 99.1 |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 1 | 0.8 | 3 | 2.2 | 1 | 0.9 | 2 | 1.7 | 1 | 0.9 |
| Simultaneous other organ resection | | | | | | | | | | |
| No | 82 | 65.1 | 88 | 65.2 | 76 | 67.9 | 74 | 62.7 | 63 | 56.3 |
| Colon | 0 | 0.0 | 3 | 2.2 | 0 | 0.0 | 2 | 1.7 | 0 | 0.0 |
| Stomach | 3 | 2.4 | 7 | 5.2 | 7 | 6.3 | 11 | 9.3 | 6 | 5.4 |
| Adrenal gland | 1 | 0.8 | 0 | 0.0 | 1 | 0.9 | 0 | 0.0 | 0 | 0.0 |
| Spleen | 30 | 23.8 | 40 | 29.6 | 29 | 25.9 | 33 | 28.0 | 44 | 39.3 |
| Other | 16 | 12.7 | 4 | 3.0 | 2 | 1.8 | 3 | 2.5 | 2 | 1.8 |
| RIZIV code for complex surgery | | | | | | | | | | |
| 242830-242841: Pancreaticoduodenectomy | 67 | 53.2 | 62 | 45.9 | 46 | 41.1 | 53 | 44.9 | 49 | 43.8 |
| Pancreaticoduodenectomy | 56 | 83.6 | 51 | 82.3 | 39 | 84.8 | 40 | 75.5 | 42 | 85.7 |
| Total Pancreatectomy | 11 | 16.4 | 11 | 17.7 | 7 | 15.2 | 13 | 24.5 | 7 | 14.3 |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 15 | 11.9 | 21 | 15.6 | 21 | 18.8 | 23 | 19.5 | 13 | 11.6 |
| 242874-242885: Hemipancreatectomy left | 41 | 32.5 | 47 | 34.8 | 39 | 34.8 | 40 | 33.9 | 49 | 43.8 |
| 242896-242900: Enucleation of a pancreatic tumour | 3 | 2.4 | 5 | 3.7 | 6 | 5.4 | 2 | 1.7 | 1 | 0.9 |

| | | Belgium | | | | | | | | | |
|---|--|---------|------|--------|------|--------|------|--------|------|--------|------|
| | | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| Characteristic | | N | % | N | % | N | % | N | % | N | % |
| <i>Antithrombotic medication</i> | | | | | | | | | | | |
| No | | 95 | 75.4 | 98 | 72.6 | 79 | 70.5 | 83 | 70.3 | 80 | 71.4 |
| Yes | | 31 | 24.6 | 37 | 27.4 | 33 | 29.5 | 35 | 29.7 | 32 | 28.6 |
| <i>Was the patient referred?</i> | | | | | | | | | | | |
| No | | 66 | 52.4 | 71 | 52.6 | 62 | 55.4 | 63 | 53.4 | 70 | 62.5 |
| Yes | | 60 | 47.6 | 64 | 47.4 | 50 | 44.6 | 55 | 46.6 | 42 | 37.5 |

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

3.1.2. Completeness of registration

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

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

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

| | Belgium, recognised centres | | |
|---|--------------------------------|----------------|------------|
| | n registered | N performed | n/N (%) |
| <i>Patients with surgery in Year 5</i> | 820 | 820 | 100.0 |
| <i>Expert centres</i> | | | |
| S1 | 82 | 82 | 100.0 |
| S2 | 29 | 29 | 100.0 |
| S3 | 26 | 26 | 100.0 |
| S4 | 160 | 160 | 100.0 |
| S5 | 38 | 38 | 100.0 |
| S6 | 93 | 93 | 100.0 |
| S7 | 39 | 39 | 100.0 |
| S8 | 51 | 51 | 100.0 |
| S9 | 78 | 78 | 100.0 |
| S10 | 15 | 15 | 100.0 |
| S11 | 29 | 29 | 100.0 |
| S12 | 44 | 44 | 100.0 |
| S13 | 35 | 35 | 100.0 |
| S14 | 53 | 53 | 100.0 |
| S15 | 27 | 27 | 100.0 |

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

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

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

| Patient group | Belgium | | |
|---|--------------|------------|---------|
| | N registered | n complete | n/N (%) |
| <i>Patients discussed on a MC expert in Year 5</i> | 2,291 | 2,281 | 99.6 |
| <i>Surgery status</i> | | | |
| Patients with surgery | 911 | 902 | 99.0 |
| Patients without surgery | 1,380 | 1,379 | 99.9 |
| <i>Expert centres</i> | | | |
| S1 | 179 | 178 | 99.4 |
| S2 | 111 | 111 | 100.0 |
| S3 | 97 | 97 | 100.0 |
| S4 | 335 | 333 | 99.4 |
| S5 | 138 | 134 | 97.1 |
| S6 | 247 | 246 | 99.6 |
| S7 | 155 | 155 | 100.0 |
| S8 | 160 | 160 | 100.0 |
| S9 | 144 | 143 | 99.3 |
| S10 | 91 | 91 | 100.0 |
| S11 | 34 | 34 | 100.0 |
| S12 | 126 | 126 | 100.0 |
| S13 | 146 | 146 | 100.0 |
| S14 | 240 | 239 | 99.6 |
| S15 | 88 | 88 | 100.0 |

3.2. Process indicators

3.2.1. Time between diagnosis and start of treatment

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

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

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

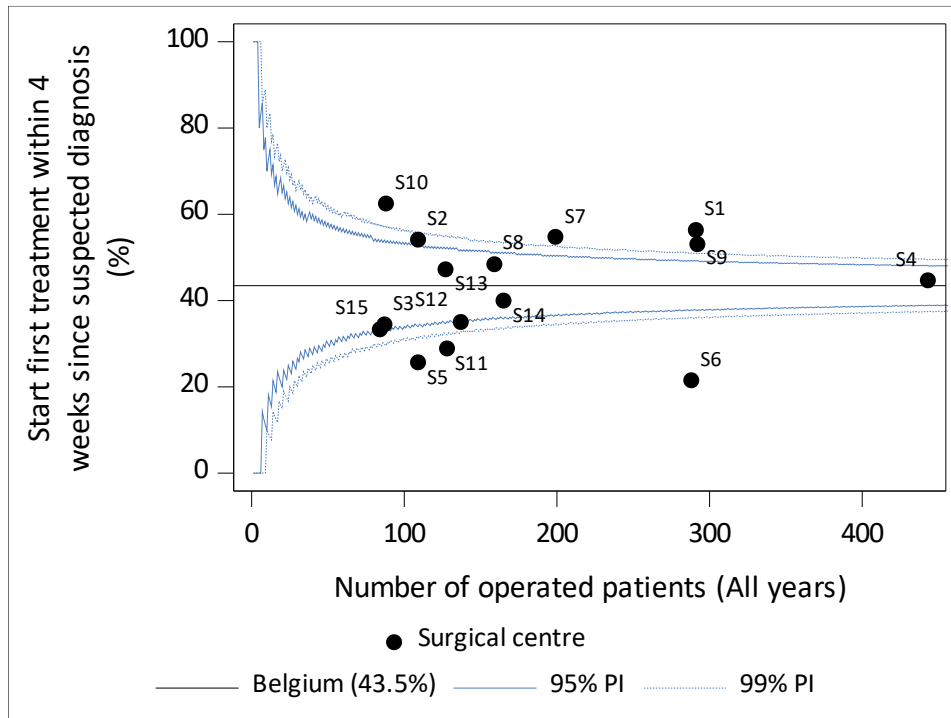
3.2.1.1. Time between suspected diagnosis and start of first treatment for patients with (suspected) adenocarcinoma

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

| Patient group | Belgium | | | |
|--|---------|-------|---------|--------------|
| | N | n | n/N (%) | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 1,176 | 43.5 | [41.6, 45.4] |
| Convention Year | | | | |
| Year 1 | 476 | 236 | 49.6 | [45.0, 54.2] |
| Year 2 | 554 | 245 | 44.2 | [40.0, 48.5] |
| Year 3 | 552 | 240 | 43.5 | [39.3, 47.7] |
| Year 4 | 545 | 236 | 43.3 | [39.1, 47.6] |
| Year 5 | 579 | 219 | 37.8 | [33.9, 41.9] |
| Referral status | | | | |
| Operated patients referred to an expert centre | 1,601 | 673 | 42.0 | [39.6, 44.5] |
| Operated patients without referral | 1,105 | 503 | 45.5 | [42.6, 48.5] |

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

(a)



(b)

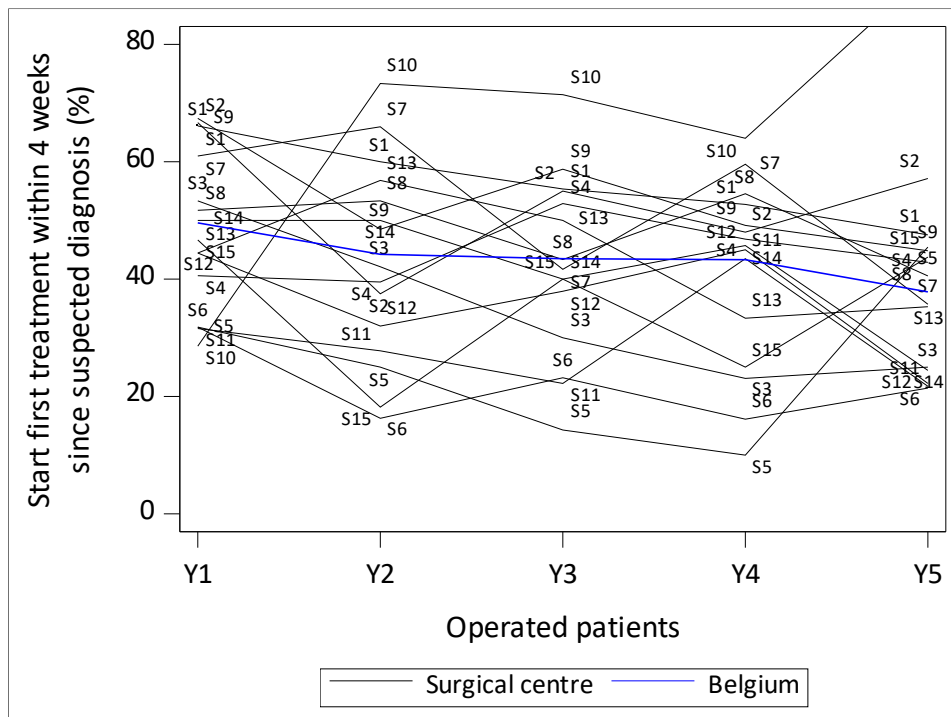
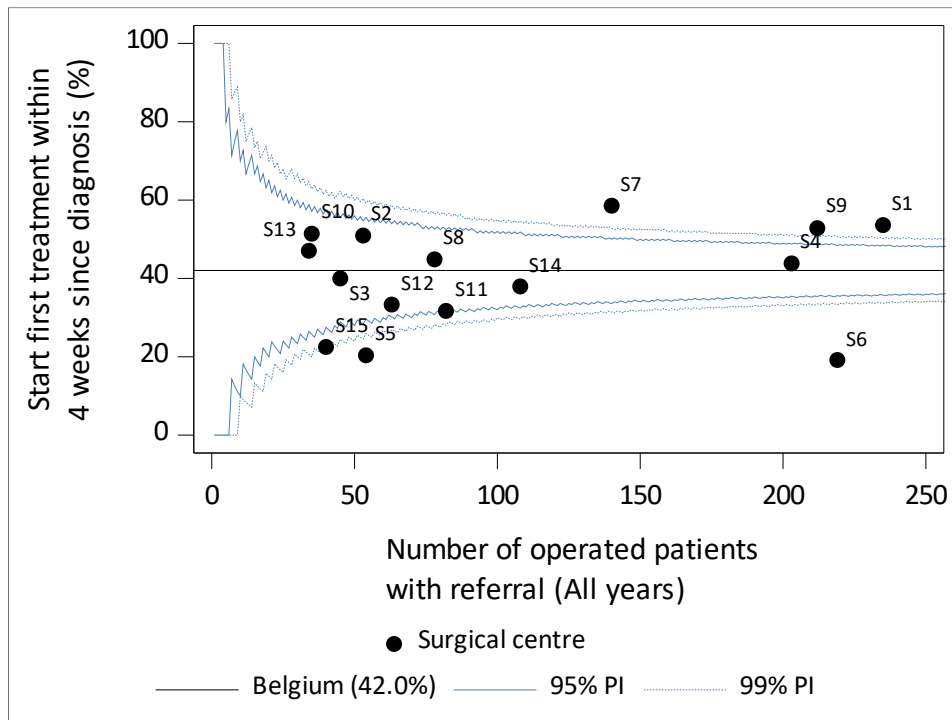


Figure 5: Funnel and spaghetti plot of the proportion of all operated patients referred to an expert centre with suspected adenocarcinoma for whom first treatment started within 4 weeks since suspected diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

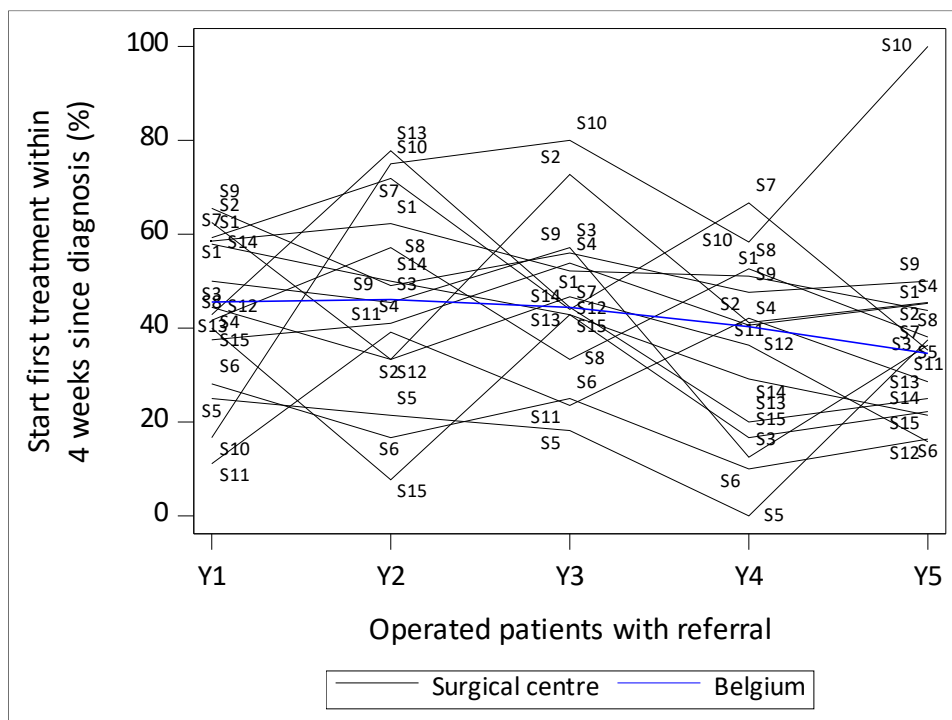
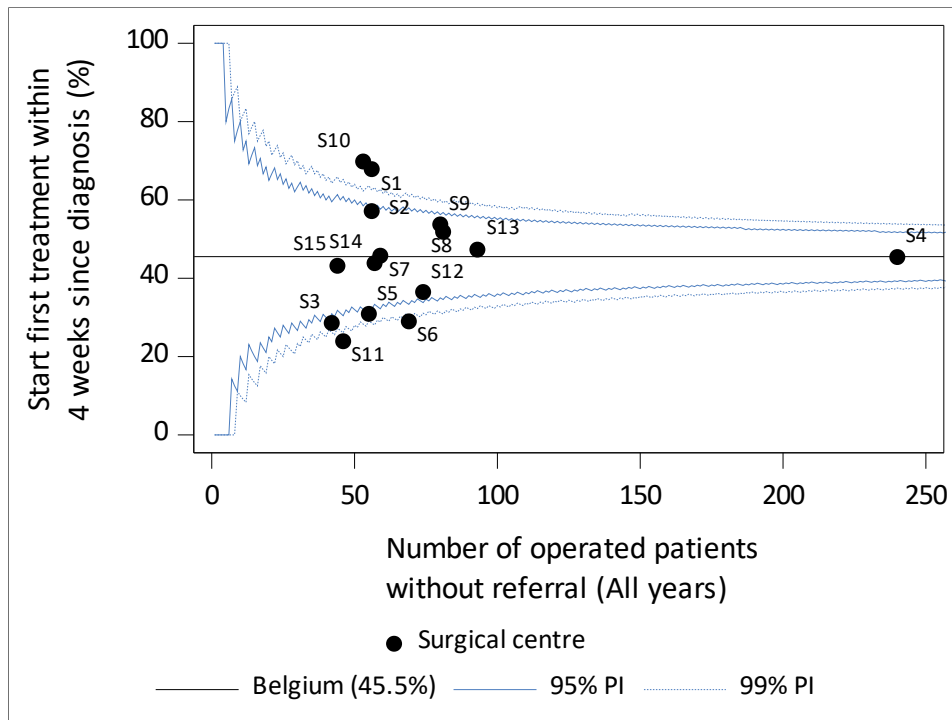


Figure 6: Funnel and spaghetti plot of the proportion of all operated patients **without referral** (= direct presentation at expert centre) with suspected **adenocarcinoma** for whom first treatment started within 4 weeks since **suspected** diagnosis, per centre, for (a) all years combined, (b) evolution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

(a)



(b)

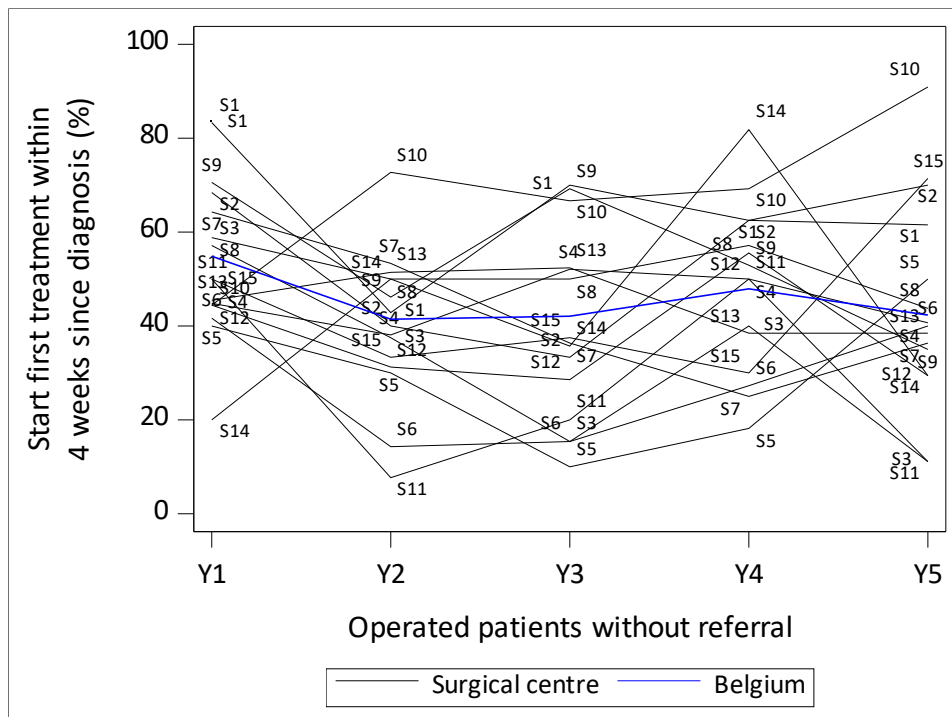
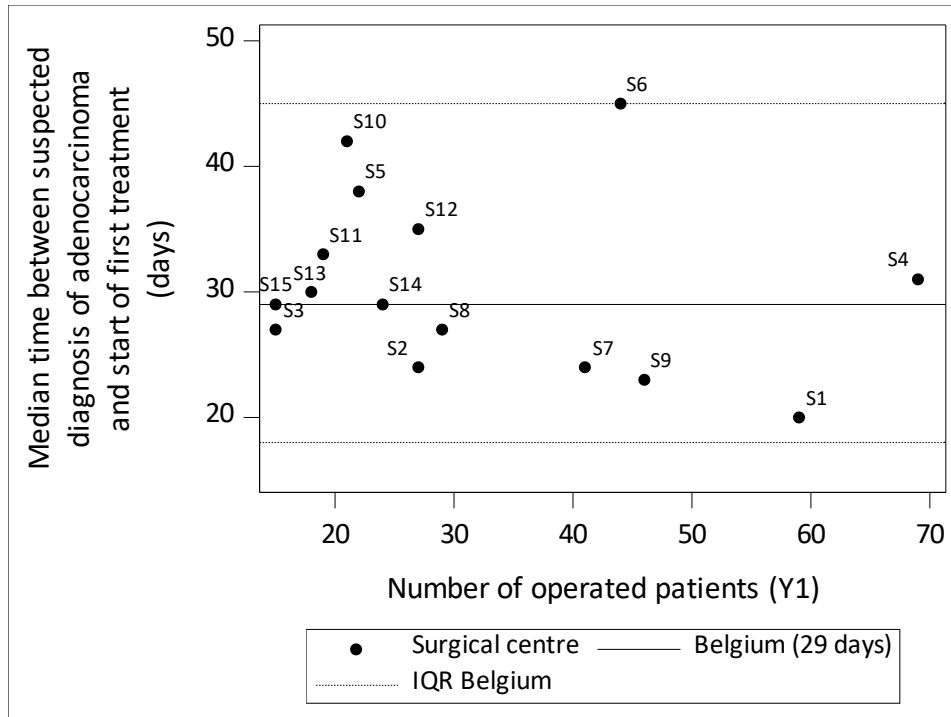


Table 7. Median time between **suspected** diagnosis of **adenocarcinoma** and start of first treatment in the five convention years.

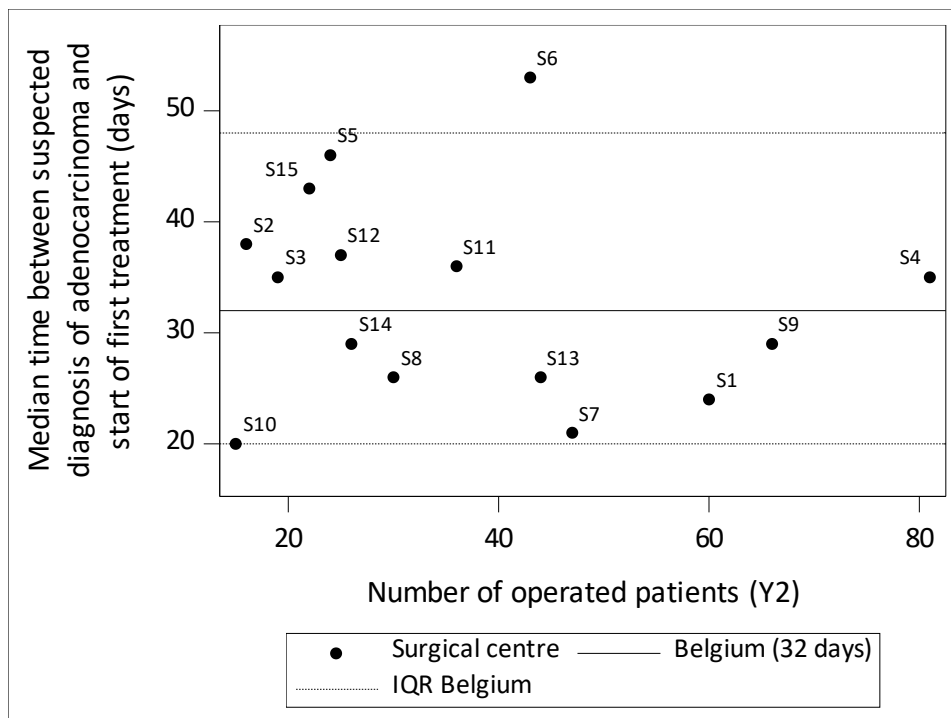
| Belgium | | | | |
|---|-------|---------------|----------|-------|
| Patient group | N | Median (days) | IQR* | p90** |
| <i>Operated patients with adenocarcinoma</i> | 2,706 | 32 | [20, 49] | 80 |
| <i>Convention year</i> | | | | |
| Year 1 | 476 | 29 | [18, 45] | 77 |
| Year 2 | 554 | 32 | [20, 48] | 84 |
| Year 3 | 552 | 33 | [20, 50] | 80 |
| Year 4 | 545 | 32 | [20, 47] | 77 |
| Year 5 | 579 | 35 | [23, 55] | 83 |
| <i>Referral status</i> | | | | |
| Operated patients referred to an expert centre | 1,601 | 33 | [21, 50] | 77 |
| Operated patients without referral | 1,105 | 31 | [19, 48] | 88 |
| * Interquartile Range= [the 25th, and 75th percentiles of the data] | | | | |
| ** 90th percentile | | | | |

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

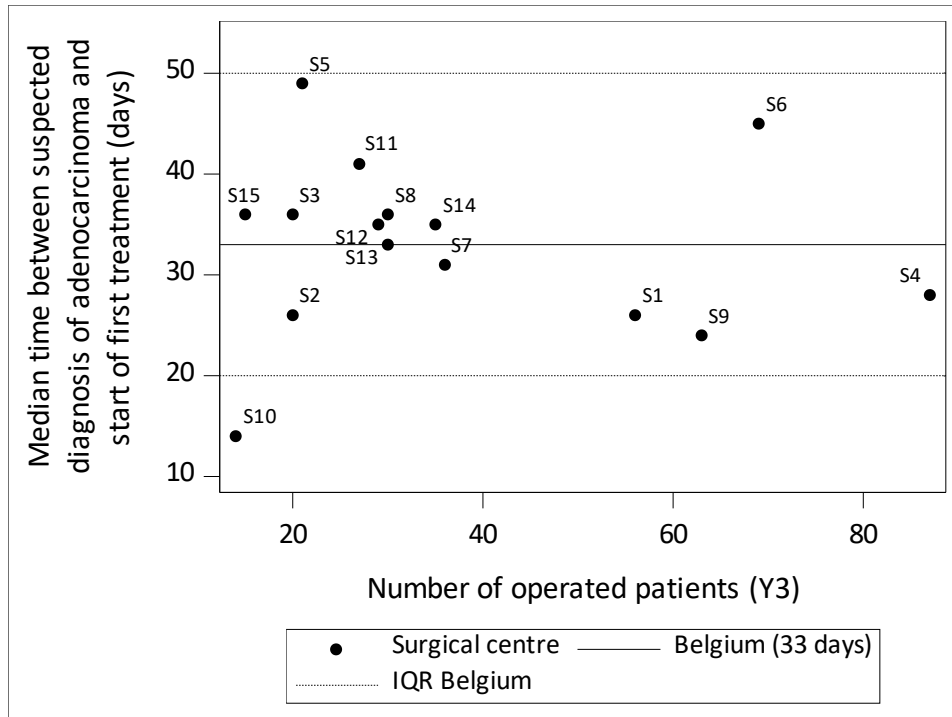
(a)



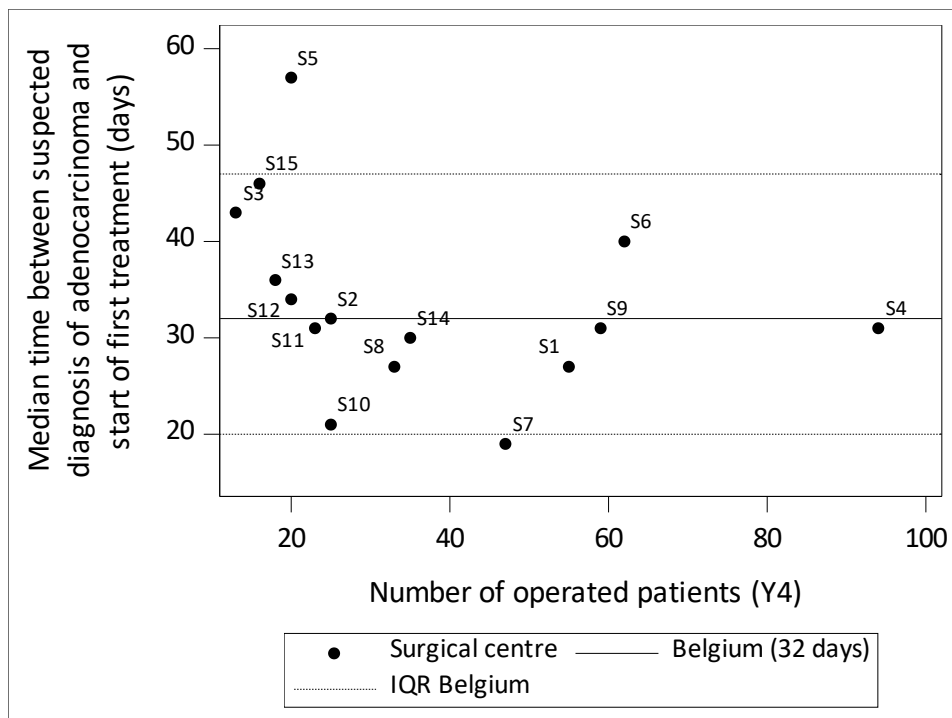
(b)



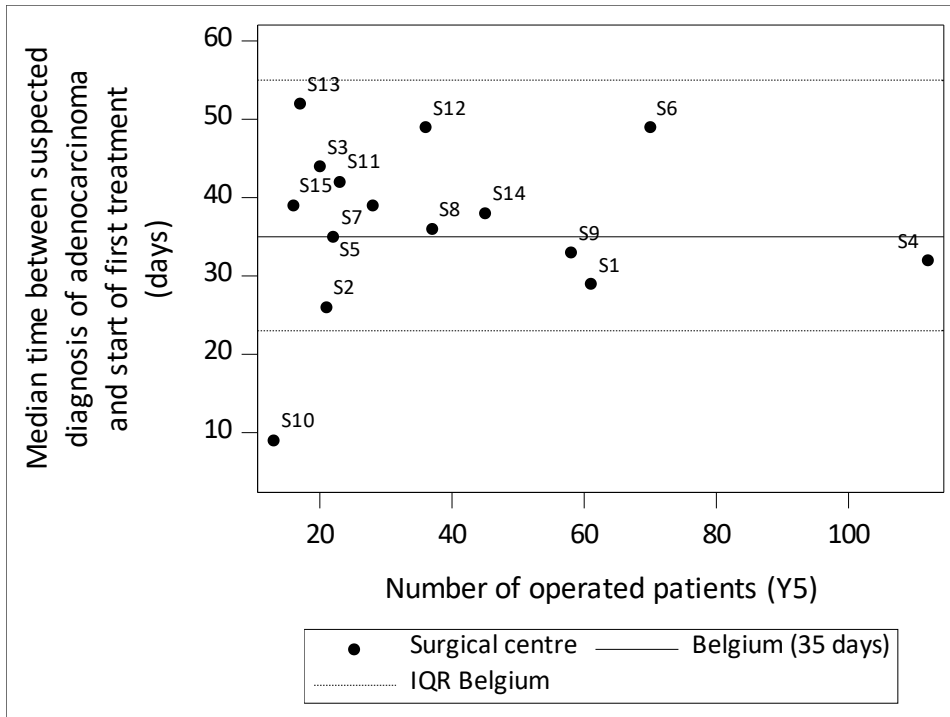
(c)



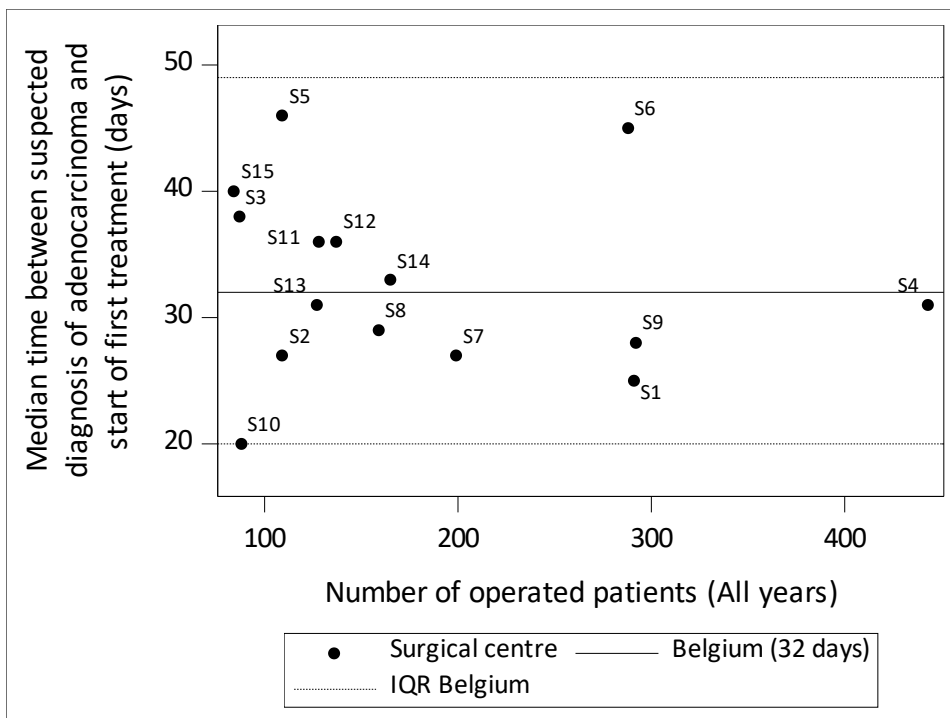
(d)



(e)



(f)



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

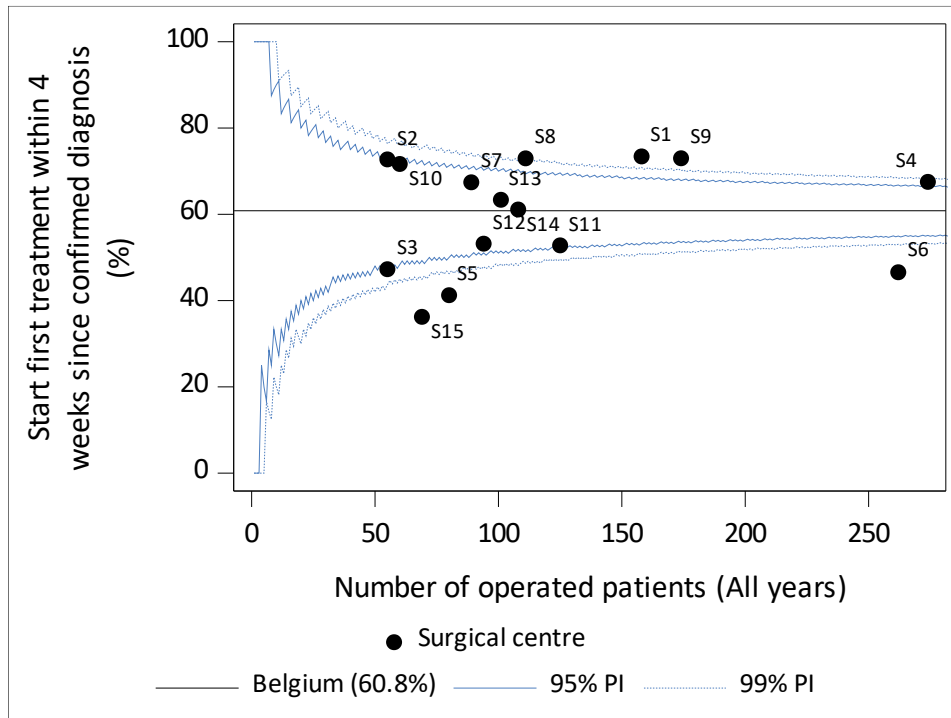
Table 8. Proportion of operated patients with **adenocarcinoma** in the five convention years for whom first treatment started within 4 weeks since **confirmed** diagnosis.

| Patient group | N | Belgium | | |
|--|-------|---------|---------|--------------|
| | | n | n/N (%) | 95% CI |
| Operated patients with confirmed adenocarcinoma | 1,815 | 1,104 | 60.8 | [58.5, 63.1] |
| Convention year | | | | |
| Year 1 | 336 | 225 | 67.0 | [61.7, 72.0] |
| Year 2 | 364 | 220 | 60.4 | [55.2, 65.5] |
| Year 3 | 367 | 202 | 55.0 | [49.8, 60.2] |
| Year 4 | 362 | 231 | 63.8 | [58.6, 68.8] |
| Year 5 | 386 | 226 | 58.5 | [53.5, 63.5] |
| Referral status | | | | |
| Operated patients referred to an expert centre | 1,088 | 637 | 58.5 | [55.6, 61.5] |
| Operated patients without referral | 727 | 467 | 64.2 | [60.6, 67.7] |

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

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

(a)



(b)

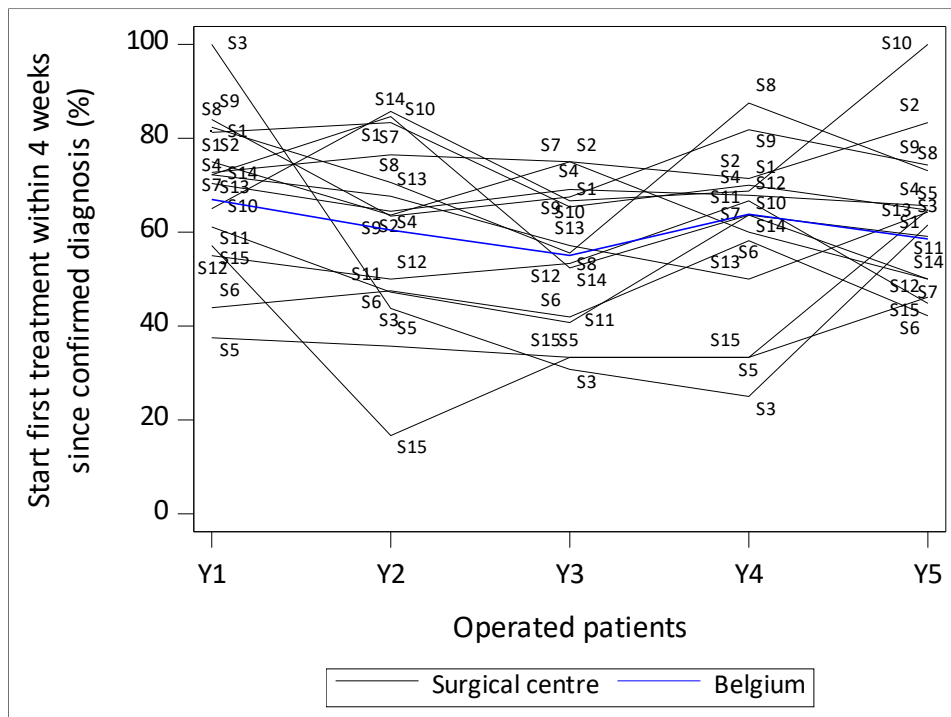
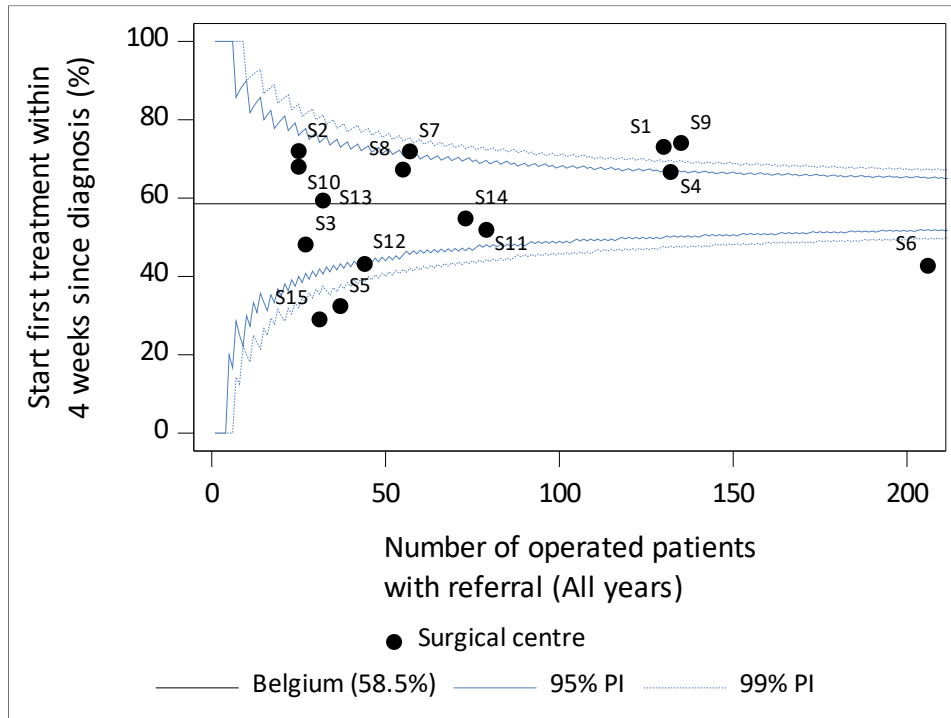


Figure 9: Funnel and spaghetti plot of the proportion of operated patients referred to an expert centre with adenocarcinoma for whom first treatment started within 4 weeks since confirmed diagnosis, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

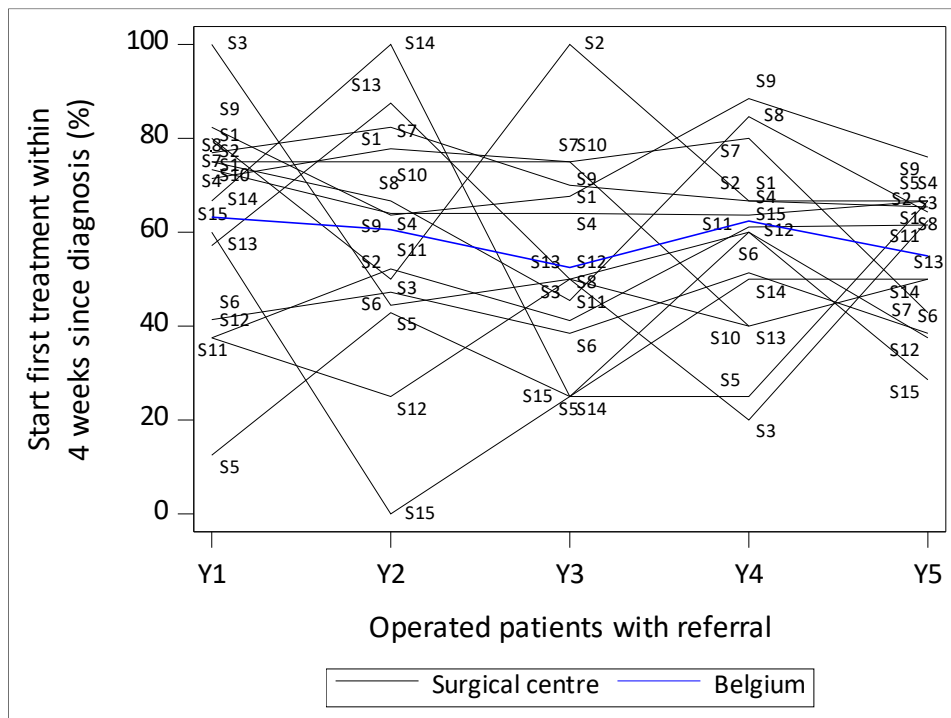
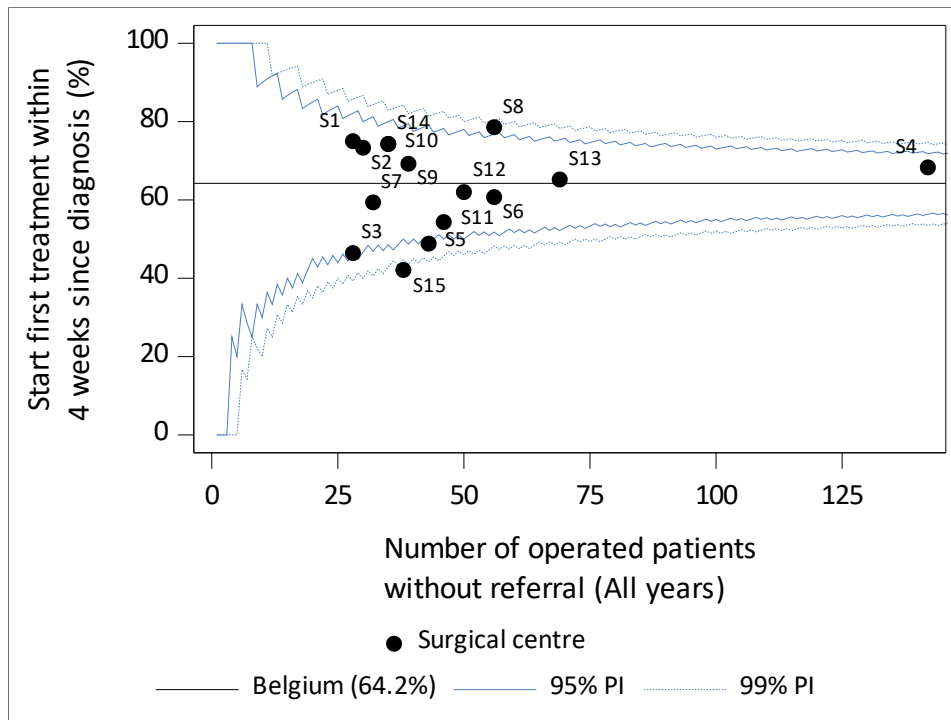


Figure 10: Funnel and spaghetti plot of the proportion of operated patients **without referral** (= direct presentation at expert centre) with **adenocarcinoma** for whom first treatment started within 4 weeks since **confirmed** diagnosis, per centre, for (a) all years combined, (b) evolution year 1,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

(a)



(b)

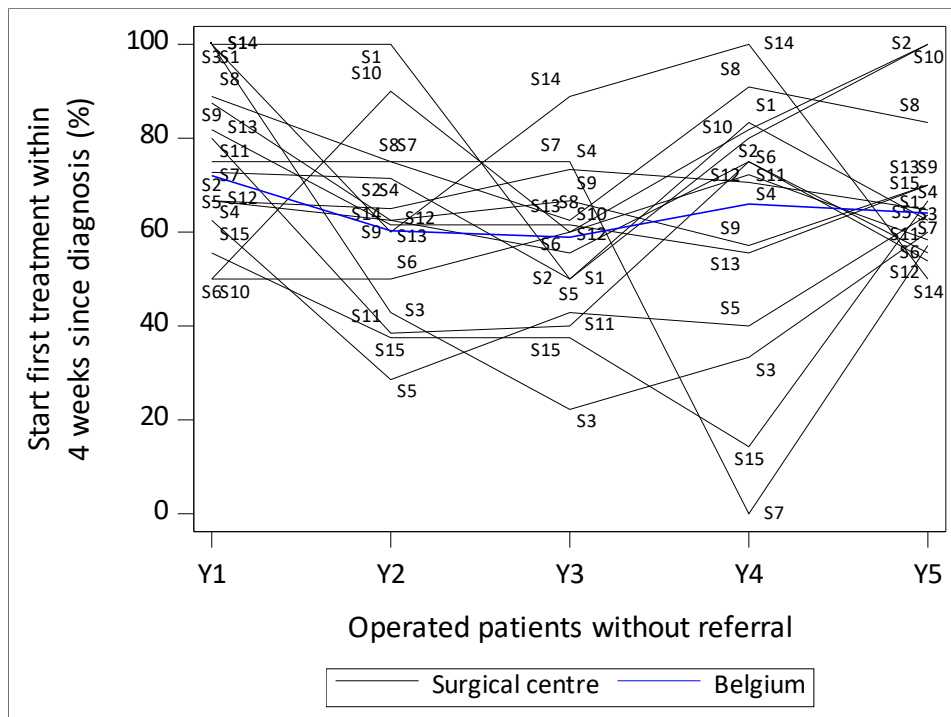


Table 9. Median time between **confirmed** diagnosis of **adenocarcinoma** and start of first treatment in the five convention years.

| Belgium | | | | |
|---|-------|---------------|----------|-------|
| Patient group | N | Median (days) | IQR* | p90** |
| <i>Operated patients with confirmed adenocarcinoma</i> | 1,815 | 25 | [14, 37] | 55 |
| <i>Convention year</i> | | | | |
| Year 1 | 336 | 21 | [12, 37] | 57 |
| Year 2 | 364 | 25 | [14, 36] | 56 |
| Year 3 | 367 | 27 | [15, 37] | 55 |
| Year 4 | 362 | 24 | [14, 35] | 50 |
| Year 5 | 386 | 26 | [18, 40] | 55 |
| <i>Referral status</i> | | | | |
| Operated patients referred to an expert centre | 1,088 | 25 | [15, 39] | 57 |
| Operated patients without referral | 727 | 23 | [14, 34] | 51 |

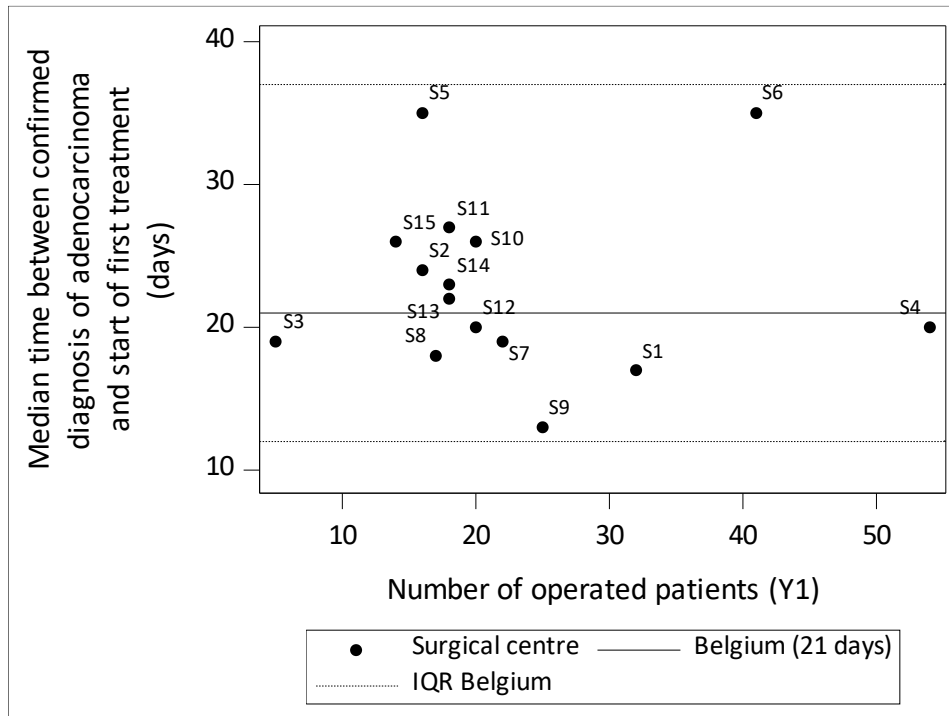
Remark: only operated patients with a histologically confirmed diagnosis are shown in this table.

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

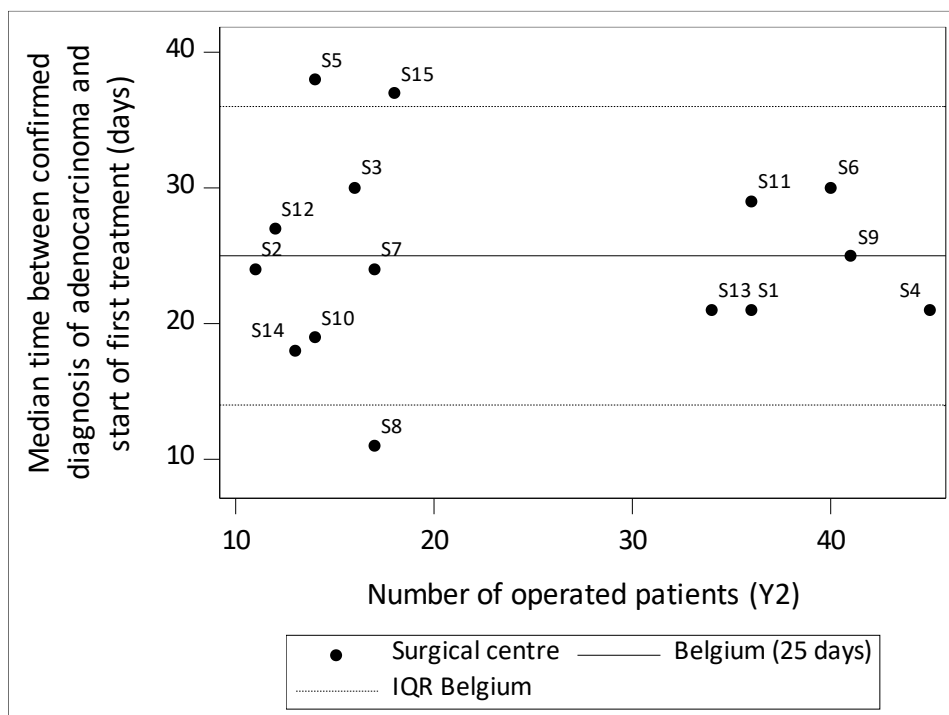
** 90th percentile

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

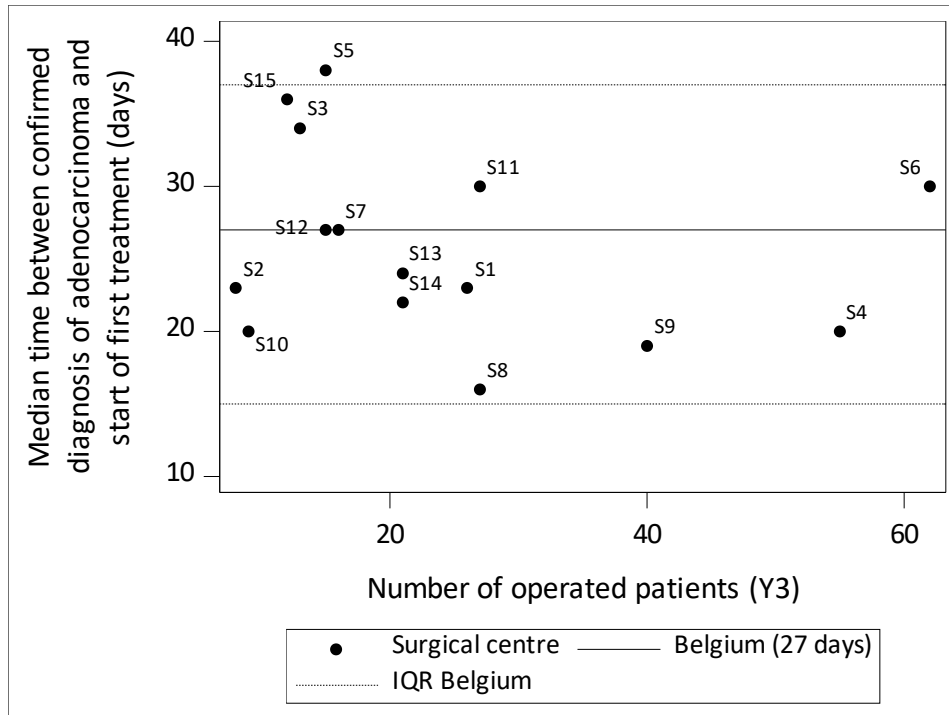
(a)



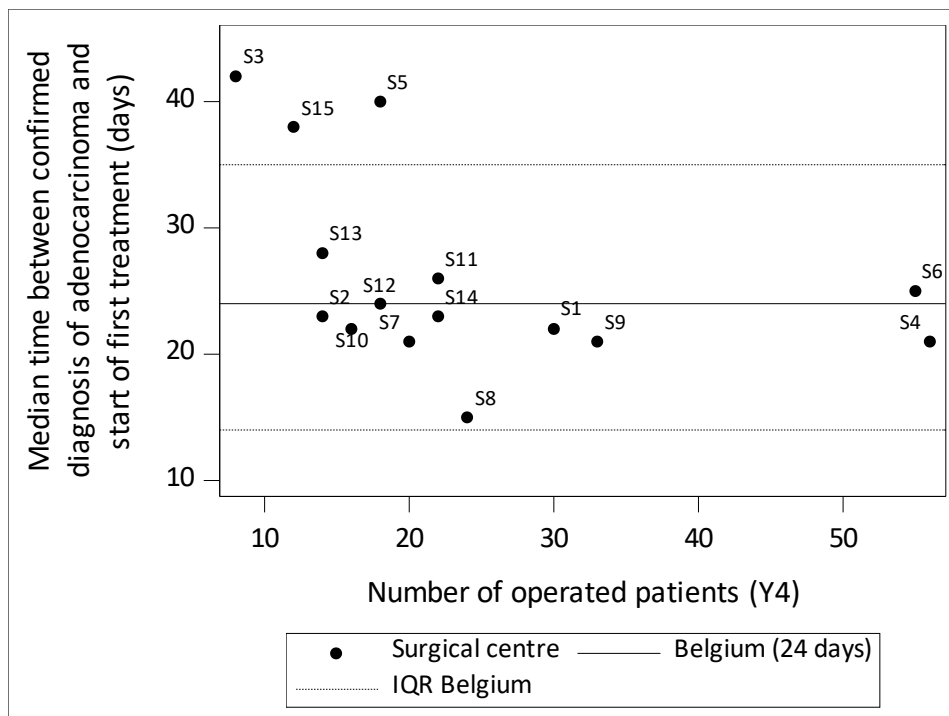
(b)



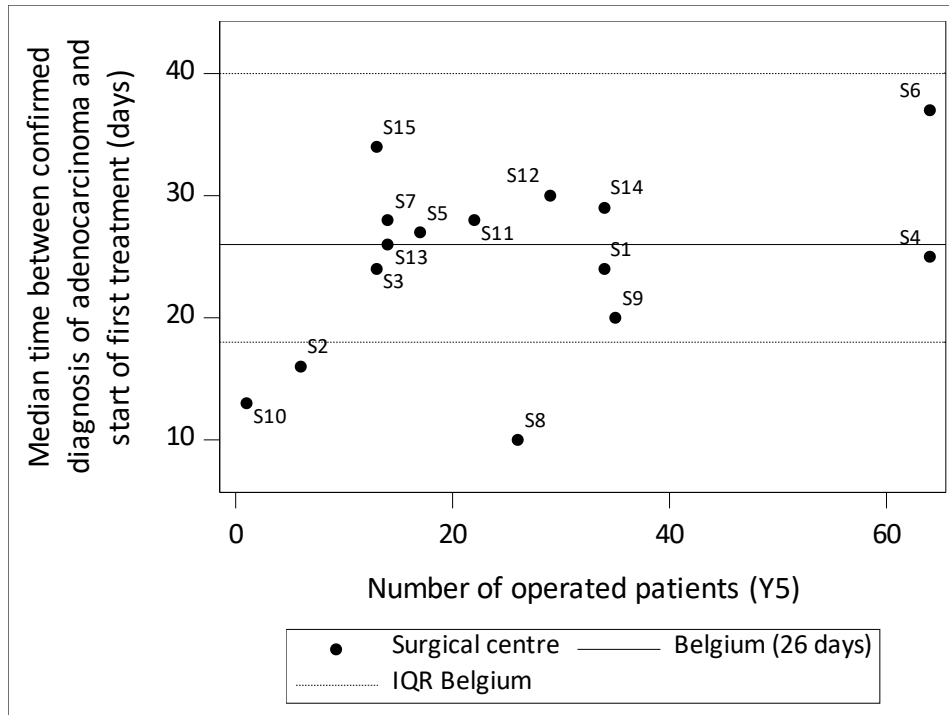
(c)



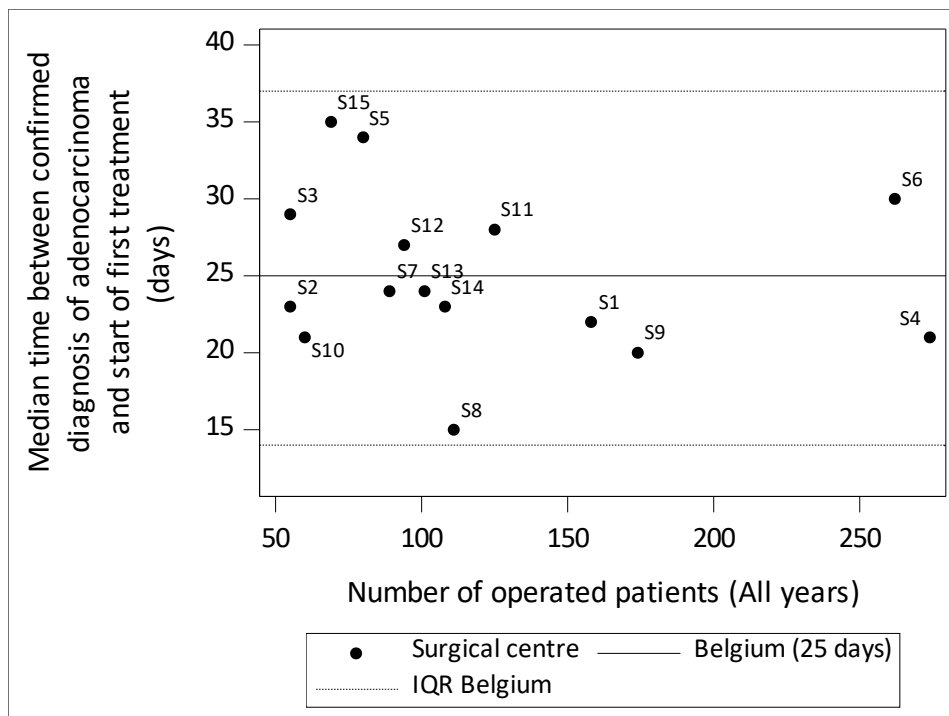
(d)



(e)



(f)



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

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

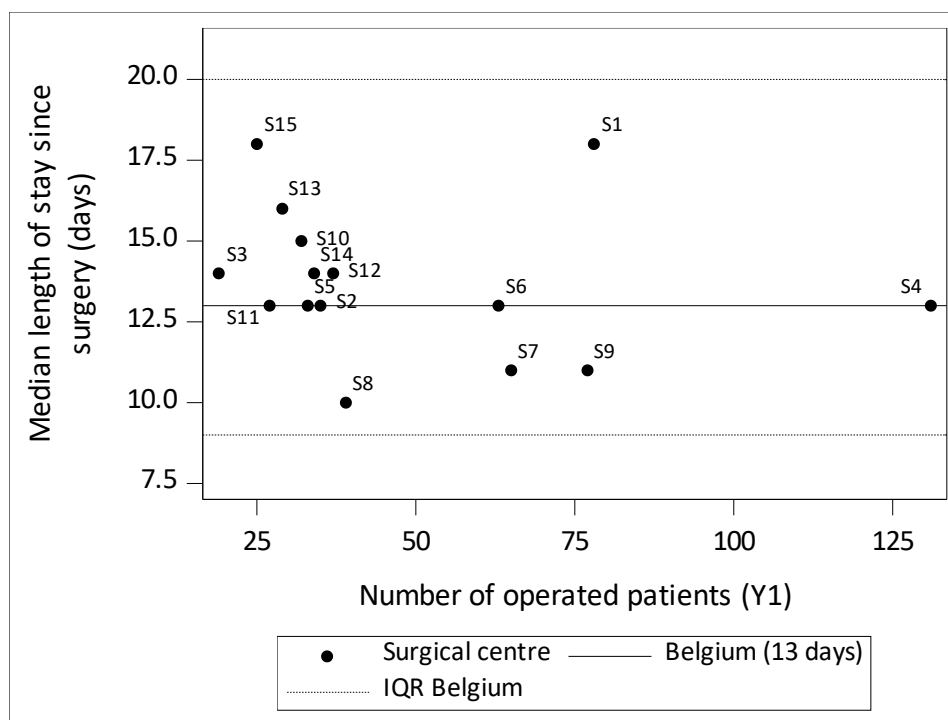
| Patient group | N | Belgium | |
|---|-------|---------------|----------|
| | | Median (days) | IQR* |
| Operated patients with malignant/benign tumours ¹ | 4,176 | 12 | [9, 18] |
| Type of surgery | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,762 | 14 | [10, 21] |
| Pancreaticoduodenectomy | 2,499 | 14 | [10, 21] |
| Total Pancreatectomy | 263 | 15 | [11, 21] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 400 | 10 | [8, 15] |
| 242874-242885: Hemipancreatectomy left | 950 | 8 | [7, 11] |
| 242896-242900: Enucleation of a pancreatic tumour | 64 | 8 | [6, 12] |
| Convention year | | | |
| Year 1 | 724 | 13 | [9, 20] |
| Year 2 | 856 | 12 | [9, 19] |
| Year 3 | 851 | 12 | [8, 17] |
| Year 4 | 834 | 12 | [8, 18] |
| Year 5 | 911 | 12 | [8, 18] |

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

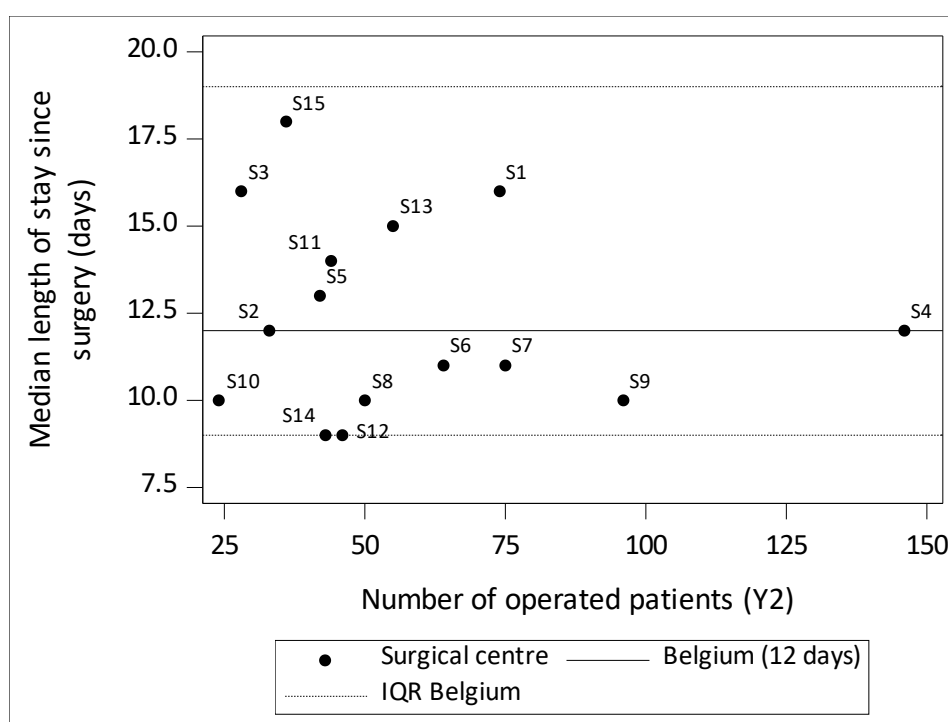
* Interquartile Range= [the 25th, and 75th percentiles of the data]

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

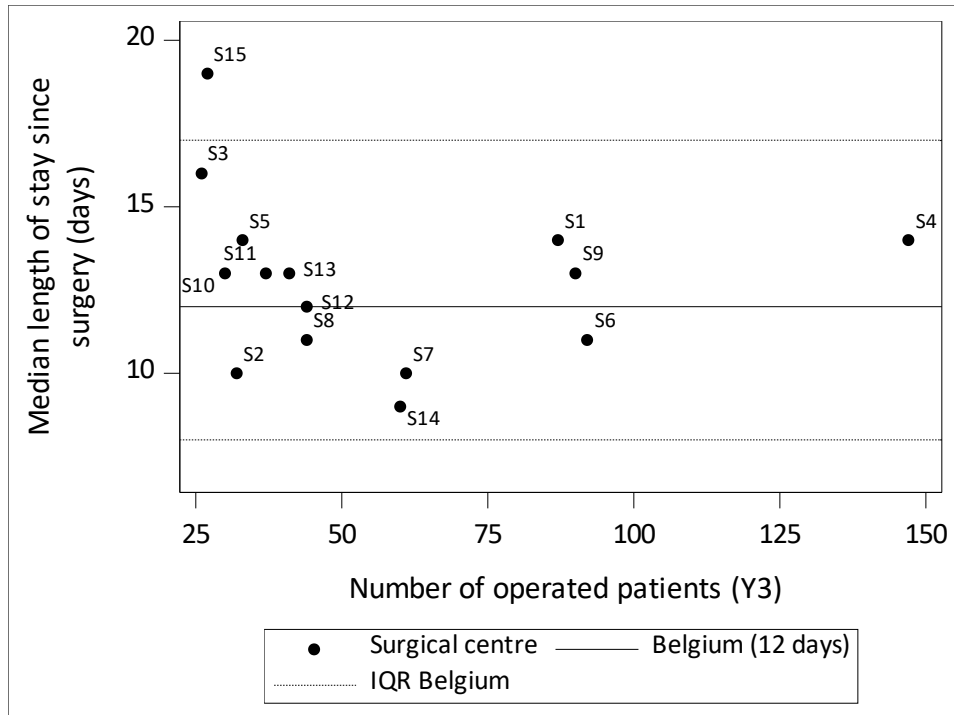
(a)



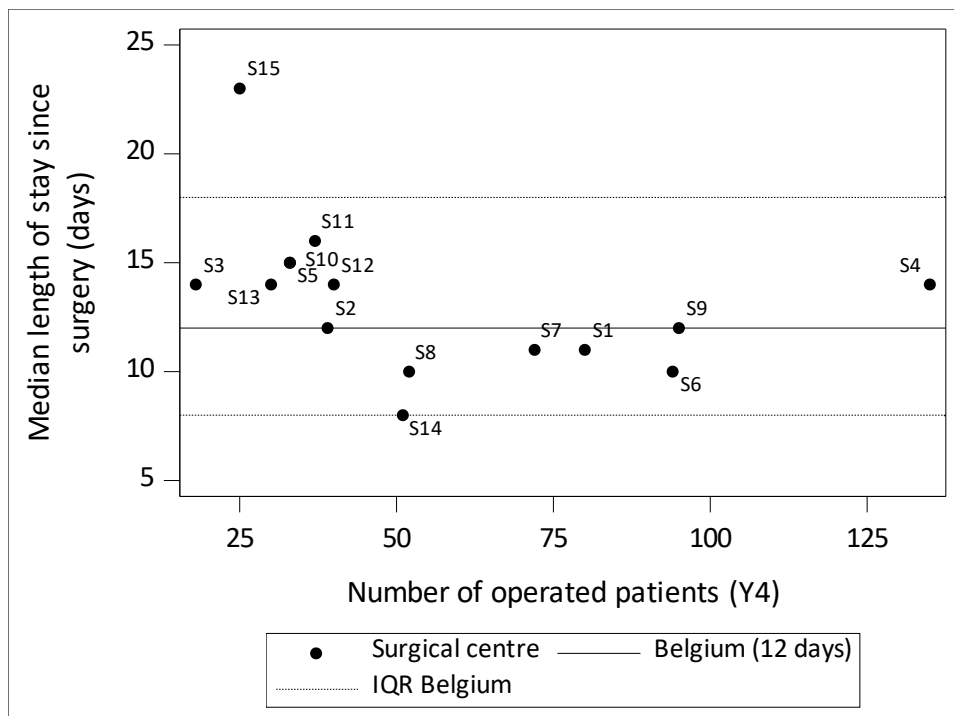
(b)



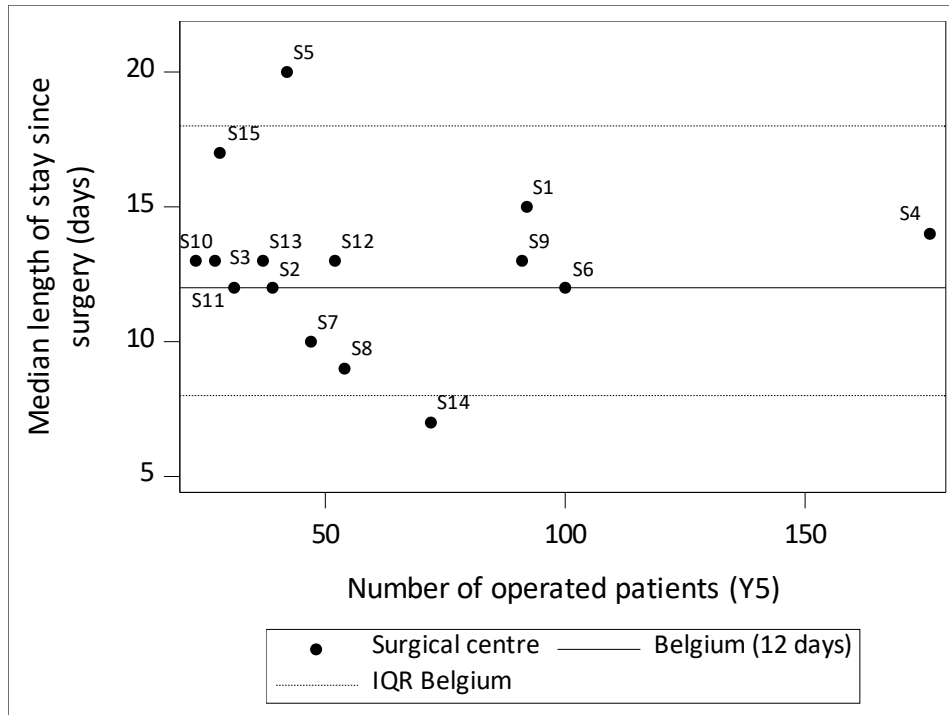
(c)



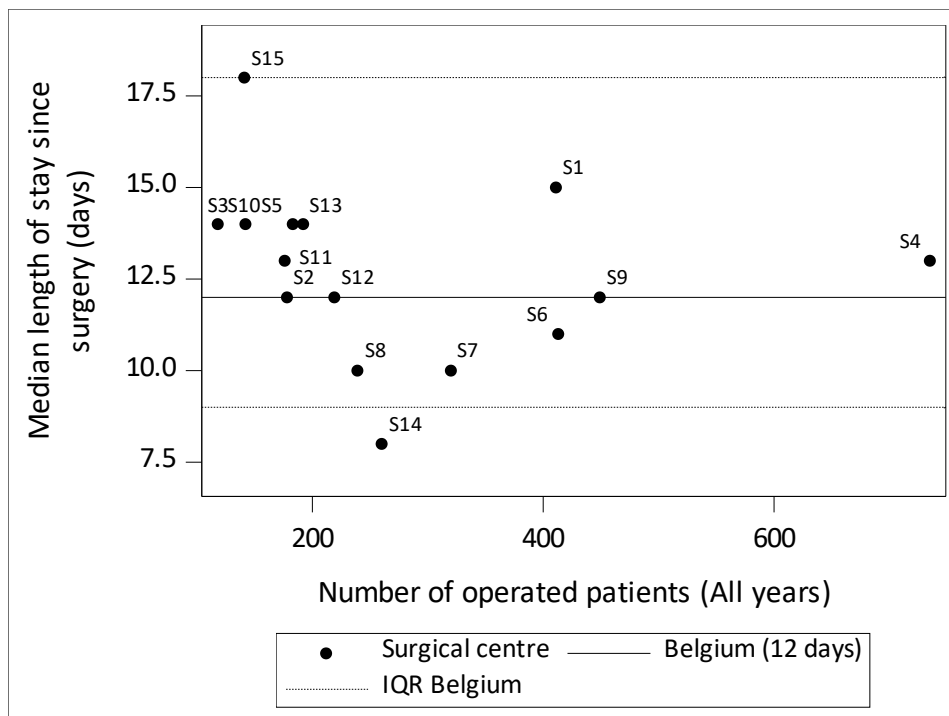
(d)



(e)



(f)



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

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

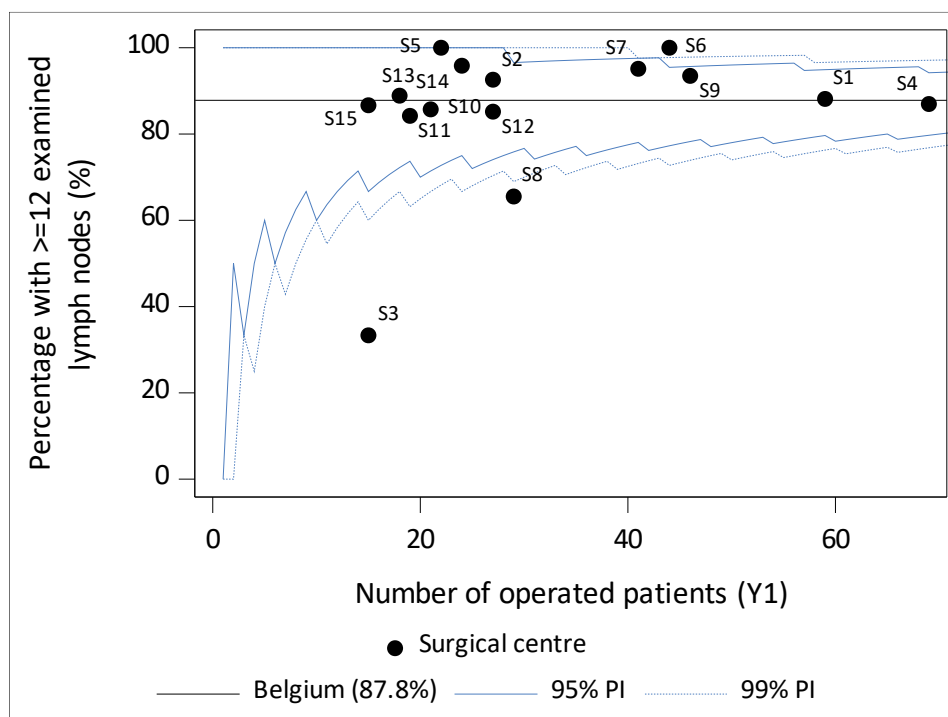
| Characteristic | Belgium | | | |
|---|---------|-------|---------|--------------|
| | N | n | n/N (%) | 95% CI |
| <i>Operated patients with a malignant tumour</i> | 3,573 | 2,912 | 81.5 | [80.2, 82.8] |
| <i>Malignant morphology</i> | | | | |
| Adenocarcinoma | 2,706 | 2,440 | 90.2 | [89.0, 91.3] |
| Neuroendocrine tumour | 535 | 248 | 46.4 | [42.1, 50.7] |
| Other or unspecified | 332 | 224 | 67.5 | [62.1, 72.5] |

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

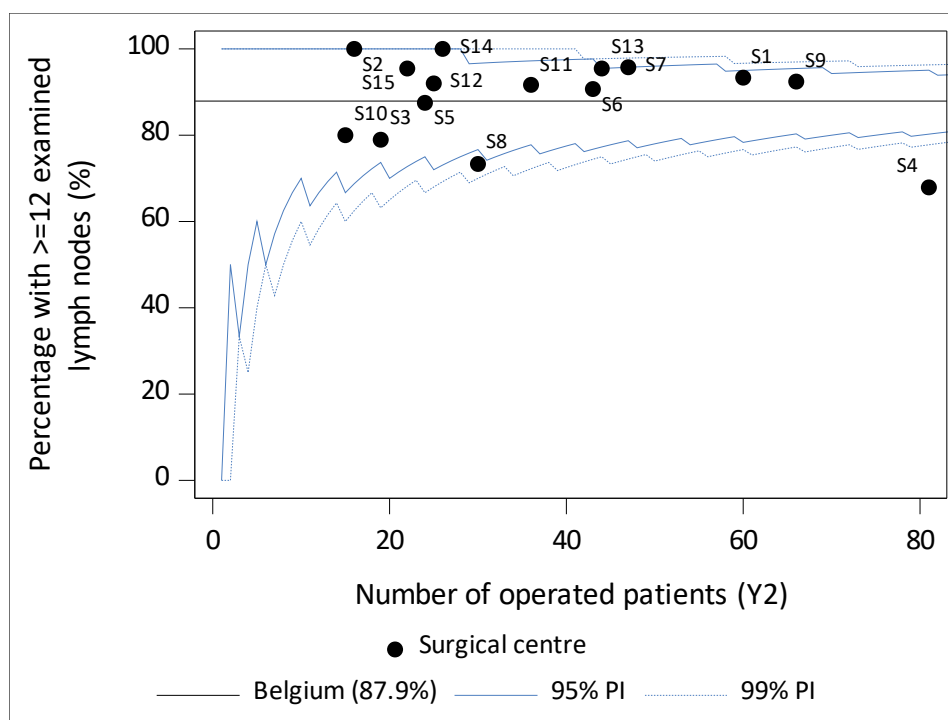
| Characteristic | Belgium | | | |
|---|---------|-------|---------|---------------|
| | N | n | n/N (%) | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 2,440 | 90.2 | [89.0, 91.3] |
| Expert centres | | | | |
| S1 | 291 | 275 | 94.5 | [91.2, 96.8] |
| S2 | 109 | 107 | 98.2 | [93.5, 99.8] |
| S3 | 87 | 58 | 66.7 | [55.7, 76.4] |
| S4 | 443 | 346 | 78.1 | [74.0, 81.9] |
| S5 | 109 | 102 | 93.6 | [87.2, 97.4] |
| S6 | 288 | 270 | 93.8 | [90.3, 96.3] |
| S7 | 199 | 190 | 95.5 | [91.6, 97.9] |
| S8 | 159 | 132 | 83.0 | [76.3, 88.5] |
| S9 | 292 | 279 | 95.5 | [92.5, 97.6] |
| S10 | 88 | 79 | 89.8 | [81.5, 95.2] |
| S11 | 128 | 119 | 93.0 | [87.1, 96.7] |
| S12 | 137 | 127 | 92.7 | [87.0, 96.4] |
| S13 | 127 | 116 | 91.3 | [85.0, 95.6] |
| S14 | 165 | 163 | 98.8 | [95.7, 99.9] |
| S15 | 84 | 77 | 91.7 | [83.6, 96.6] |
| Convention year | | | | |
| Year 1 | 476 | 418 | 87.8 | [84.5, 90.6] |
| Year 2 | 554 | 487 | 87.9 | [84.9, 90.5] |
| Year 3 | 552 | 503 | 91.1 | [88.4, 93.4] |
| Year 4 | 545 | 498 | 91.4 | [88.7, 93.6] |
| Year 5 | 579 | 534 | 92.2 | [89.7, 94.3] |
| RIZIV code for complex surgery | | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,139 | 1,985 | 92.8 | [91.6, 93.9] |
| Pancreaticoduodenectomy | 1,975 | 1,829 | 92.6 | [91.4, 93.7] |
| Total Pancreatectomy | 164 | 156 | 95.1 | [90.6, 97.9] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 183 | 147 | 80.3 | [73.8, 85.8] |
| 242874-242885: Hemipancreatectomy left | 382 | 306 | 80.1 | [75.7, 84.0] |
| 242896-242900: Enucleation of a pancreatic tumour | 2 | 2 | 100.0 | [15.8, 100.0] |

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

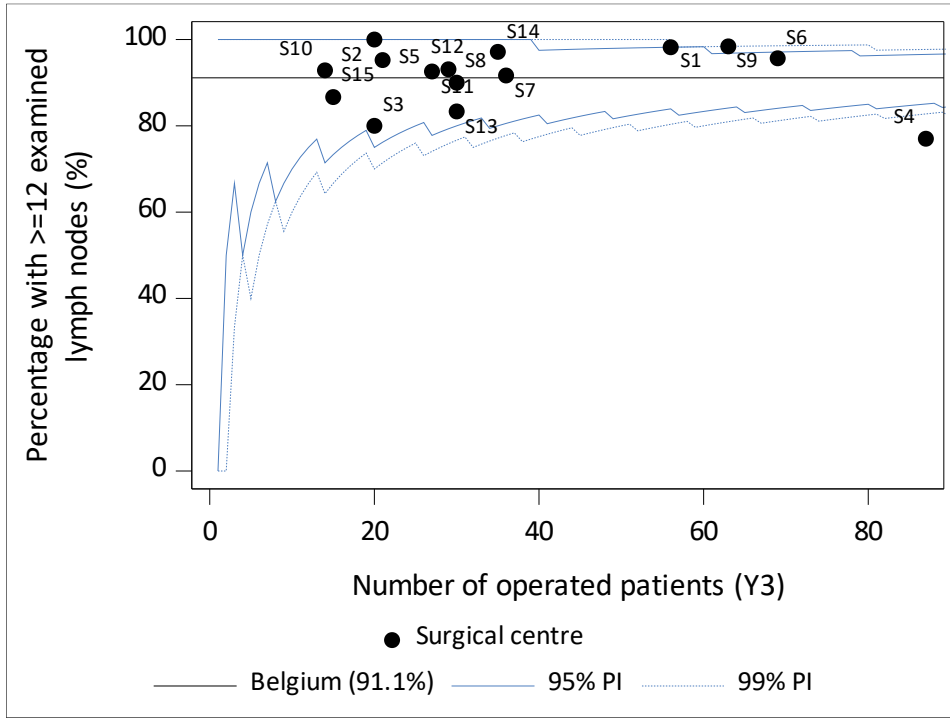
(a)



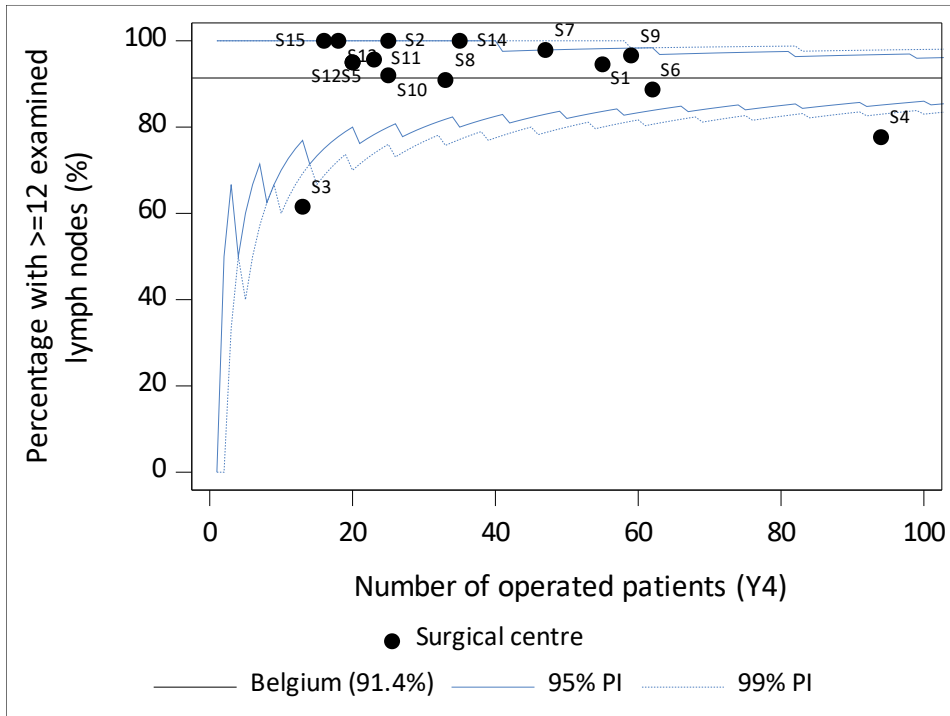
(b)



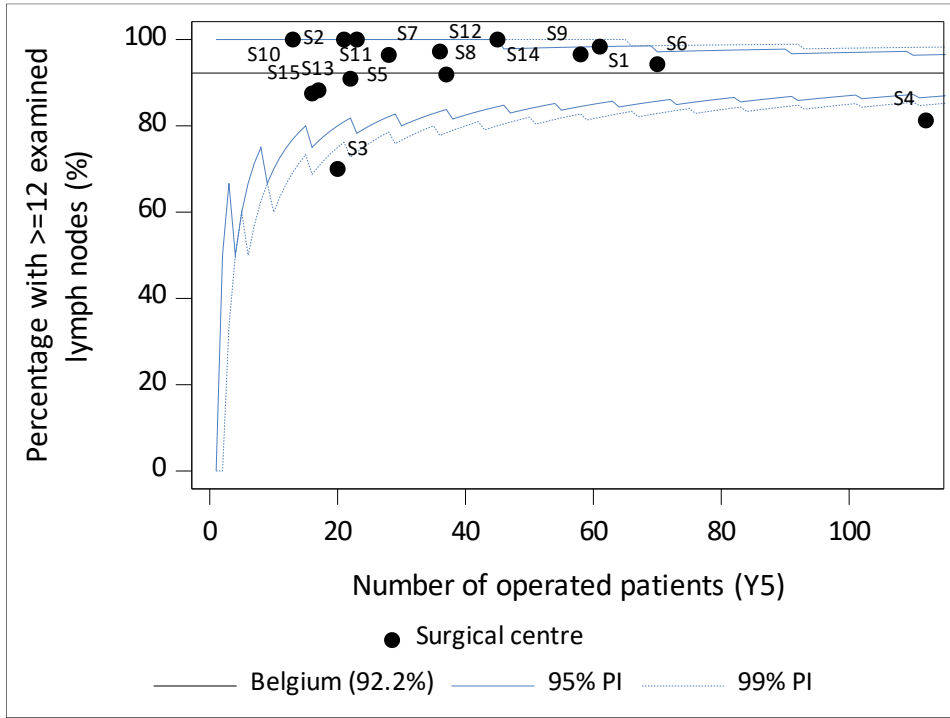
(c)



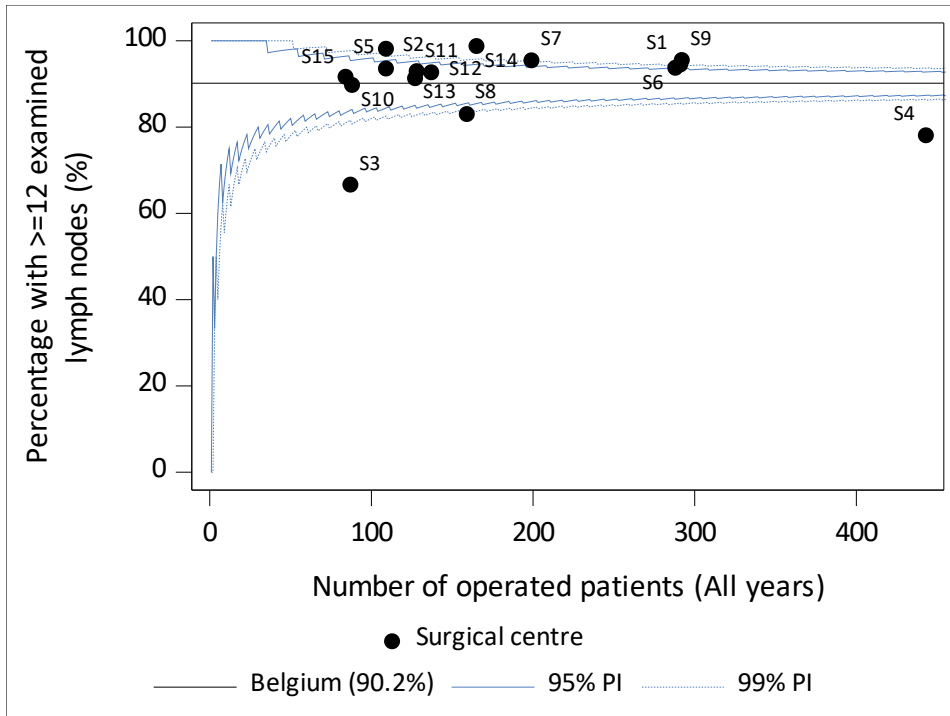
(d)



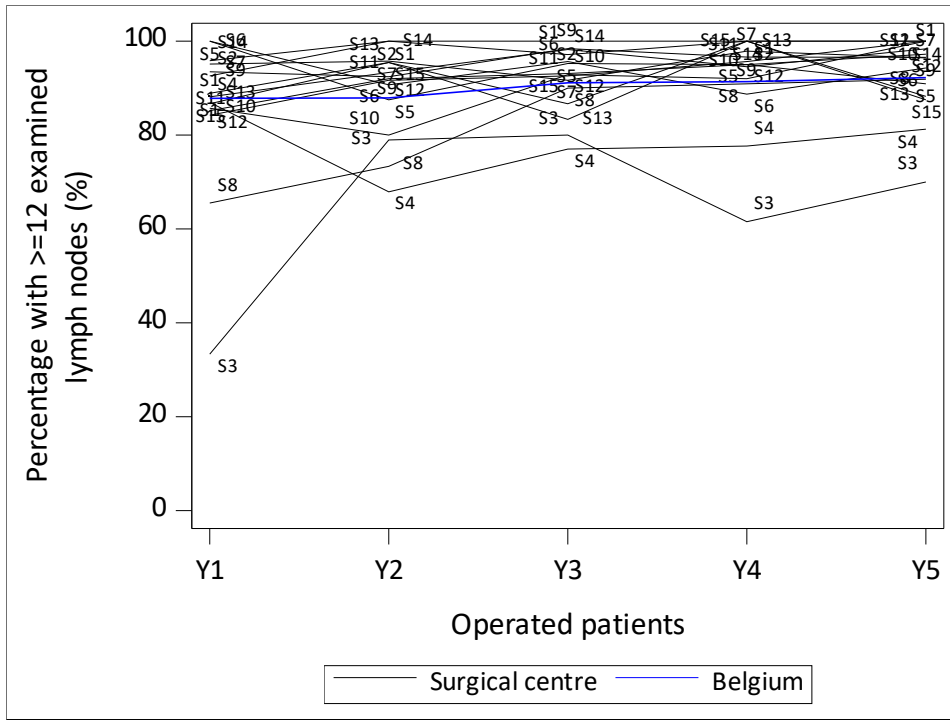
(e)



(f)



(g)



3.3. Outcome indicators

3.3.1. Postoperative mortality

3.3.1.1. Unadjusted 30-day postoperative mortality

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

| Characteristic | Unadjusted 30-day postoperative mortality | | | |
|---|---|-------------|------------|-------------------|
| | Belgium | | | |
| | N | N of deaths | % | 95% CI |
| Operated patients with a malignant/benign tumour | 4,176 | 86 | 2.1 | [1.7, 2.5] |
| Expert centres | | | | . |
| S1 | 411 | 11 | 2.7 | [1.3, 4.7] |
| S2 | 178 | 3 | 1.7 | [0.3, 4.8] |
| S3 | 118 | 5 | 4.2 | [1.4, 9.6] |
| S4 | 735 | 14 | 1.9 | [1.0, 3.2] |
| S5 | 183 | 7 | 3.8 | [1.6, 7.7] |
| S6 | 413 | 12 | 2.9 | [1.5, 5.0] |
| S7 | 320 | 1 | 0.3 | [0.0, 1.7] |
| S8 | 239 | 4 | 1.7 | [0.5, 4.2] |
| S9 | 449 | 4 | 0.9 | [0.2, 2.3] |
| S10 | 142 | 1 | 0.7 | [0.0, 3.9] |
| S11 | 176 | 8 | 4.5 | [2.0, 8.8] |
| S12 | 219 | 3 | 1.4 | [0.3, 4.0] |
| S13 | 192 | 4 | 2.1 | [0.6, 5.2] |
| S14 | 260 | 7 | 2.7 | [1.1, 5.5] |
| S15 | 141 | 2 | 1.4 | [0.2, 5.0] |
| Convention year | | | | |
| Year 1 | 724 | 18 | 2.5 | [1.5, 3.9] |
| Year 2 | 856 | 19 | 2.2 | [1.3, 3.4] |
| Year 3 | 851 | 22 | 2.6 | [1.6, 3.9] |
| Year 4 | 834 | 13 | 1.6 | [0.8, 2.7] |
| Year 5 | 911 | 14 | 1.5 | [0.8, 2.6] |
| Sex | | | | |
| Male | 2,249 | 54 | 2.4 | [1.8, 3.1] |
| Female | 1,927 | 32 | 1.7 | [1.1, 2.3] |
| Age at surgery | | | | |
| <=69 | 2,346 | 32 | 1.4 | [0.9, 1.9] |
| 70-79 | 1,448 | 38 | 2.6 | [1.9, 3.6] |

| Characteristic | Unadjusted 30-day postoperative mortality | | | |
|---|---|-------------|-----|-------------|
| | Belgium | | | |
| | N | N of deaths | % | 95% CI |
| >=80 | 382 | 16 | 4.2 | [2.4, 6.7] |
| Lesion to treat (in (peri-)pancreas) | | | | |
| Primary tumour | 4,064 | 83 | 2.0 | [1.6, 2.5] |
| Relapse of primary tumour | 54 | 2 | 3.7 | [0.5, 12.7] |
| Metastasis | 58 | 1 | 1.7 | [0.0, 9.2] |
| Morphology | | | | |
| Adenocarcinoma | 2,706 | 68 | 2.5 | [2.0, 3.2] |
| Neuroendocrine tumour | 535 | 5 | 0.9 | [0.3, 2.2] |
| Benign tumour | 603 | 6 | 1.0 | [0.4, 2.2] |
| Other or unspecified | 332 | 7 | 2.1 | [0.9, 4.3] |
| Primary tumour localisation | | | | |
| C17.0 Duodenum | 180 | 8 | 4.4 | [1.9, 8.6] |
| C24.0 Extrahepatic bile duct | 214 | 8 | 3.7 | [1.6, 7.2] |
| C24.1 (Peri-) ampullary region | 345 | 11 | 3.2 | [1.6, 5.6] |
| C25.0 Head of pancreas | 1,573 | 39 | 2.5 | [1.8, 3.4] |
| C25.1 Body of pancreas | 373 | 5 | 1.3 | [0.4, 3.1] |
| C25.2 Tail of pancreas | 542 | 1 | 0.2 | [0.0, 1.0] |
| C25.3 Pancreatic duct | 18 | 0 | 0.0 | [0.0, 18.5] |
| C25.4 Islands of Langerhans | 34 | 0 | 0.0 | [0.0, 10.3] |
| C25.7-9 Other specified parts of pancreas | 182 | 6 | 3.3 | [1.2, 7.0] |
| Other | 112 | 2 | 1.8 | [0.2, 6.3] |
| Missing or benign | 603 | 6 | 1.0 | [0.4, 2.2] |
| Clinical stage | | | | |
| 0 | 84 | 0 | 0.0 | [0.0, 4.3] |
| I | 1,717 | 42 | 2.4 | [1.8, 3.3] |
| II | 985 | 20 | 2.0 | [1.2, 3.1] |
| III | 380 | 7 | 1.8 | [0.7, 3.8] |
| IV | 96 | 0 | 0.0 | [0.0, 3.8] |
| X | 204 | 9 | 4.4 | [2.0, 8.2] |
| TNM not applicable or relapse* | 710 | 8 | 1.1 | [0.5, 2.2] |
| Prior surgery or other treatment ** | | | | |
| Prior abdominal surgery | 605 | 16 | 2.6 | [1.5, 4.3] |
| Other treatment modality (that could affect the pancreas) | 558 | 16 | 2.9 | [1.6, 4.6] |
| Neoadjuvant treatment | | | | |
| Chemoradiotherapy | 88 | 2 | 2.3 | [0.3, 8.0] |
| Chemotherapy | 586 | 5 | 0.9 | [0.3, 2.0] |
| Radiotherapy | 4 | 0 | 0.0 | [0.0, 60.2] |
| No chemo or radiation treatment | 3,498 | 79 | 2.3 | [1.8, 2.8] |
| Charlson Comorbidity Index | | | | |
| 0 | 1,729 | 13 | 0.8 | [0.4, 1.3] |

| Unadjusted 30-day postoperative mortality | | | | |
|---|-------|-------------|------|-------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| 1 | 1,005 | 31 | 3.1 | [2.1, 4.3] |
| 2 | 669 | 21 | 3.1 | [2.0, 4.8] |
| 3 | 343 | 10 | 2.9 | [1.4, 5.3] |
| 4 | 205 | 3 | 1.5 | [0.3, 4.2] |
| 5 | 86 | 3 | 3.5 | [0.7, 9.9] |
| 6 | 61 | 3 | 4.9 | [1.0, 13.7] |
| 7 | 37 | 1 | 2.7 | [0.1, 14.2] |
| 8 | 23 | 0 | 0.0 | [0.0, 14.8] |
| 9 | 10 | 1 | 10.0 | [0.3, 44.5] |
| 10 | 5 | 0 | 0.0 | [0.0, 52.2] |
| 11 | 1 | 0 | 0.0 | [0.0, 97.5] |
| 12 | 2 | 0 | 0.0 | [0.0, 84.2] |
| WHO score at surgery | | | | |
| 0 - Asymptomatic, normal activity | 1,245 | 16 | 1.3 | [0.7, 2.1] |
| 1 - Symptomatic, but ambulant | 2,488 | 54 | 2.2 | [1.6, 2.8] |
| 2 - Symptomatic, bedbound < 50% day | 380 | 13 | 3.4 | [1.8, 5.8] |
| 3 - Symptomatic, bedbound > 50% day | 61 | 3 | 4.9 | [1.0, 13.7] |
| 4 - Completely dependent, 100% bedbound | 2 | 0 | 0.0 | [0.0, 84.2] |
| ASA score | | | | |
| 1 - Healthy person | 269 | 3 | 1.1 | [0.2, 3.2] |
| 2 - Mild systemic disease, normal activity | 2,189 | 36 | 1.6 | [1.2, 2.3] |
| 3 - Serious systemic disease, limited activity | 1,670 | 45 | 2.7 | [2.0, 3.6] |
| 4 - Life-threatening illness, handicapped | 48 | 2 | 4.2 | [0.5, 14.3] |
| Resectability status ** | | | | |
| Before neoadjuvant treatment | | | | |
| Upfront resectable | 135 | 0 | 0.0 | [0.0, 2.7] |
| Borderline resectable | 326 | 6 | 1.8 | [0.7, 4.0] |
| Unresectable | 82 | 1 | 1.2 | [0.0, 6.6] |
| No neoadjuvant treatment | 2,118 | 49 | 2.3 | [1.7, 3.0] |
| Before surgery | | | | |
| Upfront resectable | 2,280 | 49 | 2.1 | [1.6, 2.8] |
| Borderline resectable | 352 | 7 | 2.0 | [0.8, 4.1] |
| Unresectable | 22 | 0 | 0.0 | [0.0, 15.4] |
| Missing | 7 | 0 | 0.0 | [0.0, 41.0] |
| Type of surgery | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 1,161 | 13 | 1.1 | [0.6, 1.9] |
| Minimally invasive surgery (MIS) - Hybrid | 5 | 0 | 0.0 | [0.0, 52.2] |
| Minimally invasive surgery (MIS) - Robotic | 488 | 8 | 1.6 | [0.7, 3.2] |
| Open | 2,331 | 54 | 2.3 | [1.7, 3.0] |
| Conversion from MIS to open surgery | 191 | 11 | 5.8 | [2.9, 10.1] |

| Characteristic | Unadjusted 30-day postoperative mortality | | | |
|---|---|-------------|------|-------------|
| | Belgium | | | |
| | N | N of deaths | % | 95% CI |
| <i>Simultaneous venous resection</i> | | | | |
| No | 3,660 | 70 | 1.9 | [1.5, 2.4] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 516 | 16 | 3.1 | [1.8, 5.0] |
| - With primary wedge-reconstruction | 165 | 4 | 2.4 | [0.7, 6.1] |
| - With primary end-to-end reconstruction | 215 | 7 | 3.3 | [1.3, 6.6] |
| - With vascular autograft interposition | 12 | 0 | 0.0 | [0.0, 26.5] |
| - With vascular allograft interposition | 61 | 2 | 3.3 | [0.4, 11.3] |
| - With synthetic/prosthetic interposition | 10 | 2 | 20.0 | [2.5, 55.6] |
| - With peritoneal patch wedge-reconstruction | 43 | 0 | 0.0 | [0.0, 8.2] |
| - Without reconstruction | 10 | 1 | 10.0 | [0.3, 44.5] |
| <i>Simultaneous arterial resection **</i> | | | | |
| No | 4,106 | 85 | 2.1 | [1.7, 2.6] |
| Hepatic artery resection | 28 | 0 | 0.0 | [0.0, 12.3] |
| - With primary end-to-end reconstruction | 17 | 0 | 0.0 | [0.0, 19.5] |
| - With vascular allograft interposition | 1 | 0 | 0.0 | [0.0, 97.5] |
| - Without reconstruction | 10 | 0 | 0.0 | [0.0, 30.8] |
| Coeliac trunk resection | 32 | 1 | 3.1 | [0.1, 16.2] |
| - With primary end-to-end reconstruction | 2 | 0 | 0.0 | [0.0, 84.2] |
| - Without reconstruction | 30 | 1 | 3.3 | [0.1, 17.2] |
| Superior mesenteric artery (SMA) resection | 9 | 0 | 0.0 | [0.0, 33.6] |
| - With primary wedge-reconstruction | 1 | 0 | 0.0 | [0.0, 97.5] |
| - With primary end-to-end reconstruction | 3 | 0 | 0.0 | [0.0, 70.8] |
| - With vascular autograft interposition | 2 | 0 | 0.0 | [0.0, 84.2] |
| - Without reconstruction | 3 | 0 | 0.0 | [0.0, 70.8] |
| <i>Simultaneous other organ resection **</i> | | | | |
| No | 2,541 | 59 | 2.3 | [1.8, 3.0] |
| Colon | 107 | 5 | 4.7 | [1.5, 10.6] |
| Stomach | 596 | 17 | 2.9 | [1.7, 4.5] |
| Adrenal gland | 88 | 0 | 0.0 | [0.0, 4.1] |
| Spleen | 932 | 9 | 1.0 | [0.4, 1.8] |
| Other | 262 | 3 | 1.1 | [0.2, 3.3] |
| <i>RIZIV code for complex surgery</i> | | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,762 | 74 | 2.7 | [2.1, 3.4] |
| Pancreaticoduodenectomy | 2,499 | 68 | 2.7 | [2.1, 3.4] |
| Total Pancreatectomy | 263 | 6 | 2.3 | [0.8, 4.9] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 400 | 5 | 1.3 | [0.4, 2.9] |
| 242874-242885: Hemipancreatectomy left | 950 | 6 | 0.6 | [0.2, 1.4] |
| 242896-242900: Enucleation of a pancreatic tumour | 64 | 1 | 1.6 | [0.0, 8.4] |
| <i>Antithrombotic medication</i> | | | | |

| Unadjusted 30-day postoperative mortality | | | | |
|---|-------|-------------|-----|------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | | 95% CI |
| | | | % | |
| No | 2,945 | 46 | 1.6 | [1.1, 2.1] |
| Yes | 1,231 | 40 | 3.2 | [2.3, 4.4] |
| <i>Was the patient referred?</i> | | | | |
| No | 1,886 | 36 | 1.9 | [1.3, 2.6] |
| Yes | 2,290 | 50 | 2.2 | [1.6, 2.9] |

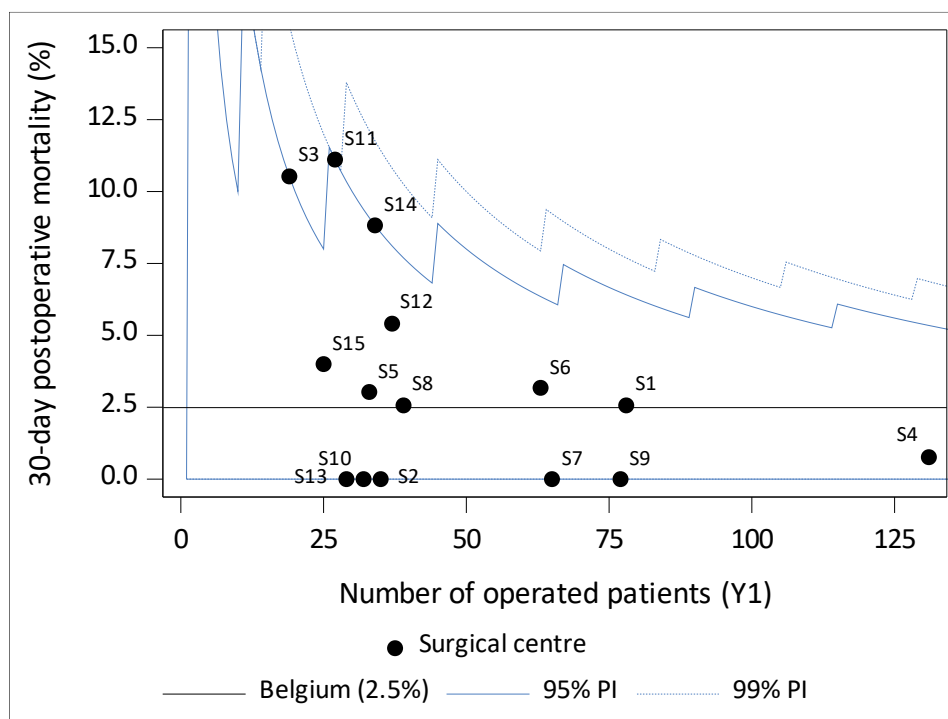
* Tumour staging not possible.

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

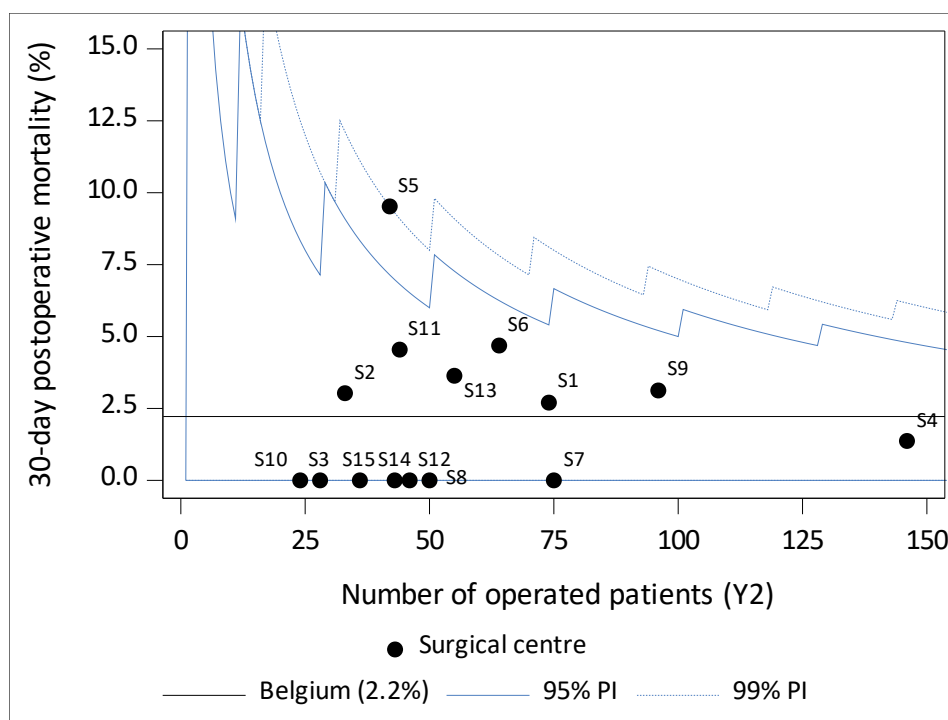
** Results for this variable are only for malignant tumours and only available from the second half of Y2 onwards.

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

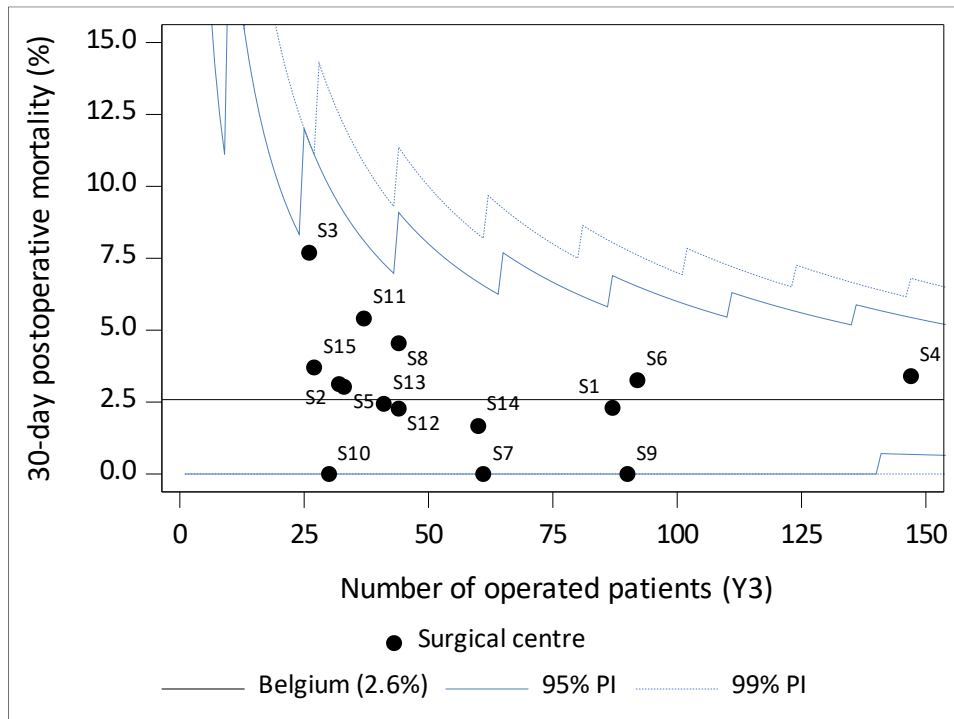
(a)



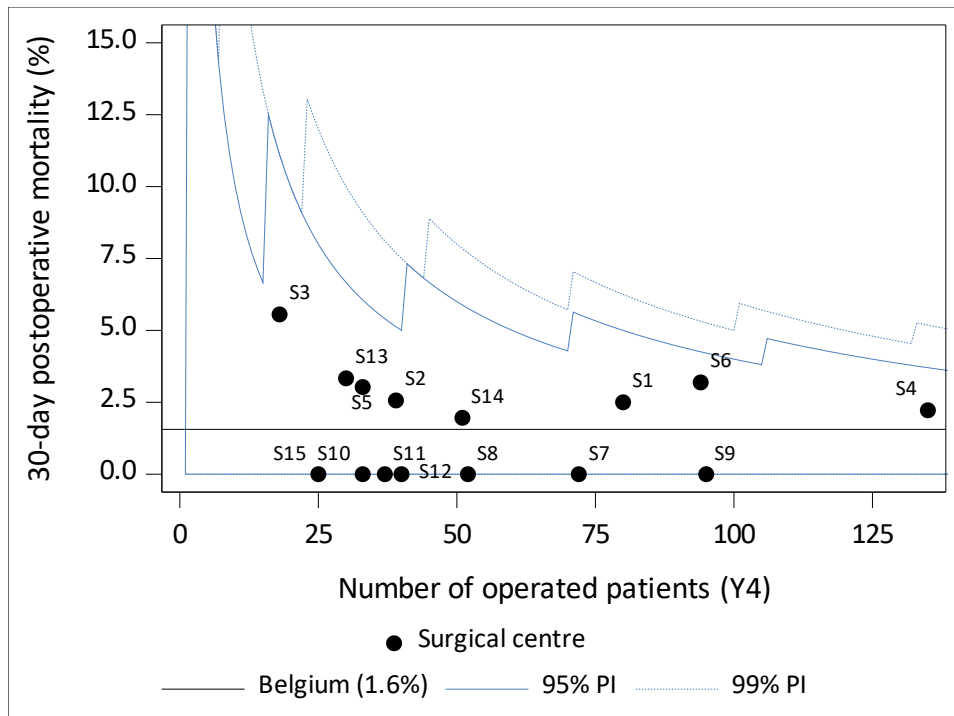
(b)



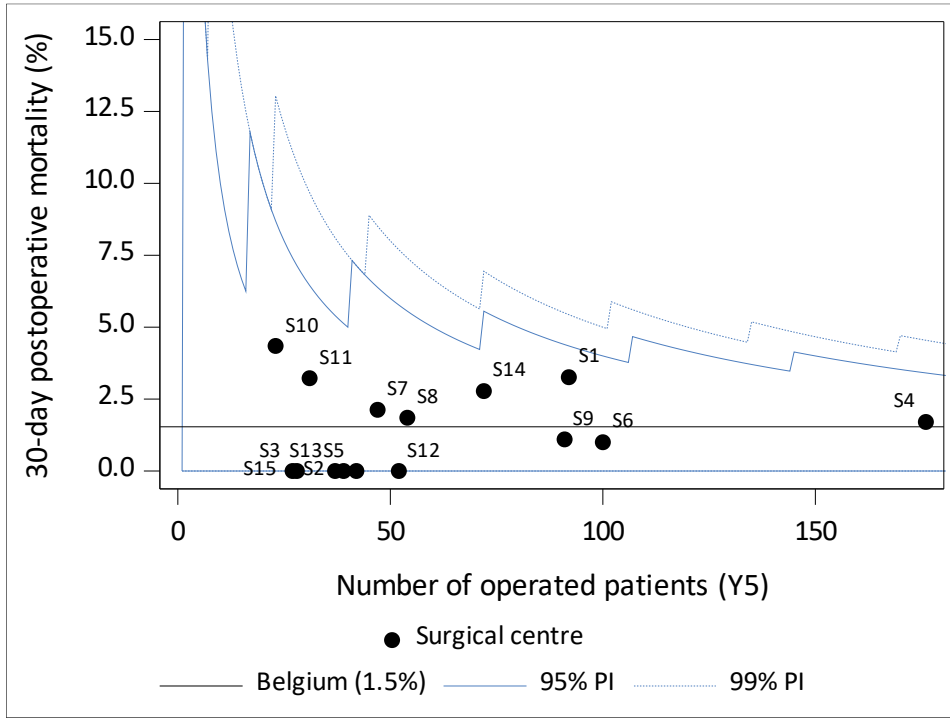
(c)



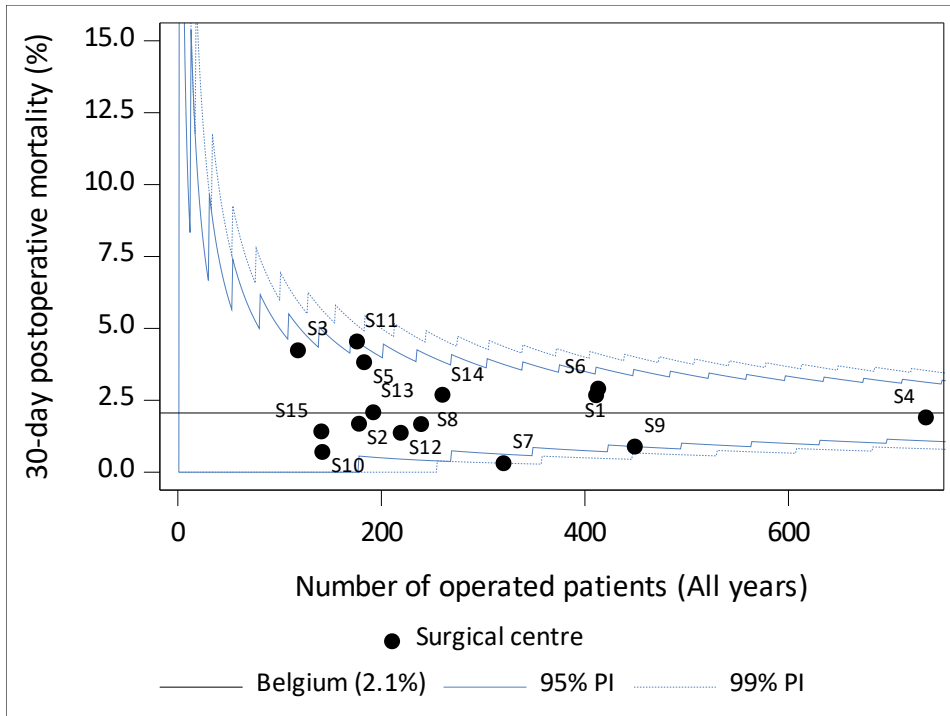
(d)



(e)



(f)



3.3.1.2 Adjusted 30-day postoperative mortality

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

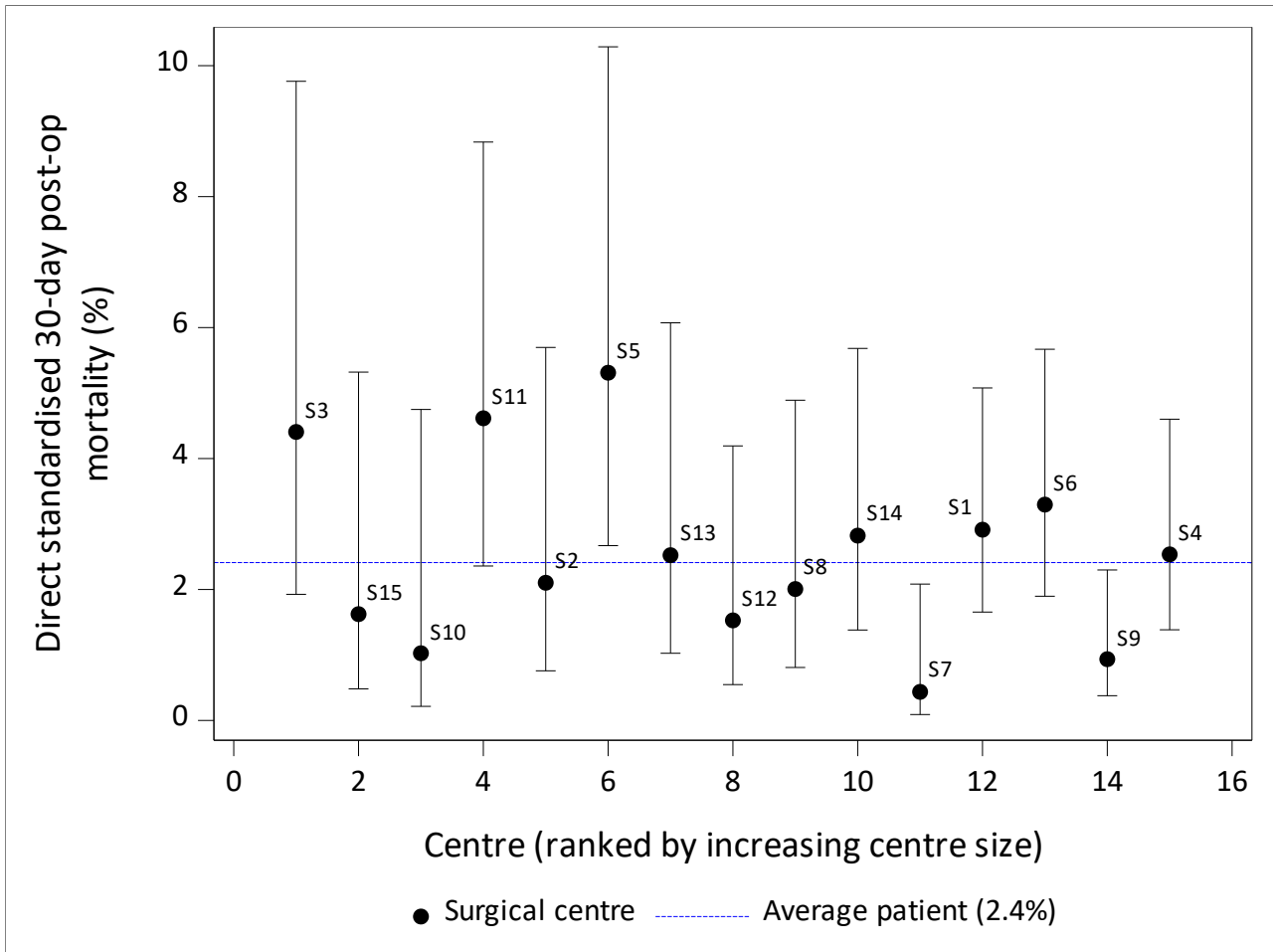
| Expert centres | Adjusted Odds Ratio | | | Standardised probability (%) | | |
|----------------|---------------------|--------------|-----------------|------------------------------|-------------|-----------------|
| | Estimate | 95% CI | Average patient | Estimate | 95% CI | Average patient |
| S1 | 1.38 | [0.75, 2.53] | 0.96 | 2.9 | [1.7, 5.1] | 2.4 |
| S2 | 0.98 | [0.36, 2.69] | 0.96 | 2.1 | [0.8, 5.7] | 2.4 |
| S3 | 2.14 | [0.92, 4.99] | 0.96 | 4.4 | [1.9, 9.8] | 2.4 |
| S4 | 1.19 | [0.61, 2.34] | 0.96 | 2.5 | [1.4, 4.6] | 2.4 |
| S5 | 2.62 | [1.26, 5.45] | 0.96 | 5.3 | [2.7, 10.3] | 2.4 |
| S6 | 1.57 | [0.87, 2.85] | 0.96 | 3.3 | [1.9, 5.7] | 2.4 |
| S7 | 0.20 | [0.04, 0.88] | 0.96 | 0.4 | [0.1, 2.1] | 2.4 |
| S8 | 0.94 | [0.38, 2.32] | 0.96 | 2.0 | [0.8, 4.9] | 2.4 |
| S9 | 0.43 | [0.18, 1.04] | 0.96 | 0.9 | [0.4, 2.3] | 2.4 |
| S10 | 0.47 | [0.11, 2.09] | 0.96 | 1.0 | [0.2, 4.7] | 2.4 |
| S11 | 2.25 | [1.11, 4.55] | 0.96 | 4.6 | [2.4, 8.8] | 2.4 |
| S12 | 0.71 | [0.26, 1.94] | 0.96 | 1.5 | [0.5, 4.2] | 2.4 |
| S13 | 1.19 | [0.48, 2.92] | 0.96 | 2.5 | [1.0, 6.1] | 2.4 |
| S14 | 1.33 | [0.63, 2.82] | 0.96 | 2.8 | [1.4, 5.7] | 2.4 |
| S15 | 0.75 | [0.23, 2.45] | 0.96 | 1.6 | [0.5, 5.3] | 2.4 |

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

This table shows the case-mix adjusted odds ratio for postoperative mortality within 30 days and the center specific direct 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 15: Direct standardised 30-day postoperative mortality in the five convention years, by surgical centre.



3.3.1.3. Unadjusted 90-day postoperative mortality

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

| Unadjusted 90-day postoperative mortality | | | | |
|---|--------------|-------------|------------|-------------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| Operated patients with a malignant/benign tumour | 4,176 | 184 | 4.4 | [3.8, 5.1] |
| Expert centres | | | | . |
| S1 | 411 | 19 | 4.6 | [2.8, 7.1] |
| S2 | 178 | 13 | 7.3 | [3.9, 12.2] |
| S3 | 118 | 8 | 6.8 | [3.0, 12.9] |
| S4 | 735 | 29 | 3.9 | [2.7, 5.6] |
| S5 | 183 | 9 | 4.9 | [2.3, 9.1] |
| S6 | 413 | 23 | 5.6 | [3.6, 8.2] |
| S7 | 320 | 6 | 1.9 | [0.7, 4.0] |
| S8 | 239 | 11 | 4.6 | [2.3, 8.1] |
| S9 | 449 | 11 | 2.4 | [1.2, 4.3] |
| S10 | 142 | 7 | 4.9 | [2.0, 9.9] |
| S11 | 176 | 14 | 8.0 | [4.4, 13.0] |
| S12 | 219 | 7 | 3.2 | [1.3, 6.5] |
| S13 | 192 | 5 | 2.6 | [0.9, 6.0] |
| S14 | 260 | 11 | 4.2 | [2.1, 7.4] |
| S15 | 141 | 11 | 7.8 | [4.0, 13.5] |
| Convention year | | | | |
| Year 1 | 724 | 33 | 4.6 | [3.2, 6.3] |
| Year 2 | 856 | 47 | 5.5 | [4.1, 7.2] |
| Year 3 | 851 | 45 | 5.3 | [3.9, 7.0] |
| Year 4 | 834 | 28 | 3.4 | [2.2, 4.8] |
| Year 5 | 911 | 31 | 3.4 | [2.3, 4.8] |
| Sex | | | | |
| Male | 2,249 | 103 | 4.6 | [3.8, 5.5] |
| Female | 1,927 | 81 | 4.2 | [3.4, 5.2] |
| Age at surgery | | | | |
| <=69 | 2,346 | 63 | 2.7 | [2.1, 3.4] |
| 70-79 | 1,448 | 90 | 6.2 | [5.0, 7.6] |
| >=80 | 382 | 31 | 8.1 | [5.6, 11.3] |
| Lesion to treat (in (peri-)pancreas) | | | | |
| Primary tumour | 4,064 | 177 | 4.4 | [3.7, 5.0] |
| Relapse of primary tumour | 54 | 4 | 7.4 | [2.1, 17.9] |
| Metastasis | 58 | 3 | 5.2 | [1.1, 14.4] |
| Morphology | | | | |

| Unadjusted 90-day postoperative mortality | | | | | |
|---|-------|-------------|------|-------------|--|
| Belgium | | | | | |
| Characteristic | N | N of deaths | % | 95% CI | |
| Adenocarcinoma | 2,706 | 149 | 5.5 | [4.7, 6.4] | |
| Neuroendocrine tumour | 535 | 14 | 2.6 | [1.4, 4.4] | |
| Benign tumour | 603 | 10 | 1.7 | [0.8, 3.0] | |
| Other or unspecified | 332 | 11 | 3.3 | [1.7, 5.9] | |
| Primary tumour localisation | | | | | |
| C17.0 Duodenum | 180 | 13 | 7.2 | [3.9, 12.0] | |
| C24.0 Extrahepatic bile duct | 214 | 16 | 7.5 | [4.3, 11.9] | |
| C24.1 (Peri-) ampullary region | 345 | 17 | 4.9 | [2.9, 7.8] | |
| C25.0 Head of pancreas | 1,573 | 92 | 5.8 | [4.7, 7.1] | |
| C25.1 Body of pancreas | 373 | 13 | 3.5 | [1.9, 5.9] | |
| C25.2 Tail of pancreas | 542 | 9 | 1.7 | [0.8, 3.1] | |
| C25.3 Pancreatic duct | 18 | 0 | 0.0 | [0.0, 18.5] | |
| C25.4 Islands of Langerhans | 34 | 0 | 0.0 | [0.0, 10.3] | |
| C25.7-9 Other specified parts of pancreas | 182 | 10 | 5.5 | [2.7, 9.9] | |
| Other | 112 | 4 | 3.6 | [1.0, 8.9] | |
| Missing or benign | 603 | 10 | 1.7 | [0.8, 3.0] | |
| Clinical stage | | | | | |
| 0 | 84 | 1 | 1.2 | [0.0, 6.5] | |
| I | 1,717 | 81 | 4.7 | [3.8, 5.8] | |
| II | 985 | 52 | 5.3 | [4.0, 6.9] | |
| III | 380 | 19 | 5.0 | [3.0, 7.7] | |
| IV | 96 | 4 | 4.2 | [1.1, 10.3] | |
| X | 204 | 12 | 5.9 | [3.1, 10.0] | |
| TNM not applicable or relapse* | 710 | 15 | 2.1 | [1.2, 3.5] | |
| Prior surgery or other treatment ** | | | | | |
| Prior abdominal surgery | 605 | 29 | 4.8 | [3.2, 6.8] | |
| Other treatment modality (that could affect the pancreas) | 558 | 34 | 6.1 | [4.3, 8.4] | |
| Neoadjuvant treatment | | | | | |
| Chemoradiotherapy | 88 | 6 | 6.8 | [2.5, 14.3] | |
| Chemotherapy | 586 | 13 | 2.2 | [1.2, 3.8] | |
| Radiotherapy | 4 | 0 | 0.0 | [0.0, 60.2] | |
| No chemo or radiation treatment | 3,498 | 165 | 4.7 | [4.0, 5.5] | |
| Charlson Comorbidity Index | | | | | |
| 0 | 1,729 | 45 | 2.6 | [1.9, 3.5] | |
| 1 | 1,005 | 52 | 5.2 | [3.9, 6.7] | |
| 2 | 669 | 35 | 5.2 | [3.7, 7.2] | |
| 3 | 343 | 17 | 5.0 | [2.9, 7.8] | |
| 4 | 205 | 12 | 5.9 | [3.1, 10.0] | |
| 5 | 86 | 10 | 11.6 | [5.7, 20.3] | |
| 6 | 61 | 6 | 9.8 | [3.7, 20.2] | |
| 7 | 37 | 3 | 8.1 | [1.7, 21.9] | |

| Unadjusted 90-day postoperative mortality | | | | | |
|--|-------|-------------|------|-------------|--|
| Belgium | | | | | |
| Characteristic | N | N of deaths | % | 95% CI | |
| 8 | 23 | 1 | 4.3 | [0.1, 21.9] | |
| 9 | 10 | 1 | 10.0 | [0.3, 44.5] | |
| 10 | 5 | 2 | 40.0 | [5.3, 85.3] | |
| 11 | 1 | 0 | 0.0 | [0.0, 97.5] | |
| 12 | 2 | 0 | 0.0 | [0.0, 84.2] | |
| WHO score at surgery | | | | | |
| 0 - Asymptomatic, normal activity | 1,245 | 31 | 2.5 | [1.7, 3.5] | |
| 1 - Symptomatic, but ambulant | 2,488 | 107 | 4.3 | [3.5, 5.2] | |
| 2 - Symptomatic, bedbound < 50% day | 380 | 36 | 9.5 | [6.7, 12.9] | |
| 3 - Symptomatic, bedbound > 50% day | 61 | 9 | 14.8 | [7.0, 26.2] | |
| 4 - Completely dependent, 100% bedbound | 2 | 1 | 50.0 | [1.3, 98.7] | |
| ASA score | | | | | |
| 1 - Healthy person | 269 | 6 | 2.2 | [0.8, 4.8] | |
| 2 - Mild systemic disease, normal activity | 2,189 | 80 | 3.7 | [2.9, 4.5] | |
| 3 - Serious systemic disease, limited activity | 1,670 | 94 | 5.6 | [4.6, 6.8] | |
| 4 - Life-threatening illness, handicapped | 48 | 4 | 8.3 | [2.3, 20.0] | |
| Resectability status ^{**} | | | | | |
| Before neoadjuvant treatment | | | | | |
| Upfront resectable | 135 | 2 | 1.5 | [0.2, 5.2] | |
| Borderline resectable | 326 | 13 | 4.0 | [2.1, 6.7] | |
| Unresectable | 82 | 3 | 3.7 | [0.8, 10.3] | |
| No neoadjuvant treatment | 2,118 | 106 | 5.0 | [4.1, 6.0] | |
| Before surgery | | | | | |
| Upfront resectable | 2,280 | 106 | 4.6 | [3.8, 5.6] | |
| Borderline resectable | 352 | 17 | 4.8 | [2.8, 7.6] | |
| Unresectable | 22 | 0 | 0.0 | [0.0, 15.4] | |
| Missing | 7 | 1 | 14.3 | [0.4, 57.9] | |
| Type of surgery | | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 1,161 | 27 | 2.3 | [1.5, 3.4] | |
| Minimally invasive surgery (MIS) - Hybrid | 5 | 1 | 20.0 | [0.5, 71.6] | |
| Minimally invasive surgery (MIS) - Robotic | 488 | 15 | 3.1 | [1.7, 5.0] | |
| Open | 2,331 | 124 | 5.3 | [4.4, 6.3] | |
| Conversion from MIS to open surgery | 191 | 17 | 8.9 | [5.3, 13.9] | |
| Simultaneous venous resection | | | | | |
| No | 3,660 | 149 | 4.1 | [3.5, 4.8] | |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 516 | 35 | 6.8 | [4.8, 9.3] | |
| - With primary wedge-reconstruction | 165 | 10 | 6.1 | [2.9, 10.9] | |
| - With primary end-to-end reconstruction | 215 | 16 | 7.4 | [4.3, 11.8] | |
| - With vascular autograft interposition | 12 | 0 | 0.0 | [0.0, 26.5] | |
| - With vascular allograft interposition | 61 | 4 | 6.6 | [1.8, 15.9] | |
| - With synthetic/prosthetic interposition | 10 | 2 | 20.0 | [2.5, 55.6] | |

| Unadjusted 90-day postoperative mortality | | | | |
|---|-------|-------------|-------|--------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| - With peritoneal patch wedge-reconstruction | 43 | 2 | 4.7 | [0.6, 15.8] |
| - Without reconstruction | 10 | 1 | 10.0 | [0.3, 44.5] |
| <i>Simultaneous arterial resection **</i> | | | | |
| No | 4,106 | 181 | 4.4 | [3.8, 5.1] |
| Hepatic artery resection | 28 | 0 | 0.0 | [0.0, 12.3] |
| - With primary end-to-end reconstruction | 17 | 0 | 0.0 | [0.0, 19.5] |
| - With vascular allograft interposition | 1 | 0 | 0.0 | [0.0, 97.5] |
| - Without reconstruction | 10 | 0 | 0.0 | [0.0, 30.8] |
| Coeliac trunk resection | 32 | 2 | 6.3 | [0.8, 20.8] |
| - With primary end-to-end reconstruction | 2 | 0 | 0.0 | [0.0, 84.2] |
| - Without reconstruction | 30 | 2 | 6.7 | [0.8, 22.1] |
| Superior mesenteric artery (SMA) resection | 9 | 1 | 11.1 | [0.3, 48.2] |
| - With primary wedge-reconstruction | 1 | 1 | 100.0 | [2.5, 100.0] |
| - With primary end-to-end reconstruction | 3 | 0 | 0.0 | [0.0, 70.8] |
| - With vascular autograft interposition | 2 | 0 | 0.0 | [0.0, 84.2] |
| - Without reconstruction | 3 | 0 | 0.0 | [0.0, 70.8] |
| <i>Simultaneous other organ resection **</i> | | | | |
| No | 2,541 | 124 | 4.9 | [4.1, 5.8] |
| Colon | 107 | 6 | 5.6 | [2.1, 11.8] |
| Stomach | 596 | 33 | 5.5 | [3.8, 7.7] |
| Adrenal gland | 88 | 1 | 1.1 | [0.0, 6.2] |
| Spleen | 932 | 25 | 2.7 | [1.7, 3.9] |
| Other | 262 | 7 | 2.7 | [1.1, 5.4] |
| <i>RIZIV code for complex surgery</i> | | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,762 | 153 | 5.5 | [4.7, 6.5] |
| Pancreaticoduodenectomy | 2,499 | 136 | 5.4 | [4.6, 6.4] |
| Total Pancreatectomy | 263 | 17 | 6.5 | [3.8, 10.1] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 400 | 9 | 2.3 | [1.0, 4.2] |
| 242874-242885: Hemipancreatectomy left | 950 | 21 | 2.2 | [1.4, 3.4] |
| 242896-242900: Enucleation of a pancreatic tumour | 64 | 1 | 1.6 | [0.0, 8.4] |
| <i>Antithrombotic medication</i> | | | | |
| No | 2,945 | 115 | 3.9 | [3.2, 4.7] |
| Yes | 1,231 | 69 | 5.6 | [4.4, 7.0] |
| <i>Was the patient referred?</i> | | | | |
| No | 1,886 | 75 | 4.0 | [3.1, 5.0] |
| Yes | 2,290 | 109 | 4.8 | [3.9, 5.7] |

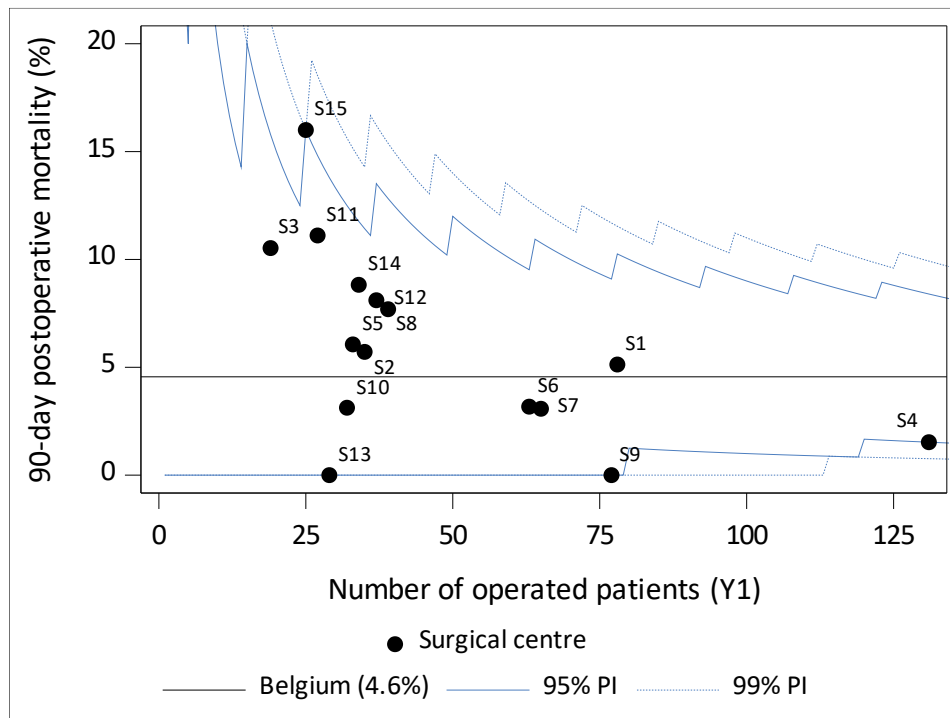
* Tumour staging not possible.

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

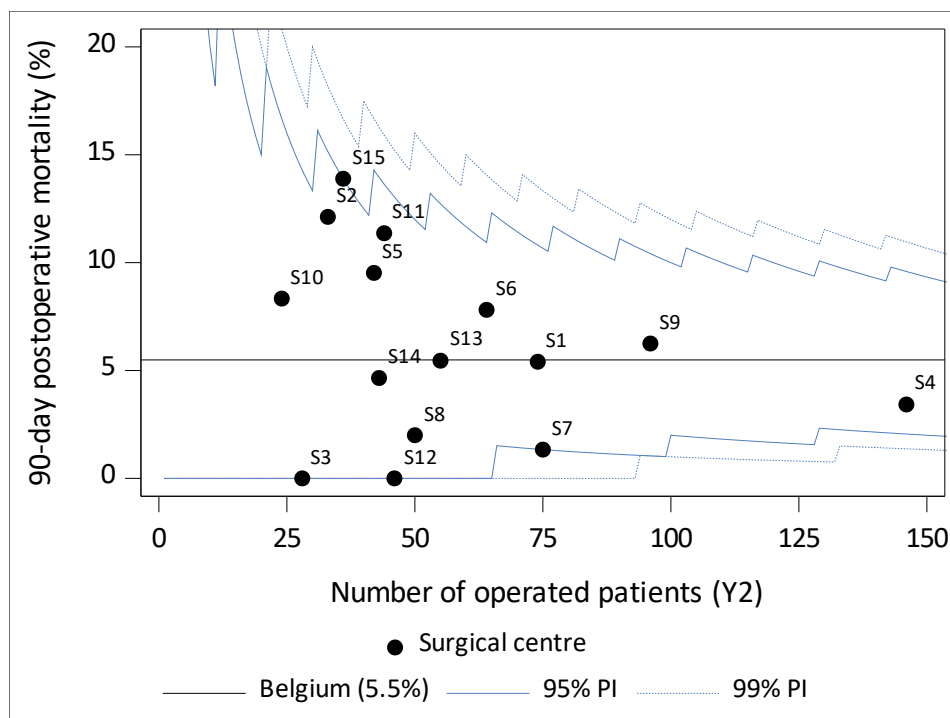
‡‡ Results for this variable are only for malignant tumours and are only available from the second half of Y2 onwards.

Figure 16: Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality for **malignant and benign tumoural** pathology, 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.

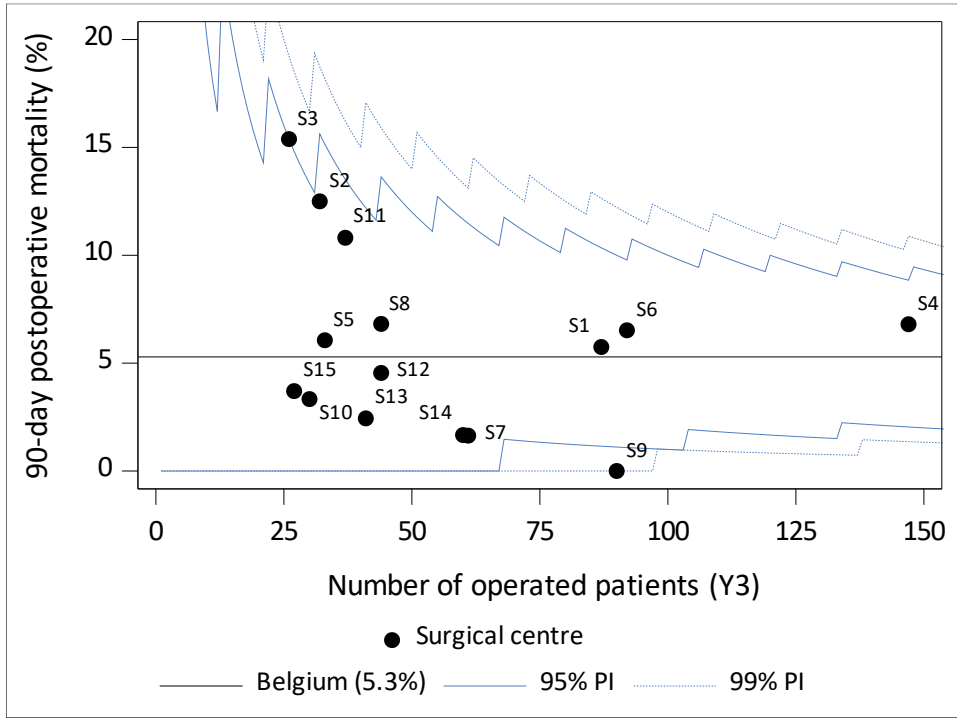
(a)



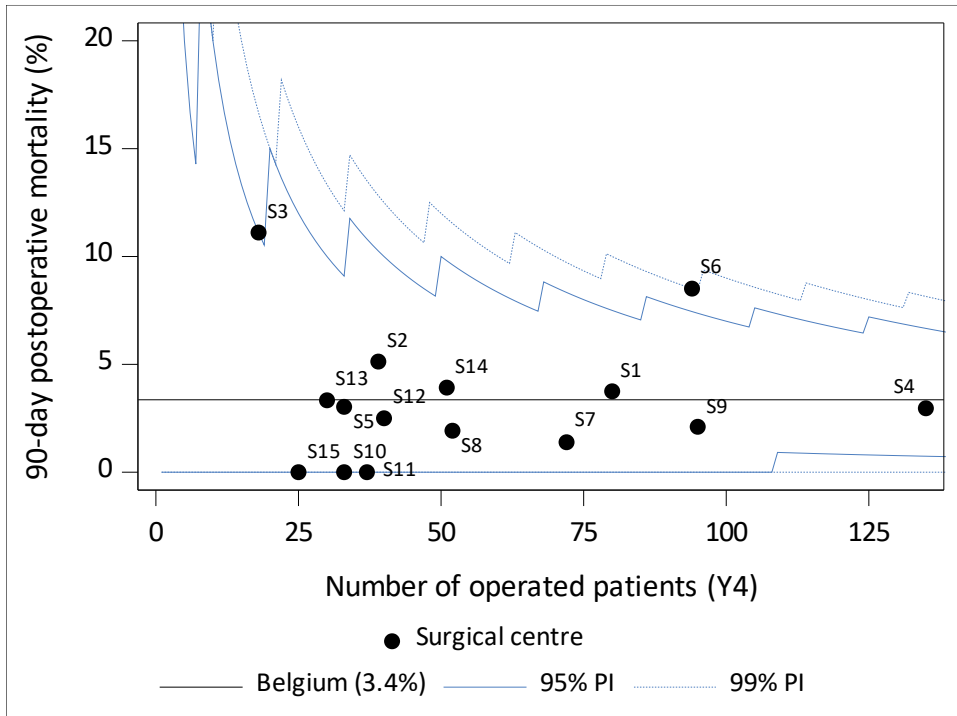
(b)



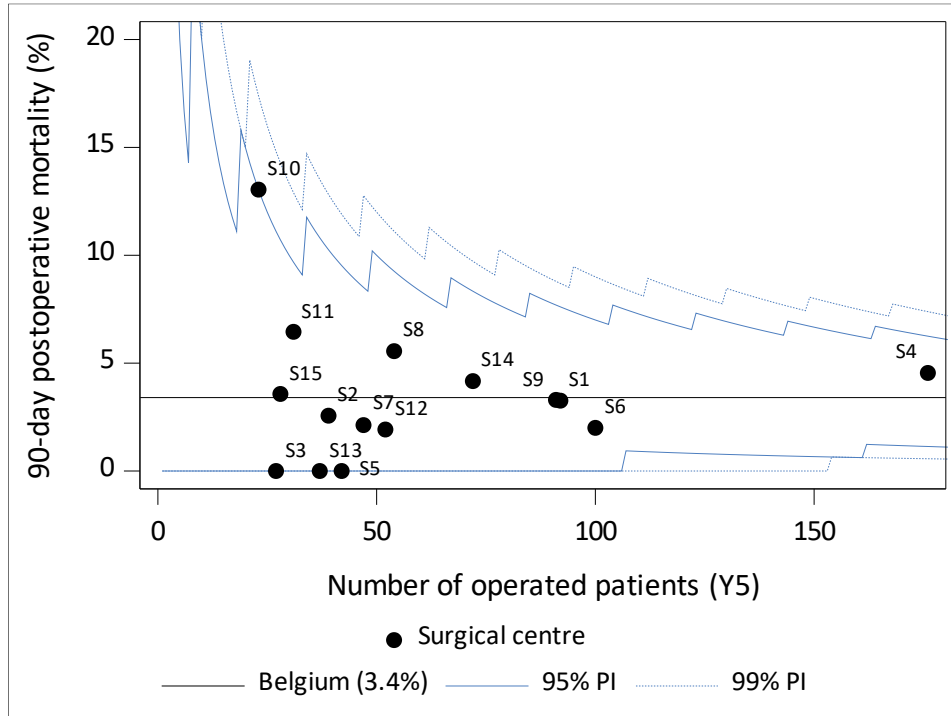
(c)



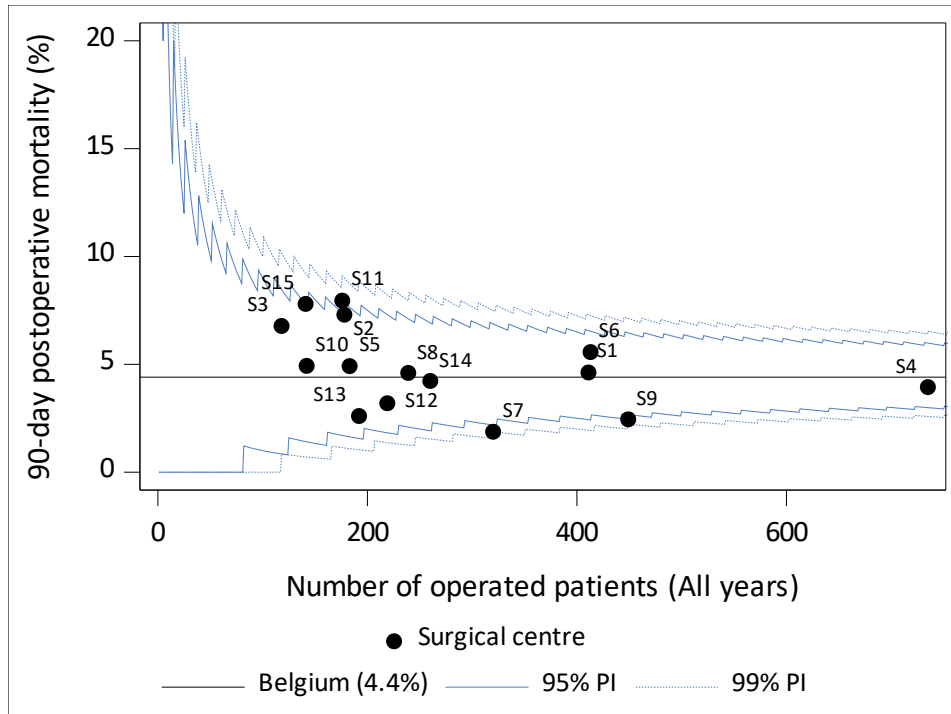
(d)



(e)



(f)



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

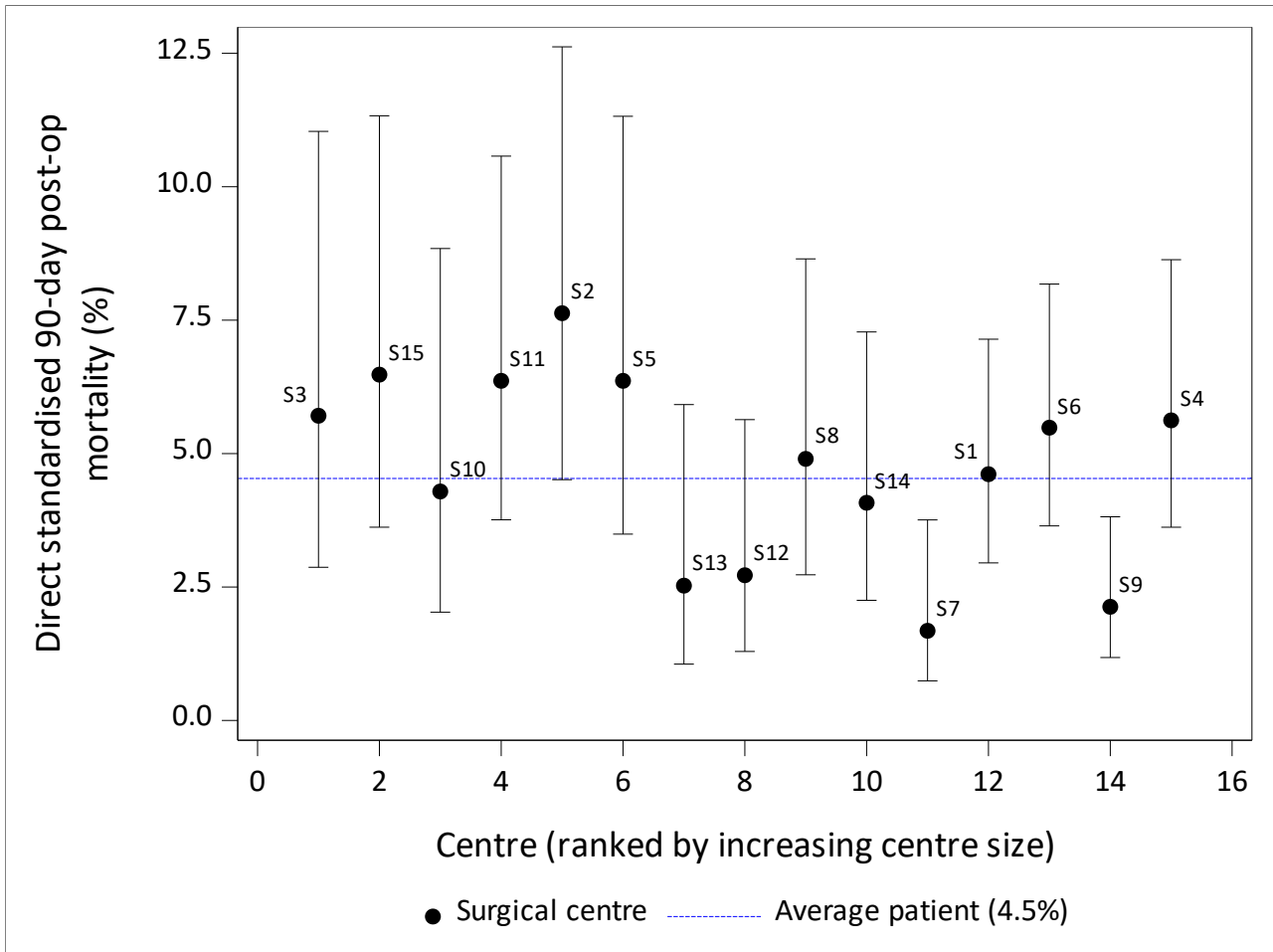
| Expert centres | Adjusted Odds Ratio | | | Standardised probability (%) | | |
|----------------|---------------------|--------------|-----------------|------------------------------|-------------|-----------------|
| | Estimate | 95% CI | Average patient | Estimate | 95% CI | Average patient |
| S1 | 1.07 | [0.66, 1.72] | 0.96 | 4.6 | [3.0, 7.1] | 4.5 |
| S2 | 1.85 | [1.05, 3.26] | 0.96 | 7.6 | [4.5, 12.6] | 4.5 |
| S3 | 1.34 | [0.66, 2.72] | 0.96 | 5.7 | [2.9, 11.0] | 4.5 |
| S4 | 1.32 | [0.80, 2.18] | 0.96 | 5.6 | [3.6, 8.6] | 4.5 |
| S5 | 1.51 | [0.81, 2.84] | 0.96 | 6.4 | [3.5, 11.3] | 4.5 |
| S6 | 1.29 | [0.82, 2.00] | 0.96 | 5.5 | [3.6, 8.2] | 4.5 |
| S7 | 0.37 | [0.17, 0.82] | 0.96 | 1.7 | [0.7, 3.8] | 4.5 |
| S8 | 1.14 | [0.62, 2.09] | 0.96 | 4.9 | [2.7, 8.6] | 4.5 |
| S9 | 0.47 | [0.26, 0.85] | 0.96 | 2.1 | [1.2, 3.8] | 4.5 |
| S10 | 0.99 | [0.46, 2.09] | 0.96 | 4.3 | [2.0, 8.8] | 4.5 |
| S11 | 1.51 | [0.87, 2.64] | 0.96 | 6.4 | [3.8, 10.6] | 4.5 |
| S12 | 0.61 | [0.29, 1.27] | 0.96 | 2.7 | [1.3, 5.6] | 4.5 |
| S13 | 0.56 | [0.24, 1.32] | 0.96 | 2.5 | [1.1, 5.9] | 4.5 |
| S14 | 0.93 | [0.51, 1.73] | 0.96 | 4.1 | [2.3, 7.3] | 4.5 |
| S15 | 1.54 | [0.84, 2.85] | 0.96 | 6.5 | [3.6, 11.3] | 4.5 |

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

This table shows the case-mix adjusted odds ratio for postoperative mortality within 90 days and the center specific direct 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 17: Direct standardised 90-day postoperative mortality 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) for malignant and benign tumours

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

| Belgium | | | | | |
|--|--------------|-------------|--------------|-------------|---------------------|
| Characteristic | N | N of deaths | Person Years | Hazard | 95% CI |
| <i>Operated patients with a malignant/benign tumour</i> | 4,176 | 668 | 3,635 | 0.18 | [0.17, 0.20] |
| <i>Expert centres</i> | | | | | |
| S1 | 411 | 74 | 352 | 0.21 | [0.17, 0.26] |
| S2 | 178 | 34 | 148 | 0.23 | [0.16, 0.32] |
| S3 | 118 | 21 | 99 | 0.21 | [0.13, 0.32] |
| S4 | 735 | 95 | 647 | 0.15 | [0.12, 0.18] |
| S5 | 183 | 22 | 162 | 0.14 | [0.09, 0.21] |
| S6 | 413 | 72 | 348 | 0.21 | [0.16, 0.26] |
| S7 | 320 | 35 | 297 | 0.12 | [0.08, 0.16] |
| S8 | 239 | 49 | 206 | 0.24 | [0.18, 0.32] |
| S9 | 449 | 71 | 399 | 0.18 | [0.14, 0.22] |
| S10 | 142 | 24 | 128 | 0.19 | [0.12, 0.28] |
| S11 | 176 | 51 | 143 | 0.36 | [0.27, 0.47] |
| S12 | 219 | 33 | 193 | 0.17 | [0.12, 0.24] |
| S13 | 192 | 19 | 170 | 0.11 | [0.07, 0.17] |
| S14 | 260 | 37 | 227 | 0.16 | [0.11, 0.23] |
| S15 | 141 | 31 | 116 | 0.27 | [0.18, 0.38] |
| <i>Convention year</i> | | | | | |
| Year 1 | 724 | 149 | 654 | 0.23 | [0.19, 0.27] |
| Year 2 | 856 | 139 | 781 | 0.18 | [0.15, 0.21] |
| Year 3 | 851 | 148 | 770 | 0.19 | [0.16, 0.23] |
| Year 4 | 834 | 133 | 764 | 0.17 | [0.15, 0.21] |
| Year 5 | 911 | 99 | 666 | 0.15 | [0.12, 0.18] |
| <i>Tumoural Pathology</i> | | | | | |
| Adenocarcinoma | 2,706 | 577 | 2,297 | 0.25 | [0.23, 0.27] |
| Neuroendocrine tumour | 535 | 28 | 487 | 0.06 | [0.04, 0.08] |
| Benign tumour | 603 | 21 | 564 | 0.04 | [0.02, 0.06] |
| Other or unspecified | 332 | 42 | 288 | 0.15 | [0.11, 0.20] |

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

| Expert Centres | 1-year observed survival after surgery, % | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|-----------|------|--------------|
| | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | | All years | | |
| | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI |
| S1 | 59 | 79.7 | [67.0, 87.9] | 60 | 73.3 | [60.2, 82.7] | 56 | 73.2 | [59.6, 82.9] | 55 | 81.8 | [68.8, 89.8] | 61 | 75.4 | [57.6, 86.6] | 291 | 77.2 | [71.7, 81.7] |
| S2 | 27 | NA ^{**} | - | 16 | NA ^{**} | - | 20 | NA ^{**} | - | 25 | NA ^{**} | - | 21 | NA ^{**} | - | 109 | 70.0 | [60.0, 77.9] |
| S3 | 15 | NA ^{**} | - | 19 | NA ^{**} | - | 20 | NA ^{**} | - | 13 | NA ^{**} | - | 20 | NA ^{**} | - | 87 | 74.9 | [63.7, 83.1] |
| S4 | 69 | 78.3 | [66.6, 86.3] | 81 | 85.0 | [75.1, 91.2] | 87 | 79.3 | [69.2, 86.4] | 94 | 81.9 | [72.5, 88.3] | 112 | 84.6 | [75.4, 90.5] | 443 | 81.7 | [77.7, 85.1] |
| S5 | 22 | NA ^{**} | - | 24 | NA ^{**} | - | 21 | NA ^{**} | - | 20 | NA ^{**} | - | 22 | NA ^{**} | - | 109 | 83.3 | [74.5, 89.3] |
| S6 | 44 | 79.5 | [64.4, 88.8] | 43 | 69.8 | [53.7, 81.2] | 69 | 72.5 | [60.3, 81.5] | 62 | 75.8 | [63.1, 84.6] | 70 | 73.6 | [54.1, 85.8] | 288 | 75.0 | [69.3, 79.9] |
| S7 | 41 | 65.9 | [49.3, 78.2] | 47 | 85.1 | [71.3, 92.6] | 36 | NA ^{**} | - | 47 | 93.6 | [81.5, 97.9] | 28 | NA ^{**} | - | 199 | 84.1 | [78.2, 88.6] |
| S8 | 29 | NA ^{**} | - | 30 | NA ^{**} | - | 30 | NA ^{**} | - | 33 | NA ^{**} | - | 37 | NA ^{**} | - | 159 | 72.1 | [64.0, 78.6] |
| S9 | 46 | 78.3 | [63.4, 87.7] | 66 | 77.3 | [65.2, 85.6] | 63 | 77.8 | [65.4, 86.2] | 59 | 78.0 | [65.1, 86.6] | 58 | 84.5 | [69.3, 92.5] | 292 | 78.8 | [73.6, 83.2] |
| S10 | 21 | NA ^{**} | - | 15 | NA ^{**} | - | 14 | NA ^{**} | - | 25 | NA ^{**} | - | 13 | NA ^{**} | - | 88 | 74.7 | [64.1, 82.5] |
| S11 | 19 | NA ^{**} | - | 36 | NA ^{**} | - | 27 | NA ^{**} | - | 23 | NA ^{**} | - | 23 | NA ^{**} | - | 128 | 62.9 | [53.6, 70.7] |
| S12 | 27 | NA ^{**} | - | 25 | NA ^{**} | - | 29 | NA ^{**} | - | 20 | NA ^{**} | - | 36 | NA ^{**} | - | 137 | 76.7 | [68.3, 83.1] |
| S13 | 18 | NA ^{**} | - | 44 | 86.4 | [72.1, 93.6] | 30 | NA ^{**} | - | 18 | NA ^{**} | - | 17 | NA ^{**} | - | 127 | 86.6 | [79.0, 91.6] |
| S14 | 24 | NA ^{**} | - | 26 | NA ^{**} | - | 35 | NA ^{**} | - | 35 | NA ^{**} | - | 45 | 85.9 | [71.0, 93.4] | 165 | 79.4 | [72.1, 85.0] |
| S15 | 15 | NA ^{**} | - | 22 | NA ^{**} | - | 15 | NA ^{**} | - | 16 | NA ^{**} | - | 16 | NA ^{**} | - | 84 | 67.5 | [56.0, 76.6] |

** N<40

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

| Expert Centres | 3-year observed survival after surgery, % | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|-------------------|-------------------|--------|-------------------|-------------------|-----------|------|--------------|
| | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | | All years | | |
| | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI |
| S1 | 59 | 42.4 | [29.7, 54.5] | 60 | 43.3 | [30.7, 55.3] | 56 | 41.4 | [27.1, 55.2] | 55 | NA ^{***} | NA ^{***} | 61 | NA ^{***} | NA ^{***} | 291 | 44.0 | [37.1, 50.7] |
| S2 | 27 | NA ^{**} | - | 16 | NA ^{**} | - | 20 | NA ^{**} | - | 25 | NA ^{***} | NA ^{***} | 21 | NA ^{***} | NA ^{***} | 109 | 42.9 | [31.8, 53.6] |
| S3 | 15 | NA ^{**} | - | 19 | NA ^{**} | - | 20 | NA ^{**} | - | 13 | NA ^{***} | NA ^{***} | 20 | NA ^{***} | NA ^{***} | 87 | 33.1 | [20.6, 46.3] |
| S4 | 69 | 46.4 | [34.3, 57.6] | 81 | 52.5 | [41.0, 62.7] | 87 | 39.3 | [28.1, 50.4] | 94 | NA ^{***} | NA ^{***} | 112 | NA ^{***} | NA ^{***} | 443 | 44.6 | [38.8, 50.3] |
| S5 | 22 | NA ^{**} | - | 24 | NA ^{**} | - | 21 | NA ^{**} | - | 20 | NA ^{***} | NA ^{***} | 22 | NA ^{***} | NA ^{***} | 109 | 62.0 | [50.1, 71.9] |
| S6 | 44 | 45.5 | [30.5, 59.3] | 43 | 48.8 | [33.3, 62.6] | 69 | 44.7 | [32.7, 56.0] | 62 | NA ^{***} | NA ^{***} | 70 | NA ^{***} | NA ^{***} | 288 | 47.2 | [39.7, 54.3] |
| S7 | 41 | 48.8 | [32.9, 62.9] | 47 | 53.2 | [38.1, 66.2] | 36 | NA ^{**} | - | 47 | NA ^{***} | NA ^{***} | 28 | NA ^{***} | NA ^{***} | 199 | 57.4 | [48.8, 65.0] |
| S8 | 29 | NA ^{**} | - | 30 | NA ^{**} | - | 30 | NA ^{**} | - | 33 | NA ^{***} | NA ^{***} | 37 | NA ^{***} | NA ^{***} | 159 | 39.0 | [29.6, 48.2] |
| S9 | 46 | 50.0 | [34.9, 63.3] | 66 | 37.9 | [26.3, 49.4] | 63 | 46.7 | [33.8, 58.6] | 59 | NA ^{***} | NA ^{***} | 58 | NA ^{***} | NA ^{***} | 292 | 43.9 | [37.0, 50.7] |
| S10 | 21 | NA ^{**} | - | 15 | NA ^{**} | - | 14 | NA ^{**} | - | 25 | NA ^{***} | NA ^{***} | 13 | NA ^{***} | NA ^{***} | 88 | 36.8 | [24.9, 48.8] |
| S11 | 19 | NA ^{**} | - | 36 | NA ^{**} | - | 27 | NA ^{**} | - | 23 | NA ^{***} | NA ^{***} | 23 | NA ^{***} | NA ^{***} | 128 | 29.0 | [20.0, 38.6] |
| S12 | 27 | NA ^{**} | - | 25 | NA ^{**} | - | 29 | NA ^{**} | - | 20 | NA ^{***} | NA ^{***} | 36 | NA ^{***} | NA ^{***} | 137 | 45.2 | [35.0, 54.8] |
| S13 | 18 | NA ^{**} | - | 44 | 61.4 | [45.4, 73.9] | 30 | NA ^{**} | - | 18 | NA ^{***} | NA ^{***} | 17 | NA ^{***} | NA ^{***} | 127 | 53.0 | [42.8, 62.2] |
| S14 | 24 | NA ^{**} | - | 26 | NA ^{**} | - | 35 | NA ^{**} | - | 35 | NA ^{***} | NA ^{***} | 45 | NA ^{***} | NA ^{***} | 165 | 48.1 | [38.6, 57.0] |
| S15 | 15 | NA ^{**} | - | 22 | NA ^{**} | - | 15 | NA ^{**} | - | 16 | NA ^{***} | NA ^{***} | 16 | NA ^{***} | NA ^{***} | 84 | 35.0 | [22.6, 47.8] |

* N<40

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

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

| Characteristic | 1-year observed survival after surgery, % | | |
|--|---|-----------------|---------------------|
| | N | Belgium | |
| | | % | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 77.5 | [75.8, 79.1] |
| Convention year | | | |
| Year 1 | 476 | 73.3 | [69.1, 77.0] |
| Year 2 | 554 | 78.4 | [74.8, 81.6] |
| Year 3 | 552 | 76.1 | [72.3, 79.4] |
| Year 4 | 545 | 78.8 | [75.1, 82.0] |
| Year 5 | 579 | 80.3 | [75.8, 84.0] |
| Sex | | | |
| Male | 1,465 | 75.8 | [73.4, 77.9] |
| Female | 1,241 | 79.5 | [77.1, 81.7] |
| Age at surgery | | | |
| <=69 | 1,412 | 83.3 | [81.1, 85.2] |
| 70-79 | 997 | 73.4 | [70.4, 76.1] |
| >=80 | 297 | 64.1 | [58.2, 69.4] |
| Lesion to treat (in (peri-)pancreas) | | | |
| Primary tumour | 2,647 | 77.3 | [75.6, 78.9] |
| Relapse of primary tumour | 26 | NA [✱] | - |
| Metastasis | 33 | NA [✱] | - |
| Primary tumour localisation | | | |
| C17.0 Duodenum | 138 | 81.9 | [74.3, 87.5] |
| C24.0 Extrahepatic bile duct | 206 | 77.2 | [70.7, 82.4] |
| C24.1 (Peri-) ampullary region | 321 | 83.9 | [79.3, 87.6] |
| C25.0 Head of pancreas | 1,343 | 73.6 | [71.1, 76.0] |
| C25.1 Body of pancreas | 239 | 83.4 | [77.8, 87.7] |
| C25.2 Tail of pancreas | 271 | 82.2 | [76.9, 86.4] |
| C25.3 Pancreatic duct | 13 | NA [✱] | - |
| C25.7-9 Other specified parts of pancreas | 104 | 70.0 | [59.9, 78.0] |
| Other | 71 | 88.1 | [77.6, 93.9] |
| Clinical stage | | | |
| 0 | 33 | NA [✱] | - |
| I | 1,374 | 78.0 | [75.6, 80.1] |
| II | 746 | 74.0 | [70.6, 77.1] |
| III | 313 | 80.3 | [75.2, 84.4] |
| IV | 64 | 75.6 | [62.7, 84.5] |
| X | 149 | 82.1 | [74.7, 87.6] |
| TNM not applicable or relapse* | 27 | NA [✱] | - |
| Pathological stage | | | |
| 0 | 43 | 97.5 | [83.5, 99.6] |

| Characteristic | 1-year observed survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| I | 459 | 84.6 | [80.8, 87.7] |
| II | 764 | 77.2 | [73.9, 80.1] |
| III | 723 | 72.1 | [68.5, 75.3] |
| IV | 60 | 62.0 | [48.2, 73.1] |
| X | 23 | NA [✱] | - |
| TNM not applicable or relapse* | 19 | NA [✱] | - |
| Neoadjuvant treatment [†] | 615 | 79.0 | [75.4, 82.1] |
| <i>y</i>Pathological stage | | | |
| 0 | 19 | NA [✱] | - |
| I | 213 | 86.2 | [80.5, 90.3] |
| II | 202 | 76.1 | [69.3, 81.5] |
| III | 137 | 74.9 | [66.3, 81.5] |
| IV | 33 | NA [✱] | - |
| X | 3 | NA [✱] | - |
| TNM not applicable or relapse* | 8 | NA [✱] | - |
| No neoadjuvant treatment | 2,091 | 77.0 | [75.1, 78.8] |
| Resection margin | | | |
| R0 | 1,850 | 81.2 | [79.3, 82.9] |
| R1 | 846 | 69.6 | [66.3, 72.7] |
| R2 | 10 | NA [✱] | - |
| Prior surgery or other treatment ** | | | |
| Prior abdominal surgery | 407 | 77.7 | [73.2, 81.5] |
| Other treatment modality (that could affect the pancreas) | 476 | 79.2 | [75.1, 82.7] |
| Neoadjuvant treatment | | | |
| Chemoradiotherapy | 85 | 74.4 | [63.1, 82.7] |
| Chemotherapy | 528 | 79.9 | [76.0, 83.2] |
| Radiotherapy | 2 | NA [✱] | - |
| No chemo or radiation treatment | 2,091 | 77.0 | [75.1, 78.8] |
| Charlson Comorbidity Index | | | |
| 0 | 1,067 | 82.6 | [80.1, 84.8] |
| 1 | 679 | 74.7 | [71.2, 77.9] |
| 2 | 436 | 75.0 | [70.6, 78.9] |
| 3 | 231 | 75.8 | [69.5, 80.9] |
| 4 | 140 | 70.4 | [61.7, 77.4] |
| 5 | 64 | 68.3 | [54.7, 78.5] |
| 6 | 36 | NA [✱] | - |
| 7 | 28 | NA [✱] | - |
| 8 | 14 | NA [✱] | - |
| 9 | 8 | NA [✱] | - |
| 10 | 3 | NA [✱] | - |
| WHO score at surgery | | | |
| 0 - Asymptomatic, normal activity | 625 | 82.6 | [79.3, 85.5] |

| Characteristic | 1-year observed survival after surgery, % | | |
|--|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| 1 - Symptomatic, but ambulant | 1,736 | 78.3 | [76.3, 80.3] |
| 2 - Symptomatic, bedbound < 50% day | 288 | 65.3 | [59.3, 70.6] |
| 3 - Symptomatic, bedbound > 50% day | 55 | 58.1 | [43.4, 70.2] |
| 4 - Completely dependent, 100% bedbound | 2 | NA [✱] | - |
| ASA score | | | |
| 1 - Healthy person | 140 | 82.8 | [75.4, 88.1] |
| 2 - Mild systemic disease, normal activity | 1,377 | 79.9 | [77.6, 82.0] |
| 3 - Serious systemic disease, limited activity | 1,152 | 74.0 | [71.3, 76.6] |
| 4 - Life-threatening illness, handicapped | 37 | NA [✱] | - |
| Resectability status ^{**} | | | |
| Before neoadjuvant treatment | | | |
| Upfront resectable | 110 | 84.9 | [76.2, 90.7] |
| Borderline resectable | 305 | 79.7 | [74.4, 83.9] |
| Unresectable | 74 | 81.3 | [69.9, 88.7] |
| No neoadjuvant treatment | 1,502 | 78.5 | [76.2, 80.6] |
| Before surgery | | | |
| Upfront resectable | 1,645 | 79.0 | [76.9, 81.0] |
| Borderline resectable | 319 | 79.1 | [73.9, 83.3] |
| Unresectable | 21 | NA [✱] | - |
| Missing | 6 | NA [✱] | - |
| Type of surgery | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 595 | 82.8 | [79.4, 85.7] |
| Minimally invasive surgery (MIS) - Hybrid | 2 | NA [✱] | - |
| Minimally invasive surgery (MIS) - Robotic | 241 | 78.3 | [72.1, 83.3] |
| Open | 1,739 | 76.1 | [73.9, 78.1] |
| Conversion from MIS to open surgery | 129 | 71.3 | [62.5, 78.4] |
| Simultaneous venous resection | | | |
| No | 2,242 | 79.5 | [77.7, 81.2] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 464 | 67.7 | [63.1, 71.9] |
| - With primary wedge-reconstruction | 152 | 69.4 | [61.0, 76.3] |
| - With primary end-to-end reconstruction | 193 | 66.6 | [59.3, 72.9] |
| - With vascular autograft interposition | 10 | NA [✱] | - |
| - With vascular allograft interposition | 54 | 65.1 | [49.5, 76.9] |
| - With synthetic/prosthetic interposition | 7 | NA [✱] | - |
| - With peritoneal patch wedge-reconstruction | 39 | NA [✱] | - |
| - Without reconstruction | 9 | NA [✱] | - |
| Simultaneous arterial resection ^{**} | | | |
| No | 2,639 | 77.4 | [75.6, 79.0] |
| Hepatic artery resection | 27 | NA [✱] | - |
| - With primary end-to-end reconstruction | 16 | NA [✱] | - |
| - With vascular allograft interposition | 1 | NA [✱] | - |

| Characteristic | 1-year observed survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| - Without reconstruction | 10 | NA [‡] | - |
| Coeliac trunk resection | 32 | NA [‡] | - |
| - With primary end-to-end reconstruction | 2 | NA [‡] | - |
| - Without reconstruction | 30 | NA [‡] | - |
| Superior mesenteric artery (SMA) resection | 7 | NA [‡] | - |
| - With primary wedge-reconstruction | 1 | NA [‡] | - |
| - With primary end-to-end reconstruction | 3 | NA [‡] | - |
| - With vascular autograft interposition | 2 | NA [‡] | - |
| - Without reconstruction | 1 | NA [‡] | - |
| Simultaneous other organ resection ** | | | |
| No | 1,648 | 77.1 | [74.9, 79.1] |
| Colon | 84 | 68.7 | [57.2, 77.7] |
| Stomach | 477 | 76.8 | [72.6, 80.5] |
| Adrenal gland | 71 | 82.0 | [70.4, 89.4] |
| Spleen | 506 | 80.6 | [76.7, 83.9] |
| Other | 166 | 74.0 | [66.3, 80.1] |
| RIZIV code for complex surgery | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,139 | 76.2 | [74.2, 78.0] |
| Pancreaticoduodenectomy | 1,975 | 76.8 | [74.8, 78.7] |
| Total Pancreatectomy | 164 | 68.2 | [60.2, 74.9] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 183 | 83.7 | [77.4, 88.4] |
| 242874-242885: Hemipancreatectomy left | 382 | 82.3 | [77.9, 86.0] |
| 242896-242900: Enucleation of a pancreatic tumour | 2 | NA [‡] | - |
| Antithrombotic medication | | | |
| No | 1,865 | 79.6 | [77.6, 81.4] |
| Yes | 841 | 72.9 | [69.7, 75.9] |
| Was the patient referred? | | | |
| No | 1,105 | 79.3 | [76.7, 81.6] |
| Yes | 1,601 | 76.3 | [74.0, 78.3] |

* Tumour staging not possible.

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

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

‡ N<40

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

| Characteristic | 3-year observed survival after surgery, % | | |
|--|---|-------------------|---------------------|
| | N | Belgium | |
| | | % | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 45.1 | [42.8, 47.4] |
| Convention year | | | |
| Year 1 | 476 | 45.7 | [41.2, 50.1] |
| Year 2 | 554 | 45.5 | [41.3, 49.6] |
| Year 3 | 552 | 41.7 | [37.2, 46.1] |
| Year 4 | 545 | NA ^{***} | NA ^{***} |
| Year 5 | 579 | NA ^{***} | NA ^{***} |
| Sex | | | |
| Male | 1,465 | 43.5 | [40.4, 46.6] |
| Female | 1,241 | 46.9 | [43.5, 50.3] |
| Age at surgery | | | |
| <=69 | 1,412 | 49.0 | [45.7, 52.1] |
| 70-79 | 997 | 43.7 | [40.0, 47.4] |
| >=80 | 297 | 31.5 | [25.2, 38.0] |
| Lesion to treat (in (peri-)pancreas) | | | |
| Primary tumour | 2,647 | 44.6 | [42.3, 46.9] |
| Relapse of primary tumour | 26 | NA ^{**} | - |
| Metastasis | 33 | NA ^{**} | - |
| Primary tumour localisation | | | |
| C17.0 Duodenum | 138 | 66.0 | [56.1, 74.3] |
| C24.0 Extrahepatic bile duct | 206 | 43.8 | [35.9, 51.4] |
| C24.1 (Peri-) ampullary region | 321 | 62.5 | [55.8, 68.4] |
| C25.0 Head of pancreas | 1,343 | 37.2 | [34.0, 40.4] |
| C25.1 Body of pancreas | 239 | 47.9 | [39.4, 55.8] |
| C25.2 Tail of pancreas | 271 | 43.6 | [36.1, 50.8] |
| C25.3 Pancreatic duct | 13 | NA ^{**} | - |
| C25.7-9 Other specified parts of pancreas | 104 | 43.7 | [32.9, 54.1] |
| Other | 71 | 74.3 | [60.7, 83.8] |
| Clinical stage | | | |
| 0 | 33 | NA ^{**} | - |
| I | 1,374 | 47.9 | [44.7, 51.1] |
| II | 746 | 37.9 | [33.7, 42.1] |
| III | 313 | 41.1 | [34.2, 47.9] |
| IV | 64 | 44.4 | [29.4, 58.4] |
| X | 149 | 55.9 | [46.7, 64.2] |
| TNM not applicable or relapse* | 27 | NA ^{**} | - |
| Pathological stage | | | |
| 0 | 43 | 94.9 | [81.0, 98.7] |

| Characteristic | 3-year observed survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| I | 459 | 67.4 | [62.1, 72.1] |
| II | 764 | 44.2 | [39.9, 48.4] |
| III | 723 | 34.4 | [30.2, 38.7] |
| IV | 60 | 26.3 | [14.9, 39.2] |
| X | 23 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 19 | NA [Ⓚ] | - |
| Neoadjuvant treatment [†] | 615 | 39.1 | [34.2, 44.1] |
| <i>y</i>Pathological stage | | | |
| 0 | 19 | NA [Ⓚ] | - |
| I | 213 | 52.9 | [43.8, 61.3] |
| II | 202 | 31.6 | [23.8, 39.6] |
| III | 137 | 28.8 | [19.3, 38.9] |
| IV | 33 | NA [Ⓚ] | - |
| X | 3 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 8 | NA [Ⓚ] | - |
| No neoadjuvant treatment | 2,091 | 46.7 | [44.1, 49.2] |
| <i>Resection margin</i> | | | |
| R0 | 1,850 | 51.5 | [48.8, 54.2] |
| R1 | 846 | 31.0 | [27.2, 35.0] |
| R2 | 10 | NA [Ⓚ] | - |
| <i>Prior surgery or other treatment</i> ** | | | |
| Prior abdominal surgery | 407 | 45.0 | [39.2, 50.7] |
| Other treatment modality (that could affect the pancreas) | 476 | 42.9 | [37.3, 48.5] |
| <i>Neoadjuvant treatment</i> | | | |
| Chemoradiotherapy | 85 | 53.5 | [39.4, 65.8] |
| Chemotherapy | 528 | 37.3 | [32.0, 42.6] |
| Radiotherapy | 2 | NA [Ⓚ] | - |
| No chemo or radiation treatment | 2,091 | 46.7 | [44.1, 49.2] |
| <i>Charlson Comorbidity Index</i> | | | |
| 0 | 1,067 | 53.0 | [49.3, 56.5] |
| 1 | 679 | 41.0 | [36.5, 45.5] |
| 2 | 436 | 40.6 | [35.0, 46.2] |
| 3 | 231 | 39.4 | [31.8, 46.9] |
| 4 | 140 | 34.1 | [24.5, 43.9] |
| 5 | 64 | 37.9 | [23.6, 52.0] |
| 6 | 36 | NA [Ⓚ] | - |
| 7 | 28 | NA [Ⓚ] | - |
| 8 | 14 | NA [Ⓚ] | - |
| 9 | 8 | NA [Ⓚ] | - |
| 10 | 3 | NA [Ⓚ] | - |
| <i>WHO score at surgery</i> | | | |
| 0 - Asymptomatic, normal activity | 625 | 50.4 | [45.5, 55.0] |

| Characteristic | 3-year observed survival after surgery, % | | |
|--|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| 1 - Symptomatic, but ambulant | 1,736 | 46.0 | [43.2, 48.8] |
| 2 - Symptomatic, bedbound < 50% day | 288 | 32.1 | [25.5, 38.9] |
| 3 - Symptomatic, bedbound > 50% day | 55 | 27.5 | [14.3, 42.4] |
| 4 - Completely dependent, 100% bedbound | 2 | NA [✱] | - |
| ASA score | | | |
| 1 - Healthy person | 140 | 54.6 | [45.2, 62.9] |
| 2 - Mild systemic disease, normal activity | 1,377 | 49.2 | [45.9, 52.3] |
| 3 - Serious systemic disease, limited activity | 1,152 | 39.1 | [35.5, 42.6] |
| 4 - Life-threatening illness, handicapped | 37 | NA [✱] | - |
| Resectability status ^{**} | | | |
| Before neoadjuvant treatment | | | |
| Upfront resectable | 110 | 39.1 | [25.6, 52.3] |
| Borderline resectable | 305 | 39.2 | [30.8, 47.5] |
| Unresectable | 74 | 36.0 | [21.3, 50.9] |
| No neoadjuvant treatment | 1,502 | 46.8 | [43.4, 50.2] |
| Before surgery | | | |
| Upfront resectable | 1,645 | 46.8 | [43.5, 50.0] |
| Borderline resectable | 319 | 38.1 | [30.6, 45.6] |
| Unresectable | 21 | NA [✱] | - |
| Missing | 6 | NA [✱] | - |
| Type of surgery | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 595 | 50.0 | [45.1, 54.8] |
| Minimally invasive surgery (MIS) - Hybrid | 2 | NA [✱] | - |
| Minimally invasive surgery (MIS) - Robotic | 241 | 42.5 | [33.4, 51.2] |
| Open | 1,739 | 44.8 | [42.0, 47.6] |
| Conversion from MIS to open surgery | 129 | 29.6 | [20.5, 39.3] |
| Simultaneous venous resection | | | |
| No | 2,242 | 48.6 | [46.1, 51.1] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 464 | 27.6 | [22.6, 32.8] |
| - With primary wedge-reconstruction | 152 | 23.3 | [14.8, 33.0] |
| - With primary end-to-end reconstruction | 193 | 31.1 | [23.5, 38.9] |
| - With vascular autograft interposition | 10 | NA [✱] | - |
| - With vascular allograft interposition | 54 | 19.8 | [6.9, 37.6] |
| - With synthetic/prosthetic interposition | 7 | NA [✱] | - |
| - With peritoneal patch wedge-reconstruction | 39 | NA [✱] | - |
| - Without reconstruction | 9 | NA [✱] | - |
| Simultaneous arterial resection ^{**} | | | |
| No | 2,639 | 45.4 | [43.1, 47.7] |
| Hepatic artery resection | 27 | NA [✱] | - |
| - With primary end-to-end reconstruction | 16 | NA [✱] | - |
| - With vascular allograft interposition | 1 | NA [✱] | - |

| 3-year observed survival after surgery, % | | | |
|---|-------|-----------------|--------------|
| Characteristic | N | Belgium | |
| | | % | 95% CI |
| - Without reconstruction | 10 | NA [✱] | - |
| Coeliac trunk resection | 32 | NA [✱] | - |
| - With primary end-to-end reconstruction | 2 | NA [✱] | - |
| - Without reconstruction | 30 | NA [✱] | - |
| Superior mesenteric artery (SMA) resection | 7 | NA [✱] | - |
| - With primary wedge-reconstruction | 1 | NA [✱] | - |
| - With primary end-to-end reconstruction | 3 | NA [✱] | - |
| - With vascular autograft interposition | 2 | NA [✱] | - |
| - Without reconstruction | 1 | NA [✱] | - |
| Simultaneous other organ resection ** | | | |
| No | 1,648 | 45.6 | [42.7, 48.4] |
| Colon | 84 | 39.5 | [26.5, 52.2] |
| Stomach | 477 | 41.6 | [36.0, 47.1] |
| Adrenal gland | 71 | 34.9 | [21.5, 48.7] |
| Spleen | 506 | 44.3 | [38.7, 49.8] |
| Other | 166 | 46.5 | [37.7, 54.8] |
| RIZIV code for complex surgery | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,139 | 44.8 | [42.2, 47.3] |
| Pancreaticoduodenectomy | 1,975 | 44.9 | [42.2, 47.5] |
| Total Pancreatectomy | 164 | 44.2 | [34.7, 53.2] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 183 | 45.8 | [36.7, 54.4] |
| 242874-242885: Hemipancreatectomy left | 382 | 46.9 | [40.4, 53.1] |
| 242896-242900: Enucleation of a pancreatic tumour | 2 | NA [✱] | - |
| Antithrombotic medication | | | |
| No | 1,865 | 47.8 | [45.0, 50.5] |
| Yes | 841 | 39.1 | [35.1, 43.1] |
| Was the patient referred? | | | |
| No | 1,105 | 45.8 | [42.2, 49.3] |
| Yes | 1,601 | 44.6 | [41.6, 47.5] |

* Tumour staging not possible.

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

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

✱ N<40

✱✱✱ 3-year follow-up after surgery is not reached.

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

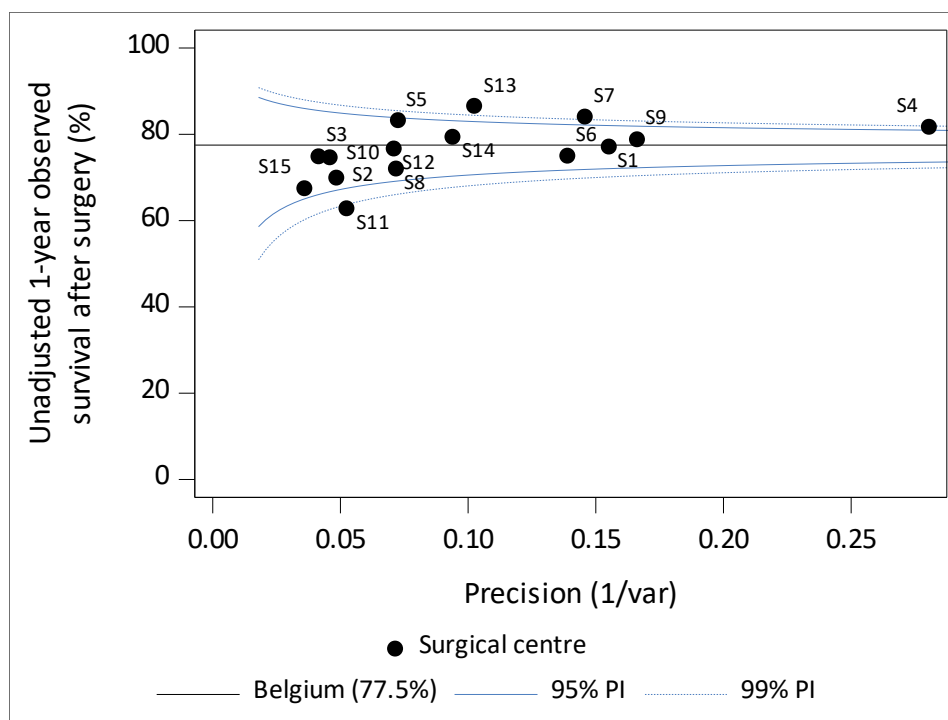
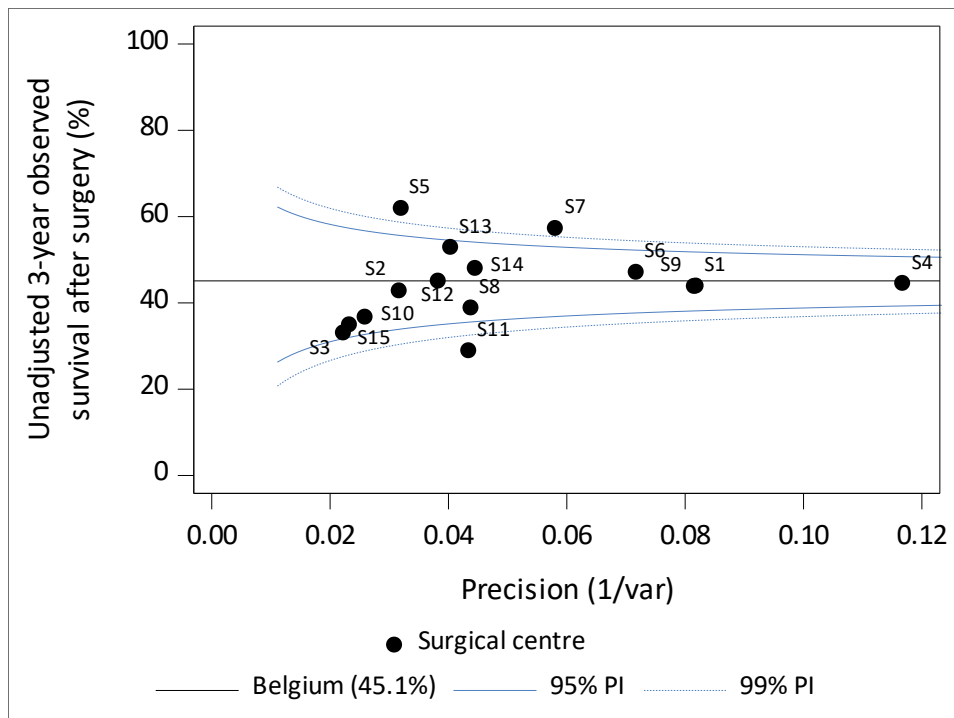


Figure 19: Unadjusted 3-year observed survival after surgery for **adenocarcinoma**, death by all causes, for all years combined.



3.3.2.2. Unadjusted relative survival after surgery for adenocarcinoma

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

| Expert Centres | 1-year relative survival after surgery, % | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|-----------|------|--------------|
| | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | | All years | | |
| | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI |
| S1 | 59 | 81.7 | [68.9, 90.0] | 60 | 74.9 | [61.5, 84.6] | 56 | 75.2 | [61.1, 85.2] | 55 | 83.5 | [70.4, 91.6] | 61 | 81.5 | [66.9, 90.6] | 291 | 79.3 | [73.8, 83.9] |
| S2 | 27 | NA ^{**} | - | 16 | NA ^{**} | - | 20 | NA ^{**} | - | 25 | NA ^{**} | - | 21 | NA ^{**} | - | 109 | 71.3 | [61.2, 79.4] |
| S3 | 15 | NA ^{**} | - | 19 | NA ^{**} | - | 20 | NA ^{**} | - | 13 | NA ^{**} | - | 20 | NA ^{**} | - | 87 | 77.2 | [66.0, 85.3] |
| S4 | 69 | 80.0 | [68.3, 88.1] | 81 | 86.4 | [76.3, 92.6] | 87 | 80.3 | [69.9, 87.6] | 94 | 83.5 | [73.9, 90.1] | 112 | 84.5 | [74.8, 90.9] | 443 | 83.0 | [78.9, 86.5] |
| S5 | 22 | NA ^{**} | - | 24 | NA ^{**} | - | 21 | NA ^{**} | - | 20 | NA ^{**} | - | 22 | NA ^{**} | - | 109 | 85.8 | [77.2, 91.6] |
| S6 | 44 | NA ^{**} | - | 43 | NA ^{**} | - | 69 | 73.9 | [61.5, 83.0] | 62 | 77.0 | [64.0, 86.2] | 70 | 82.7 | [69.0, 91.2] | 288 | 77.3 | [71.7, 82.1] |
| S7 | 41 | NA ^{**} | - | 47 | NA ^{**} | - | 36 | NA ^{**} | - | 47 | NA ^{**} | - | 28 | NA ^{**} | - | 199 | 86.3 | [80.4, 90.8] |
| S8 | 29 | NA ^{**} | - | 30 | NA ^{**} | - | 30 | NA ^{**} | - | 33 | NA ^{**} | - | 37 | NA ^{**} | - | 159 | 75.8 | [67.9, 82.2] |
| S9 | 46 | NA ^{**} | - | 66 | 79.1 | [66.6, 87.7] | 63 | 80.3 | [67.9, 88.6] | 59 | 79.9 | [66.8, 88.7] | 58 | 86.8 | [72.7, 94.4] | 292 | 81.1 | [75.8, 85.4] |
| S10 | 21 | NA ^{**} | - | 15 | NA ^{**} | - | 14 | NA ^{**} | - | 25 | NA ^{**} | - | 13 | NA ^{**} | - | 88 | 76.7 | [66.1, 84.6] |
| S11 | 19 | NA ^{**} | - | 36 | NA ^{**} | - | 27 | NA ^{**} | - | 23 | NA ^{**} | - | 23 | NA ^{**} | - | 128 | 64.8 | [55.5, 72.7] |
| S12 | 27 | NA ^{**} | - | 25 | NA ^{**} | - | 29 | NA ^{**} | - | 20 | NA ^{**} | - | 36 | NA ^{**} | - | 137 | 79.0 | [70.7, 85.5] |
| S13 | 18 | NA ^{**} | - | 44 | NA ^{**} | - | 30 | NA ^{**} | - | 18 | NA ^{**} | - | 17 | NA ^{**} | - | 127 | 89.0 | [81.4, 94.1] |
| S14 | 24 | NA ^{**} | - | 26 | NA ^{**} | - | 35 | NA ^{**} | - | 35 | NA ^{**} | - | 45 | NA ^{**} | - | 165 | 81.5 | [74.1, 87.2] |
| S15 | 15 | NA ^{**} | - | 22 | NA ^{**} | - | 15 | NA ^{**} | - | 16 | NA ^{**} | - | 16 | NA ^{**} | - | 84 | 68.6 | [56.8, 77.9] |

^{**} N<50

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

| Expert Centres | 3-year relative survival after surgery, % | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|--------------|--------|------------------|--------------|--------|------------------|--------------|--------|-------------------|-------------------|--------|-------------------|-------------------|-----------|------|--------------|
| | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | | All years | | |
| | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI | N | % | 95% CI |
| S1 | 59 | 45.2 | [31.7, 58.2] | 60 | 48.2 | [34.5, 61.0] | 56 | 46.5 | [31.9, 60.5] | 55 | NA ^{***} | NA ^{***} | 61 | NA ^{***} | NA ^{***} | 291 | 48.6 | [41.2, 55.6] |
| S2 | 27 | NA ^{**} | - | 16 | NA ^{**} | - | 20 | NA ^{**} | - | 25 | NA ^{***} | NA ^{***} | 21 | NA ^{***} | NA ^{***} | 109 | 45.5 | [33.6, 56.9] |
| S3 | 15 | NA ^{**} | - | 19 | NA ^{**} | - | 20 | NA ^{**} | - | 13 | NA ^{***} | NA ^{***} | 20 | NA ^{***} | NA ^{***} | 87 | 37.5 | [24.2, 51.1] |
| S4 | 69 | 49.4 | [36.7, 61.3] | 81 | 55.8 | [43.8, 66.4] | 87 | 41.2 | [30.0, 52.3] | 94 | NA ^{***} | NA ^{***} | 112 | NA ^{***} | NA ^{***} | 443 | 46.7 | [40.6, 52.6] |
| S5 | 22 | NA ^{**} | - | 24 | NA ^{**} | - | 21 | NA ^{**} | - | 20 | NA ^{***} | NA ^{***} | 22 | NA ^{***} | NA ^{***} | 109 | 66.9 | [54.4, 77.2] |
| S6 | 44 | NA ^{**} | - | 43 | NA ^{**} | - | 69 | 46.2 | [33.2, 58.5] | 62 | NA ^{***} | NA ^{***} | 70 | NA ^{***} | NA ^{***} | 288 | 51.4 | [43.5, 58.8] |
| S7 | 41 | NA ^{**} | - | 47 | NA ^{**} | - | 36 | NA ^{**} | - | 47 | NA ^{***} | NA ^{***} | 28 | NA ^{***} | NA ^{***} | 199 | 61.7 | [52.6, 69.9] |
| S8 | 29 | NA ^{**} | - | 30 | NA ^{**} | - | 30 | NA ^{**} | - | 33 | NA ^{***} | NA ^{***} | 37 | NA ^{***} | NA ^{***} | 159 | 43.2 | [33.1, 53.2] |
| S9 | 46 | NA ^{**} | - | 66 | 39.2 | [26.9, 51.7] | 63 | 48.7 | [34.6, 61.8] | 59 | NA ^{***} | NA ^{***} | 58 | NA ^{***} | NA ^{***} | 292 | 45.9 | [38.4, 53.1] |
| S10 | 21 | NA ^{**} | - | 15 | NA ^{**} | - | 14 | NA ^{**} | - | 25 | NA ^{***} | NA ^{***} | 13 | NA ^{***} | NA ^{***} | 88 | 39.0 | [26.4, 51.7] |
| S11 | 19 | NA ^{**} | - | 36 | NA ^{**} | - | 27 | NA ^{**} | - | 23 | NA ^{***} | NA ^{***} | 23 | NA ^{***} | NA ^{***} | 128 | 31.0 | [21.1, 41.6] |
| S12 | 27 | NA ^{**} | - | 25 | NA ^{**} | - | 29 | NA ^{**} | - | 20 | NA ^{***} | NA ^{***} | 36 | NA ^{***} | NA ^{***} | 137 | 47.6 | [36.6, 58.1] |
| S13 | 18 | NA ^{**} | - | 44 | NA ^{**} | - | 30 | NA ^{**} | - | 18 | NA ^{***} | NA ^{***} | 17 | NA ^{***} | NA ^{***} | 127 | 58.0 | [47.0, 67.8] |
| S14 | 24 | NA ^{**} | - | 26 | NA ^{**} | - | 35 | NA ^{**} | - | 35 | NA ^{***} | NA ^{***} | 45 | NA ^{***} | NA ^{***} | 165 | 50.9 | [40.6, 60.6] |
| S15 | 15 | NA ^{**} | - | 22 | NA ^{**} | - | 15 | NA ^{**} | - | 16 | NA ^{***} | NA ^{***} | 16 | NA ^{***} | NA ^{***} | 84 | 38.6 | [25.8, 51.5] |

* N<50

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

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

| Characteristic | 1-year relative survival after surgery, % | | |
|--|---|-----------------|---------------------|
| | N | Belgium | |
| | | % | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 79.6 | [77.9, 81.1] |
| Convention year | | | |
| Year 1 | 476 | 75.4 | [71.1, 79.1] |
| Year 2 | 554 | 80.2 | [76.5, 83.5] |
| Year 3 | 552 | 77.9 | [74.0, 81.3] |
| Year 4 | 545 | 80.7 | [77.0, 84.0] |
| Year 5 | 579 | 83.7 | [79.8, 87.0] |
| Sex | | | |
| Male | 1,465 | 78.2 | [75.9, 80.4] |
| Female | 1,241 | 81.1 | [78.7, 83.3] |
| Age at surgery | | | |
| <=69 | 1,412 | 84.4 | [82.3, 86.3] |
| 70-79 | 997 | 75.6 | [72.6, 78.3] |
| >=80 | 297 | 69.2 | [63.0, 74.8] |
| Lesion to treat (in (peri-)pancreas) | | | |
| Primary tumour | 2,647 | 79.4 | [77.6, 81.0] |
| Relapse of primary tumour | 26 | NA [Ⓚ] | - |
| Metastasis | 33 | NA [Ⓚ] | - |
| Primary tumour localisation | | | |
| C17.0 Duodenum | 138 | 83.7 | [75.8, 89.5] |
| C24.0 Extrahepatic bile duct | 206 | 79.3 | [72.7, 84.7] |
| C24.1 (Peri-) ampullary region | 321 | 85.8 | [81.0, 89.7] |
| C25.0 Head of pancreas | 1,343 | 75.8 | [73.3, 78.1] |
| C25.1 Body of pancreas | 239 | 85.4 | [79.7, 89.7] |
| C25.2 Tail of pancreas | 271 | 84.7 | [79.5, 88.8] |
| C25.3 Pancreatic duct | 13 | NA [Ⓚ] | - |
| C25.7-9 Other specified parts of pancreas | 104 | 72.4 | [62.3, 80.3] |
| Other | 71 | 89.1 | [78.3, 95.1] |
| Clinical stage | | | |
| 0 | 33 | NA [Ⓚ] | - |
| I | 1,374 | 80.2 | [77.8, 82.4] |
| II | 746 | 76.0 | [72.6, 79.1] |
| III | 313 | 81.8 | [76.7, 85.9] |
| IV | 64 | 77.0 | [64.3, 85.9] |
| X | 149 | 84.5 | [77.2, 89.9] |
| TNM not applicable or relapse* | 27 | NA [Ⓚ] | - |
| Pathological stage | | | |
| 0 | 43 | NA [Ⓚ] | - |

| Characteristic | 1-year relative survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| I | 459 | 86.9 | [83.1, 90.0] |
| II | 764 | 79.4 | [76.1, 82.3] |
| III | 723 | 73.7 | [70.1, 76.9] |
| IV | 60 | 65.2 | [51.6, 76.0] |
| X | 23 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 19 | NA [Ⓚ] | - |
| Neoadjuvant treatment [†] | 615 | 81.3 | [77.9, 84.3] |
| <i>y</i>Pathological stage | | | |
| 0 | 19 | NA [Ⓚ] | - |
| I | 213 | 88.4 | [82.9, 92.3] |
| II | 202 | 78.0 | [71.4, 83.4] |
| III | 137 | 77.8 | [69.7, 84.1] |
| IV | 33 | NA [Ⓚ] | - |
| X | 3 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 8 | NA [Ⓚ] | - |
| No neoadjuvant treatment | 2,091 | 79.0 | [77.1, 80.8] |
| <i>Resection margin</i> | | | |
| R0 | 1,850 | 83.1 | [81.2, 84.9] |
| R1 | 846 | 72.1 | [68.8, 75.2] |
| R2 | 10 | NA [Ⓚ] | - |
| <i>Prior surgery or other treatment</i> ** | | | |
| Prior abdominal surgery | 407 | 79.4 | [74.8, 83.3] |
| Other treatment modality (that could affect the pancreas) | 476 | 80.7 | [76.5, 84.3] |
| <i>Neoadjuvant treatment</i> | | | |
| Chemoradiotherapy | 85 | 76.7 | [65.7, 84.7] |
| Chemotherapy | 528 | 82.2 | [78.5, 85.3] |
| Radiotherapy | 2 | NA [Ⓚ] | - |
| No chemo or radiation treatment | 2,091 | 79.0 | [77.1, 80.8] |
| <i>Charlson Comorbidity Index</i> | | | |
| 0 | 1,067 | 84.6 | [82.1, 86.8] |
| 1 | 679 | 76.5 | [72.9, 79.8] |
| 2 | 436 | 77.2 | [72.7, 81.2] |
| 3 | 231 | 78.1 | [71.7, 83.3] |
| 4 | 140 | 73.9 | [65.2, 80.9] |
| 5 | 64 | 70.8 | [57.2, 81.2] |
| 6 | 36 | NA [Ⓚ] | - |
| 7 | 28 | NA [Ⓚ] | - |
| 8 | 14 | NA [Ⓚ] | - |
| 9 | 8 | NA [Ⓚ] | - |
| 10 | 3 | NA [Ⓚ] | - |
| <i>WHO score at surgery</i> | | | |
| 0 - Asymptomatic, normal activity | 625 | 84.5 | [81.2, 87.3] |

| Characteristic | 1-year relative survival after surgery, % | | |
|--|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| 1 - Symptomatic, but ambulant | 1,736 | 80.5 | [78.4, 82.4] |
| 2 - Symptomatic, bedbound < 50% day | 288 | 67.4 | [61.3, 72.8] |
| 3 - Symptomatic, bedbound > 50% day | 55 | 59.1 | [44.4, 71.4] |
| 4 - Completely dependent, 100% bedbound | 2 | NA [✱] | - |
| ASA score | | | |
| 1 - Healthy person | 140 | 84.1 | [76.7, 89.4] |
| 2 - Mild systemic disease, normal activity | 1,377 | 82.0 | [79.7, 84.1] |
| 3 - Serious systemic disease, limited activity | 1,152 | 76.2 | [73.5, 78.7] |
| 4 - Life-threatening illness, handicapped | 37 | NA [✱] | - |
| Resectability status ^{**} | | | |
| Before neoadjuvant treatment | | | |
| Upfront resectable | 110 | 87.2 | [78.8, 92.7] |
| Borderline resectable | 305 | 81.8 | [76.7, 86.0] |
| Unresectable | 74 | 82.5 | [71.2, 89.9] |
| No neoadjuvant treatment | 1,502 | 80.4 | [78.1, 82.5] |
| Before surgery | | | |
| Upfront resectable | 1,645 | 81.0 | [78.8, 83.0] |
| Borderline resectable | 319 | 81.0 | [75.9, 85.1] |
| Unresectable | 21 | NA [✱] | - |
| Missing | 6 | NA [✱] | - |
| Type of surgery | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 595 | 84.8 | [81.4, 87.6] |
| Minimally invasive surgery (MIS) - Hybrid | 2 | NA [✱] | - |
| Minimally invasive surgery (MIS) - Robotic | 241 | 80.3 | [74.0, 85.3] |
| Open | 1,739 | 78.2 | [76.1, 80.2] |
| Conversion from MIS to open surgery | 129 | 72.0 | [62.9, 79.4] |
| Simultaneous venous resection | | | |
| No | 2,242 | 81.6 | [79.8, 83.3] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 464 | 70.0 | [65.4, 74.1] |
| - With primary wedge-reconstruction | 152 | 71.6 | [63.3, 78.5] |
| - With primary end-to-end reconstruction | 193 | 69.0 | [61.8, 75.2] |
| - With vascular autograft interposition | 10 | NA [✱] | - |
| - With vascular allograft interposition | 54 | 66.2 | [51.0, 77.9] |
| - With synthetic/prosthetic interposition | 7 | NA [✱] | - |
| - With peritoneal patch wedge-reconstruction | 39 | NA [✱] | - |
| - Without reconstruction | 9 | NA [✱] | - |
| Simultaneous arterial resection ^{**} | | | |
| No | 2,639 | 79.4 | [77.7, 81.0] |
| Hepatic artery resection | 27 | NA [✱] | - |
| - With primary end-to-end reconstruction | 16 | NA [✱] | - |
| - With vascular allograft interposition | 1 | NA [✱] | - |

| Characteristic | 1-year relative survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| - Without reconstruction | 10 | NA [⋆] | - |
| Coeliac trunk resection | 32 | NA [⋆] | - |
| - With primary end-to-end reconstruction | 2 | NA [⋆] | - |
| - Without reconstruction | 30 | NA [⋆] | - |
| Superior mesenteric artery (SMA) resection | 7 | NA [⋆] | - |
| - With primary wedge-reconstruction | 1 | NA [⋆] | - |
| - With primary end-to-end reconstruction | 3 | NA [⋆] | - |
| - With vascular autograft interposition | 2 | NA [⋆] | - |
| - Without reconstruction | 1 | NA [⋆] | - |
| Simultaneous other organ resection ** | | | |
| No | 1,648 | 79.1 | [76.9, 81.1] |
| Colon | 84 | 69.9 | [58.3, 79.0] |
| Stomach | 477 | 78.9 | [74.6, 82.5] |
| Adrenal gland | 71 | 84.6 | [73.3, 91.7] |
| Spleen | 506 | 82.7 | [78.8, 86.0] |
| Other | 166 | 76.6 | [69.1, 82.7] |
| RIZIV code for complex surgery | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,139 | 78.2 | [76.3, 80.0] |
| Pancreaticoduodenectomy | 1,975 | 78.9 | [76.9, 80.8] |
| Total Pancreatectomy | 164 | 70.0 | [62.0, 76.7] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 183 | 85.4 | [79.0, 90.2] |
| 242874-242885: Hemipancreatectomy left | 382 | 84.7 | [80.3, 88.2] |
| 242896-242900: Enucleation of a pancreatic tumour | 2 | NA [⋆] | - |
| Antithrombotic medication | | | |
| No | 1,865 | 81.4 | [79.5, 83.2] |
| Yes | 841 | 75.4 | [72.1, 78.4] |
| Was the patient referred? | | | |
| No | 1,105 | 81.4 | [78.8, 83.8] |
| Yes | 1,601 | 78.3 | [76.1, 80.4] |

* Tumour staging not possible.

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

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

⋆ N<50

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

| Characteristic | 3-year relative survival after surgery, % | | |
|--|---|------------------|---------------------|
| | N | Belgium | |
| | | % | 95% CI |
| Operated patients with adenocarcinoma | 2,706 | 48.3 | [45.9, 50.7] |
| Convention year | | | |
| Year 1 | 476 | 48.9 | [44.1, 53.7] |
| Year 2 | 554 | 48.8 | [44.3, 53.2] |
| Year 3 | 552 | 44.7 | [40.1, 49.3] |
| Year 4 | 545 | NA ^{KK} | NA ^{KK} |
| Year 5 | 579 | NA ^{KK} | NA ^{KK} |
| Sex | | | |
| Male | 1,465 | 47.3 | [44.0, 50.6] |
| Female | 1,241 | 49.5 | [45.9, 53.0] |
| Age at surgery | | | |
| <=69 | 1,412 | 50.9 | [47.6, 54.1] |
| 70-79 | 997 | 47.1 | [42.9, 51.1] |
| >=80 | 297 | 39.9 | [32.0, 48.0] |
| Lesion to treat (in (peri-)pancreas) | | | |
| Primary tumour | 2,647 | 47.8 | [45.3, 50.2] |
| Relapse of primary tumour | 26 | NA ^K | - |
| Metastasis | 33 | NA ^K | - |
| Primary tumour localisation | | | |
| C17.0 Duodenum | 138 | 70.6 | [59.7, 79.6] |
| C24.0 Extrahepatic bile duct | 206 | 47.5 | [38.9, 55.8] |
| C24.1 (Peri-) ampullary region | 321 | 67.0 | [59.8, 73.4] |
| C25.0 Head of pancreas | 1,343 | 39.9 | [36.5, 43.2] |
| C25.1 Body of pancreas | 239 | 51.6 | [42.6, 60.1] |
| C25.2 Tail of pancreas | 271 | 46.8 | [38.9, 54.5] |
| C25.3 Pancreatic duct | 13 | NA ^K | - |
| C25.7-9 Other specified parts of pancreas | 104 | 46.6 | [34.8, 57.8] |
| Other | 71 | 77.3 | [63.2, 87.2] |
| Clinical stage | | | |
| 0 | 33 | NA ^K | - |
| I | 1,374 | 51.6 | [48.1, 55.0] |
| II | 746 | 40.9 | [36.4, 45.4] |
| III | 313 | 43.1 | [35.8, 50.3] |
| IV | 64 | 47.5 | [31.7, 62.0] |
| X | 149 | 59.4 | [49.4, 68.3] |
| TNM not applicable or relapse* | 27 | NA ^K | - |
| Pathological stage | | | |
| 0 | 43 | NA ^K | - |

| Characteristic | 3-year relative survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| I | 459 | 72.6 | [66.9, 77.8] |
| II | 764 | 48.0 | [43.4, 52.6] |
| III | 723 | 36.9 | [32.4, 41.4] |
| IV | 60 | 28.7 | [16.2, 42.8] |
| X | 23 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 19 | NA [Ⓚ] | - |
| Neoadjuvant treatment [†] | 615 | 41.6 | [36.4, 46.8] |
| <i>y</i>Pathological stage | | | |
| 0 | 19 | NA [Ⓚ] | - |
| I | 213 | 56.9 | [47.4, 65.5] |
| II | 202 | 32.5 | [24.3, 41.0] |
| III | 137 | 31.8 | [21.6, 42.6] |
| IV | 33 | NA [Ⓚ] | - |
| X | 3 | NA [Ⓚ] | - |
| TNM not applicable or relapse* | 8 | NA [Ⓚ] | - |
| No neoadjuvant treatment | 2,091 | 50.1 | [47.4, 52.8] |
| Resection margin | | | |
| R0 | 1,850 | 54.9 | [51.9, 57.8] |
| R1 | 846 | 34.2 | [30.1, 38.3] |
| R2 | 10 | NA [Ⓚ] | - |
| Prior surgery or other treatment ** | | | |
| Prior abdominal surgery | 407 | 48.3 | [42.1, 54.3] |
| Other treatment modality (that could affect the pancreas) | 476 | 46.4 | [40.4, 52.2] |
| Neoadjuvant treatment | | | |
| Chemoradiotherapy | 85 | 59.3 | [45.2, 71.2] |
| Chemotherapy | 528 | 39.5 | [33.9, 45.0] |
| Radiotherapy | 2 | NA [Ⓚ] | - |
| No chemo or radiation treatment | 2,091 | 50.1 | [47.4, 52.8] |
| Charlson Comorbidity Index | | | |
| 0 | 1,067 | 55.8 | [51.9, 59.6] |
| 1 | 679 | 44.1 | [39.2, 48.9] |
| 2 | 436 | 44.4 | [38.3, 50.3] |
| 3 | 231 | 42.4 | [34.2, 50.5] |
| 4 | 140 | 39.3 | [28.7, 50.1] |
| 5 | 64 | 42.7 | [27.3, 57.9] |
| 6 | 36 | NA [Ⓚ] | - |
| 7 | 28 | NA [Ⓚ] | - |
| 8 | 14 | NA [Ⓚ] | - |
| 9 | 8 | NA [Ⓚ] | - |
| 10 | 3 | NA [Ⓚ] | - |
| WHO score at surgery | | | |
| 0 - Asymptomatic, normal activity | 625 | 52.6 | [47.4, 57.5] |

| Characteristic | 3-year relative survival after surgery, % | | |
|--|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| 1 - Symptomatic, but ambulant | 1,736 | 49.7 | [46.6, 52.7] |
| 2 - Symptomatic, bedbound < 50% day | 288 | 35.4 | [28.4, 42.6] |
| 3 - Symptomatic, bedbound > 50% day | 55 | 30.6 | [16.6, 46.2] |
| 4 - Completely dependent, 100% bedbound | 2 | NA [✱] | - |
| ASA score | | | |
| 1 - Healthy person | 140 | 56.5 | [46.6, 65.4] |
| 2 - Mild systemic disease, normal activity | 1,377 | 52.5 | [49.1, 55.8] |
| 3 - Serious systemic disease, limited activity | 1,152 | 42.4 | [38.6, 46.2] |
| 4 - Life-threatening illness, handicapped | 37 | NA [✱] | - |
| Resectability status ^{**} | | | |
| Before neoadjuvant treatment | | | |
| Upfront resectable | 110 | 41.7 | [27.4, 55.6] |
| Borderline resectable | 305 | 43.2 | [34.8, 51.5] |
| Unresectable | 74 | 38.5 | [23.1, 54.0] |
| No neoadjuvant treatment | 1,502 | 50.3 | [46.7, 53.8] |
| Before surgery | | | |
| Upfront resectable | 1,645 | 50.3 | [46.8, 53.7] |
| Borderline resectable | 319 | 40.9 | [33.1, 48.6] |
| Unresectable | 21 | NA [✱] | - |
| Missing | 6 | NA [✱] | - |
| Type of surgery | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 595 | 53.3 | [48.1, 58.3] |
| Minimally invasive surgery (MIS) - Hybrid | 2 | NA [✱] | - |
| Minimally invasive surgery (MIS) - Robotic | 241 | 46.7 | [36.8, 56.1] |
| Open | 1,739 | 48.1 | [45.1, 51.1] |
| Conversion from MIS to open surgery | 129 | 30.9 | [21.4, 41.1] |
| Simultaneous venous resection | | | |
| No | 2,242 | 52.1 | [49.4, 54.7] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 464 | 30.1 | [24.8, 35.7] |
| - With primary wedge-reconstruction | 152 | 24.5 | [15.5, 34.7] |
| - With primary end-to-end reconstruction | 193 | 34.6 | [26.6, 42.8] |
| - With vascular autograft interposition | 10 | NA [✱] | - |
| - With vascular allograft interposition | 54 | 21.7 | [8.3, 39.3] |
| - With synthetic/prosthetic interposition | 7 | NA [✱] | - |
| - With peritoneal patch wedge-reconstruction | 39 | NA [✱] | - |
| - Without reconstruction | 9 | NA [✱] | - |
| Simultaneous arterial resection ^{**} | | | |
| No | 2,639 | 48.7 | [46.2, 51.2] |
| Hepatic artery resection | 27 | NA [✱] | - |
| - With primary end-to-end reconstruction | 16 | NA [✱] | - |
| - With vascular allograft interposition | 1 | NA [✱] | - |

| Characteristic | 3-year relative survival after surgery, % | | |
|---|---|-----------------|--------------|
| | N | Belgium | |
| | | % | 95% CI |
| - Without reconstruction | 10 | NA [✱] | - |
| Coeliac trunk resection | 32 | NA [✱] | - |
| - With primary end-to-end reconstruction | 2 | NA [✱] | - |
| - Without reconstruction | 30 | NA [✱] | - |
| Superior mesenteric artery (SMA) resection | 7 | NA [✱] | - |
| - With primary wedge-reconstruction | 1 | NA [✱] | - |
| - With primary end-to-end reconstruction | 3 | NA [✱] | - |
| - With vascular autograft interposition | 2 | NA [✱] | - |
| - Without reconstruction | 1 | NA [✱] | - |
| Simultaneous other organ resection ** | | | |
| No | 1,648 | 48.7 | [45.6, 51.7] |
| Colon | 84 | 39.7 | [25.8, 53.7] |
| Stomach | 477 | 45.2 | [39.3, 51.0] |
| Adrenal gland | 71 | 37.6 | [23.0, 52.5] |
| Spleen | 506 | 47.9 | [41.9, 53.6] |
| Other | 166 | 50.6 | [41.1, 59.6] |
| RIZIV code for complex surgery | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,139 | 47.9 | [45.2, 50.6] |
| Pancreaticoduodenectomy | 1,975 | 48.0 | [45.2, 50.8] |
| Total Pancreatectomy | 164 | 47.0 | [36.7, 56.9] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 183 | 49.4 | [39.8, 58.4] |
| 242874-242885: Hemipancreatectomy left | 382 | 50.4 | [43.4, 57.0] |
| 242896-242900: Enucleation of a pancreatic tumour | 2 | NA [✱] | - |
| Antithrombotic medication | | | |
| No | 1,865 | 50.6 | [47.7, 53.5] |
| Yes | 841 | 43.2 | [38.8, 47.5] |
| Was the patient referred? | | | |
| No | 1,105 | 49.2 | [45.4, 53.0] |
| Yes | 1,601 | 47.7 | [44.5, 50.8] |

* Tumour staging not possible.

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

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

✱ N<50

✱✱ 3-year follow-up after surgery is not reached.

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

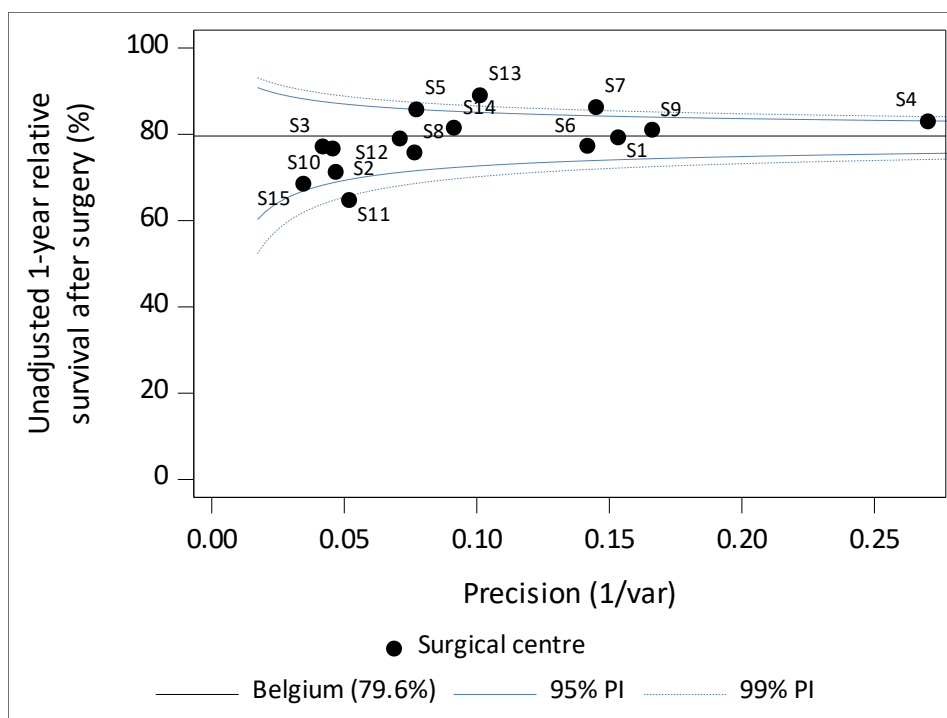
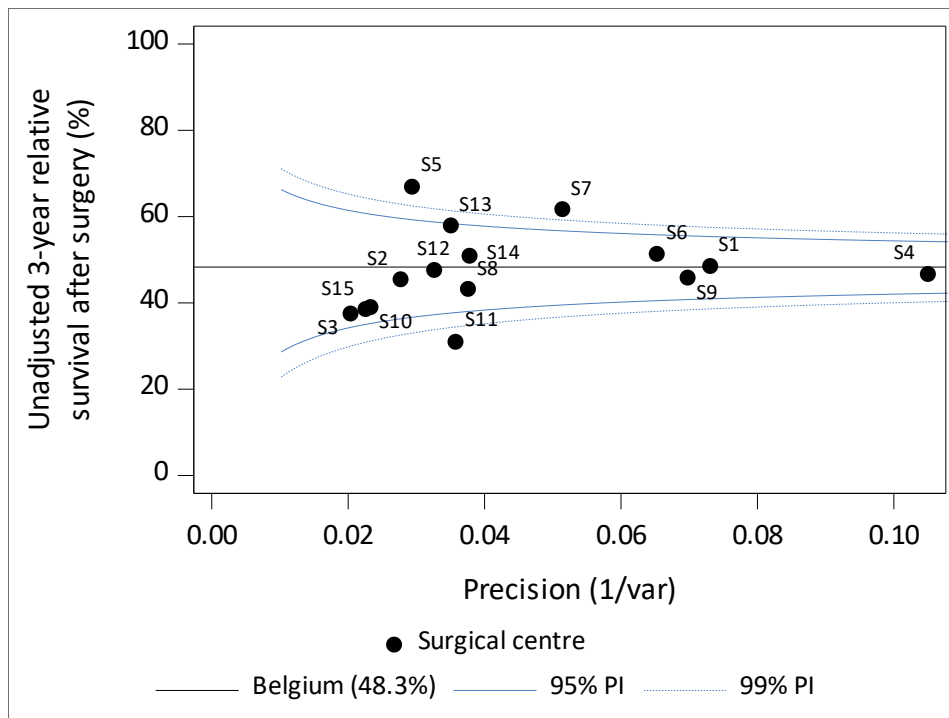


Figure 21: Unadjusted 3-year relative survival after surgery for **adenocarcinoma** for all years combined.



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

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

| Resection margin | Belgium | | | |
|--|--------------|-------|---------|--------------|
| | N | n | n/N (%) | 95% CI |
| Operated patients with pancreatic ductal adenocarcinoma | 1,759 | | | |
| Convention year | | | | |
| Year 1 | 288 | | | |
| Year 2 | 364 | | | |
| Year 3 | 349 | | | |
| Year 4 | 351 | | | |
| Year 5 | 407 | | | |
| Resection margin status | | | | |
| R0 | 1,759 | 1,076 | 61.2 | [58.8, 63.5] |
| - With simultaneous vascular resection | | 207 | | |
| - Without simultaneous vascular resection | | 869 | | |
| R1 indirect | 1,759 | 447 | 25.4 | [23.4, 27.5] |
| - With simultaneous vascular resection | | 128 | | |
| - Without simultaneous vascular resection | | 319 | | |
| R1 direct | 1,759 | 228 | 13.0 | [11.4, 14.6] |
| - With simultaneous vascular resection | | 81 | | |
| - Without simultaneous vascular resection | | 147 | | |
| R2 | 1,759 | 8 | 0.5 | [0.2, 0.9] |
| - With simultaneous vascular resection | | 3 | | |
| - Without simultaneous vascular resection | | 5 | | |

R0: tumour-free resection margin > 1mm

R1 indirect: tumour-free resection margin ≤ 1mm

R1 direct: microscopic tumour involvement of the resection margin

R2: macroscopic tumour transection

Remark: Enucleation is regarded as a R1 resection

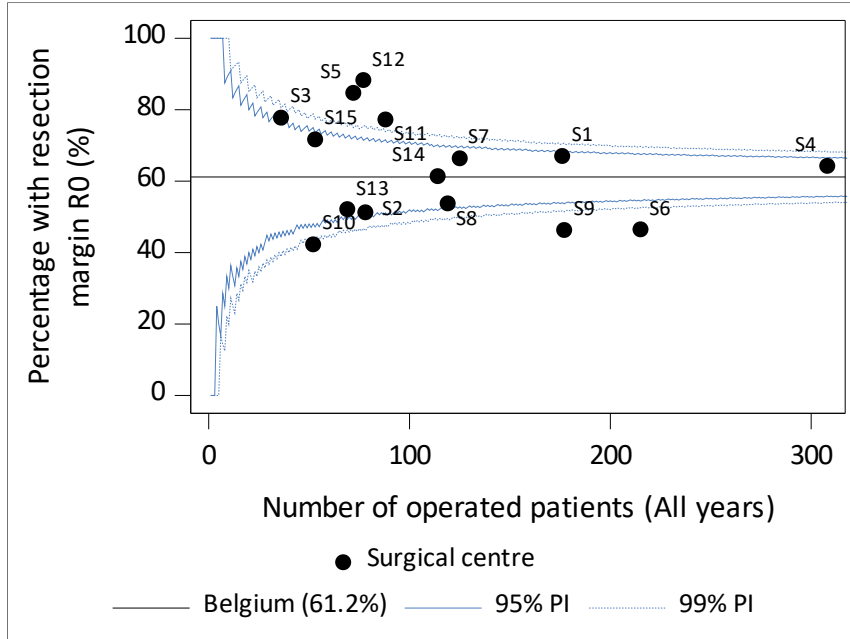
Remark: Reduced absolute number of patients is due to the specific selection of 'pancreatic ductal adenocarcinoma' (i.e.

ICD-O-3 selection applied: topography C25, morphology 8500/3)

Remark: Patients with R1 without specification direct or indirect were excluded from the table (N=8)

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

(a)



(b)

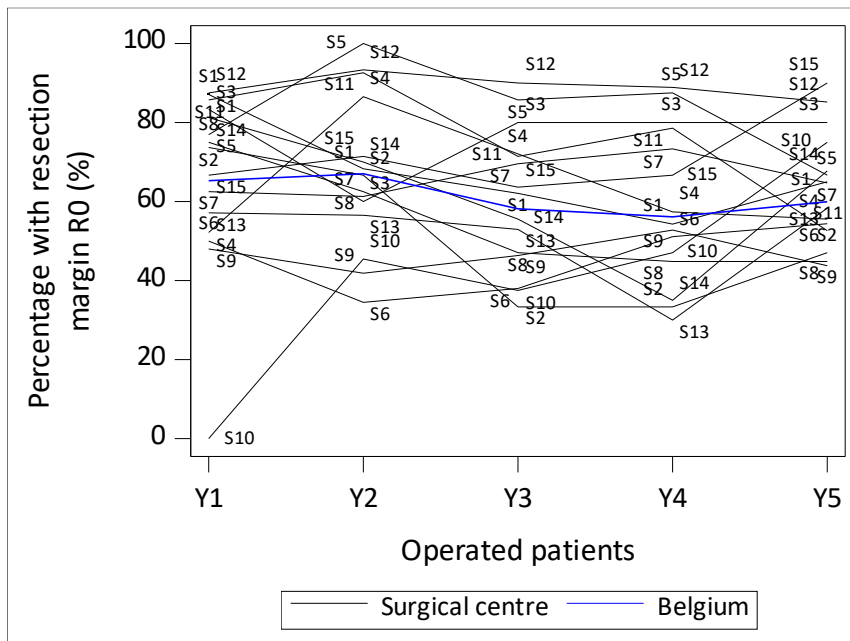
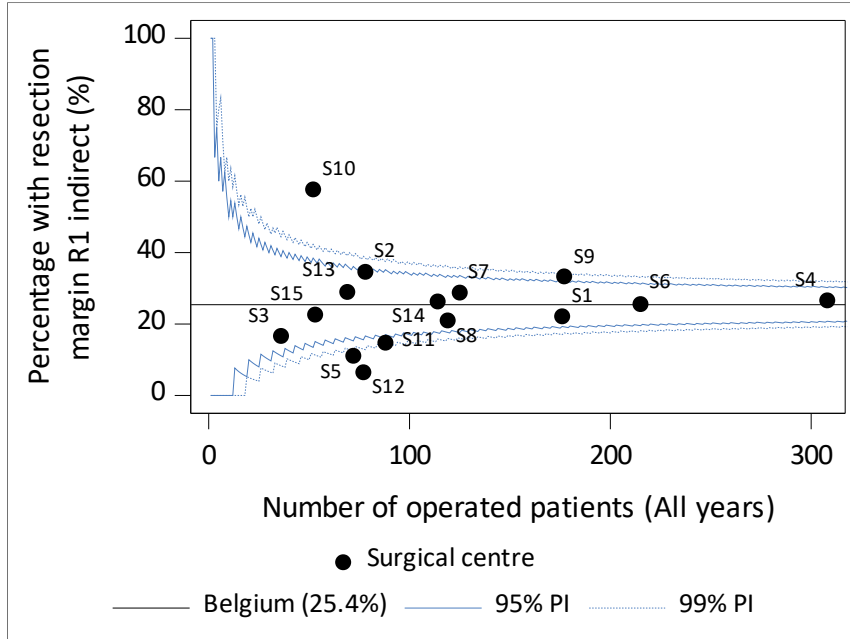


Figure 23: Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 indirect**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

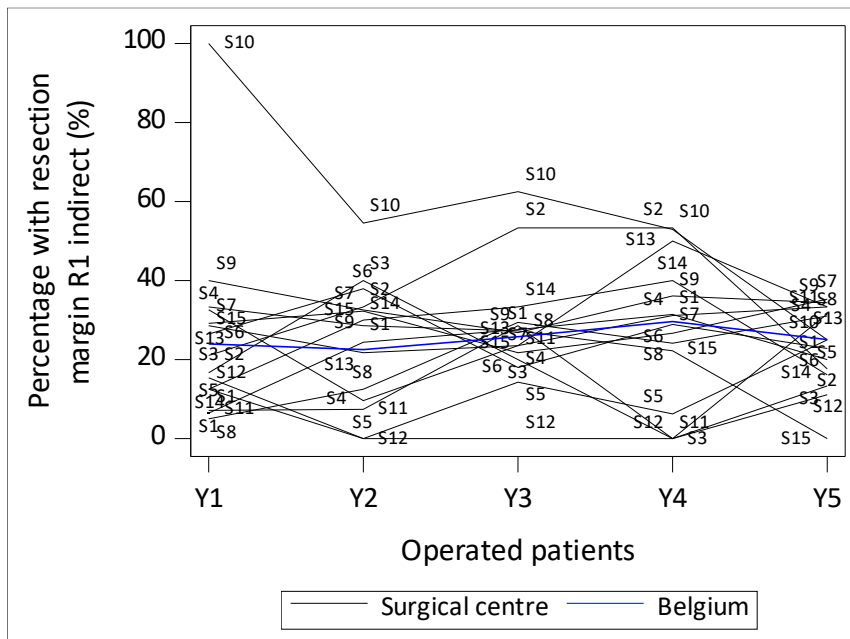
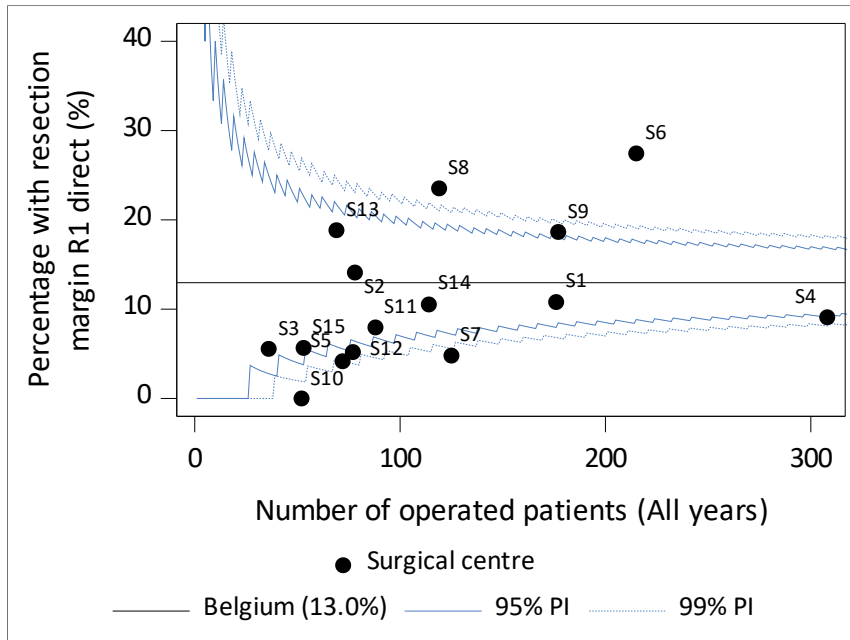


Figure 24: Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R1 direct**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

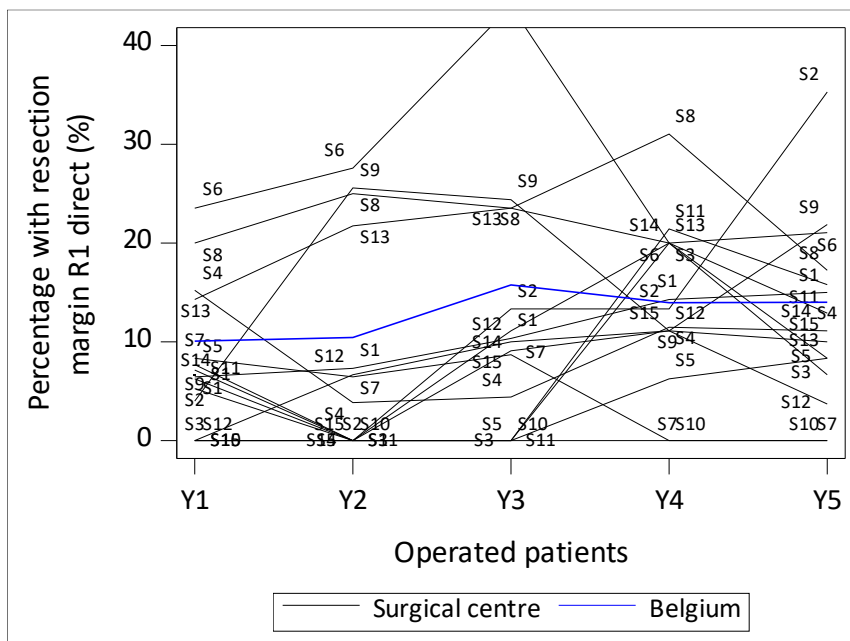
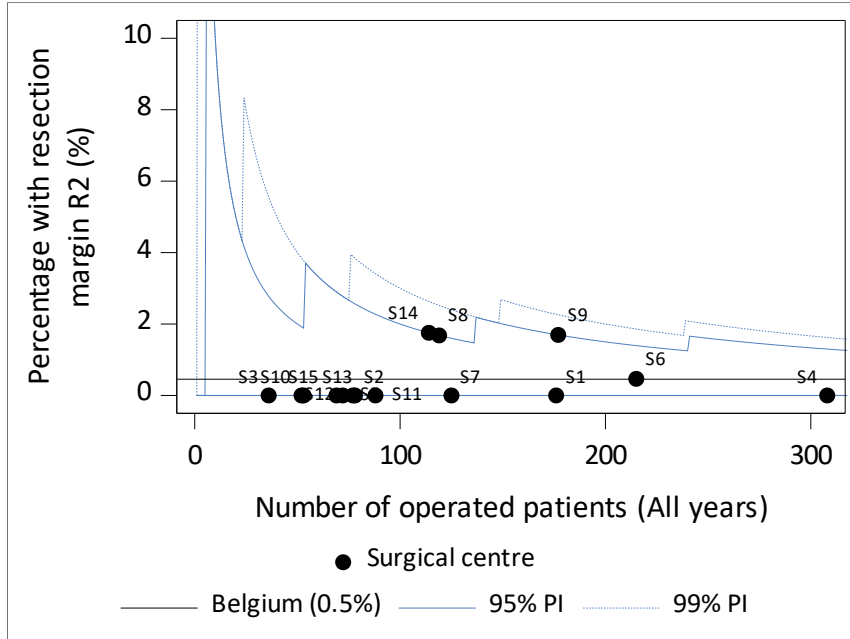
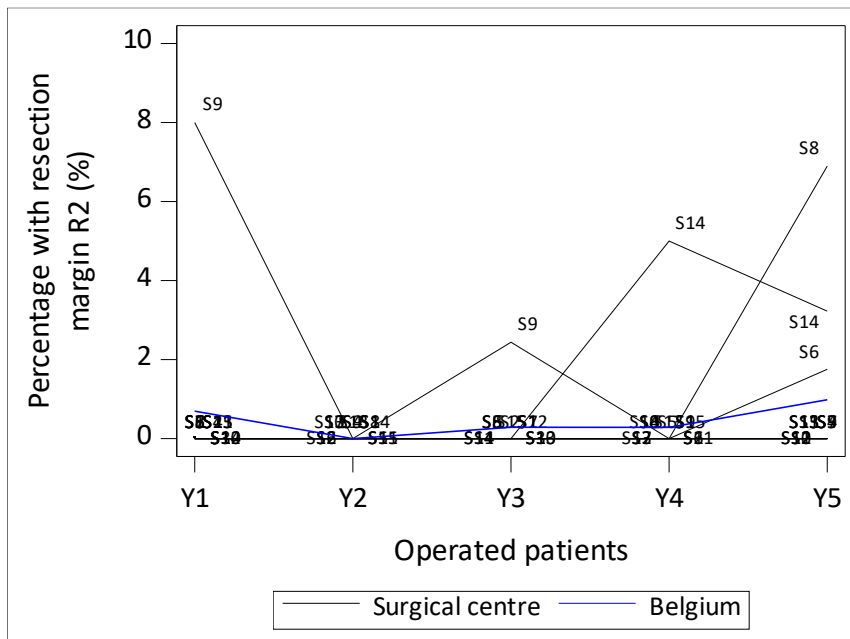


Figure 25: Funnel and spaghetti plot of the proportion of operated patients with **pancreatic ductal adenocarcinoma** with resection margin **R2**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

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

| Complication type | Postoperative complications (90-day in-hospital) | | | |
|---|--|-----|---------|--------------|
| | N | n | Belgium | |
| | | | n/N (%) | 95% CI |
| <i>Severe postoperative complications (CD IIIb-V)</i> | 4,176 | 609 | 14.6 | [13.5, 15.7] |
| Year 1 | 724 | 98 | 13.5 | [11.1, 16.2] |
| Year 2 | 856 | 114 | 13.3 | [11.1, 15.8] |
| Year 3 | 851 | 125 | 14.7 | [12.4, 17.2] |
| Year 4 | 834 | 112 | 13.4 | [11.2, 15.9] |
| Year 5 | 911 | 160 | 17.6 | [15.1, 20.2] |
| <i>Clinically relevant pancreatic fistula (Grade B or C) ^{1*}</i> | 4,176 | 828 | 19.8 | [18.6, 21.1] |
| Grade B | 4,176 | 751 | 18.0 | [16.8, 19.2] |
| Year 1 | 724 | 120 | 16.6 | [13.9, 19.5] |
| Year 2 | 856 | 151 | 17.6 | [15.1, 20.4] |
| Year 3 | 851 | 142 | 16.7 | [14.2, 19.4] |
| Year 4 | 834 | 144 | 17.3 | [14.8, 20.0] |
| Year 5 | 911 | 194 | 21.3 | [18.7, 24.1] |
| Grade C | 4,176 | 77 | 1.8 | [1.5, 2.3] |
| Year 1 | 724 | 15 | 2.1 | [1.2, 3.4] |
| Year 2 | 856 | 15 | 1.8 | [1.0, 2.9] |
| Year 3 | 851 | 26 | 3.1 | [2.0, 4.4] |
| Year 4 | 834 | 10 | 1.2 | [0.6, 2.2] |
| Year 5 | 911 | 11 | 1.2 | [0.6, 2.2] |
| <i>Haemorrhage (Grade A, B or C) ^{2*}</i> | 4,176 | 362 | 8.7 | [7.8, 9.6] |
| Grade A | 4,176 | 84 | 2.0 | [1.6, 2.5] |
| Year 1 | 724 | 14 | 1.9 | [1.1, 3.2] |
| Year 2 | 856 | 17 | 2.0 | [1.2, 3.2] |
| Year 3 | 851 | 15 | 1.8 | [1.0, 2.9] |
| Year 4 | 834 | 12 | 1.4 | [0.7, 2.5] |
| Year 5 | 911 | 26 | 2.9 | [1.9, 4.2] |
| Grade B | 4,176 | 163 | 3.9 | [3.3, 4.5] |
| Year 1 | 724 | 22 | 3.0 | [1.9, 4.6] |
| Year 2 | 856 | 45 | 5.3 | [3.9, 7.0] |
| Year 3 | 851 | 28 | 3.3 | [2.2, 4.7] |
| Year 4 | 834 | 26 | 3.1 | [2.0, 4.5] |
| Year 5 | 911 | 42 | 4.6 | [3.3, 6.2] |

| Postoperative complications (90-day in-hospital) | | | | |
|--|-------|-----|---------|--------------|
| Belgium | | | | |
| Complication type | N | n | n/N (%) | 95% CI |
| Grade C | 4,176 | 115 | 2.8 | [2.3, 3.3] |
| Year 1 | 724 | 26 | 3.6 | [2.4, 5.2] |
| Year 2 | 856 | 24 | 2.8 | [1.8, 4.1] |
| Year 3 | 851 | 23 | 2.7 | [1.7, 4.0] |
| Year 4 | 834 | 19 | 2.3 | [1.4, 3.5] |
| Year 5 | 911 | 23 | 2.5 | [1.6, 3.8] |
| <i>Delayed gastric emptying (Grade A, B or C) ^{3*}</i> | 4,176 | 704 | 16.9 | [15.7, 18.0] |
| Grade A | 4,176 | 338 | 8.1 | [7.3, 9.0] |
| Year 1 | 724 | 50 | 6.9 | [5.2, 9.0] |
| Year 2 | 856 | 76 | 8.9 | [7.1, 11.0] |
| Year 3 | 851 | 67 | 7.9 | [6.2, 9.9] |
| Year 4 | 834 | 63 | 7.6 | [5.9, 9.6] |
| Year 5 | 911 | 82 | 9.0 | [7.2, 11.0] |
| Grade B | 4,176 | 253 | 6.1 | [5.4, 6.8] |
| Year 1 | 724 | 43 | 5.9 | [4.3, 7.9] |
| Year 2 | 856 | 42 | 4.9 | [3.6, 6.6] |
| Year 3 | 851 | 52 | 6.1 | [4.6, 7.9] |
| Year 4 | 834 | 46 | 5.5 | [4.1, 7.3] |
| Year 5 | 911 | 70 | 7.7 | [6.0, 9.6] |
| Grade C | 4,176 | 113 | 2.7 | [2.2, 3.2] |
| Year 1 | 724 | 16 | 2.2 | [1.3, 3.6] |
| Year 2 | 856 | 18 | 2.1 | [1.3, 3.3] |
| Year 3 | 851 | 25 | 2.9 | [1.9, 4.3] |
| Year 4 | 834 | 23 | 2.8 | [1.8, 4.1] |
| Year 5 | 911 | 31 | 3.4 | [2.3, 4.8] |
| <i>Bile leakage (Grade A, B or C) ^{4*}</i> | 4,176 | 140 | 3.4 | [2.8, 3.9] |
| Grade A | 4,176 | 43 | 1.0 | [0.7, 1.4] |
| Year 1 | 724 | 8 | 1.1 | [0.5, 2.2] |
| Year 2 | 856 | 9 | 1.1 | [0.5, 2.0] |
| Year 3 | 851 | 10 | 1.2 | [0.6, 2.2] |
| Year 4 | 834 | 11 | 1.3 | [0.7, 2.3] |
| Year 5 | 911 | 5 | 0.5 | [0.2, 1.3] |
| Grade B | 4,176 | 45 | 1.1 | [0.8, 1.4] |
| Year 1 | 724 | 5 | 0.7 | [0.2, 1.6] |
| Year 2 | 856 | 9 | 1.1 | [0.5, 2.0] |
| Year 3 | 851 | 10 | 1.2 | [0.6, 2.2] |
| Year 4 | 834 | 13 | 1.6 | [0.8, 2.7] |
| Year 5 | 911 | 8 | 0.9 | [0.4, 1.7] |
| Grade C | 4,176 | 52 | 1.2 | [0.9, 1.6] |
| Year 1 | 724 | 8 | 1.1 | [0.5, 2.2] |
| Year 2 | 856 | 6 | 0.7 | [0.3, 1.5] |
| Year 3 | 851 | 10 | 1.2 | [0.6, 2.2] |

| Postoperative complications (90-day in-hospital) | | | | |
|---|-------|-----|---------|------------|
| Belgium | | | | |
| Complication type | N | n | n/N (%) | 95% CI |
| Year 4 | 834 | 11 | 1.3 | [0.7, 2.3] |
| Year 5 | 911 | 17 | 1.9 | [1.1, 3.0] |
| <i>Intra-abdominal abscess</i> * | 4,176 | 262 | 6.3 | [5.6, 7.1] |
| Year 1 | 724 | 43 | 5.9 | [4.3, 7.9] |
| Year 2 | 856 | 45 | 5.3 | [3.9, 7.0] |
| Year 3 | 851 | 54 | 6.3 | [4.8, 8.2] |
| Year 4 | 834 | 60 | 7.2 | [5.5, 9.2] |
| Year 5 | 911 | 60 | 6.6 | [5.1, 8.4] |
| <i>Transferred to another hospital due to complications (CD I-IVb)</i> | 4,176 | 3 | 0.1 | [0.0, 0.2] |
| Year 1 | 724 | 2 | 0.3 | [0.0, 1.0] |
| Year 2 | 856 | 0 | 0.0 | [0.0, 0.4] |
| Year 3 | 851 | 0 | 0.0 | [0.0, 0.4] |
| Year 4 | 834 | 1 | 0.1 | [0.0, 0.7] |
| Year 5 | 911 | 0 | 0.0 | [0.0, 0.4] |

CD: Clavien-Dindo grade

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

² graded according to the ISGPS definitions

³ graded according to the ISGPS definitions

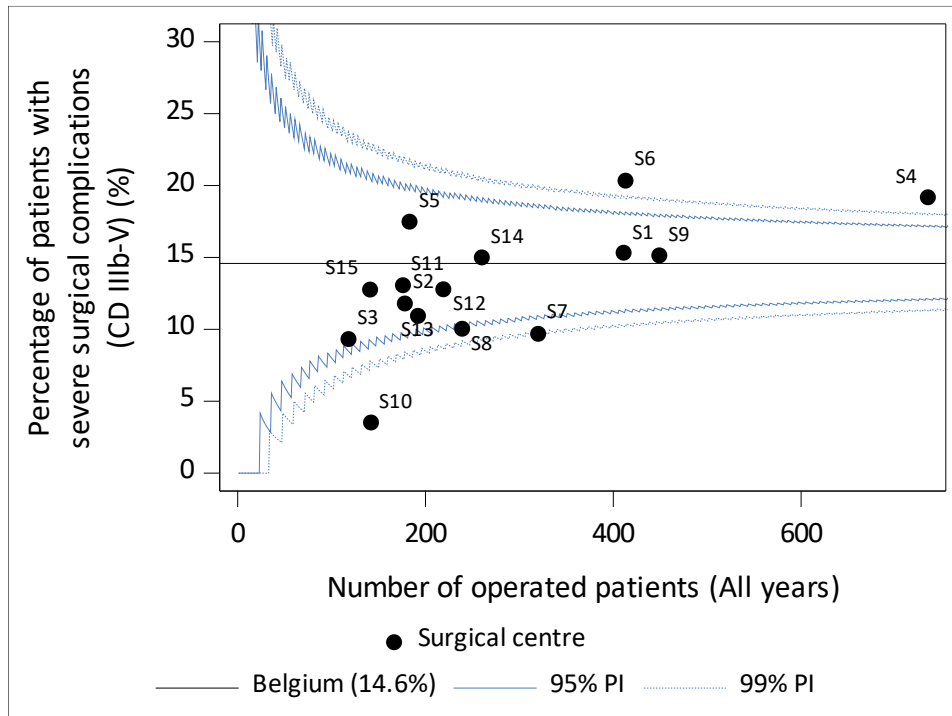
⁴ graded according to the International Study Group of Liver Surgery (ISGLS)

More information can be found in the project manual.

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

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

(a)



(b)

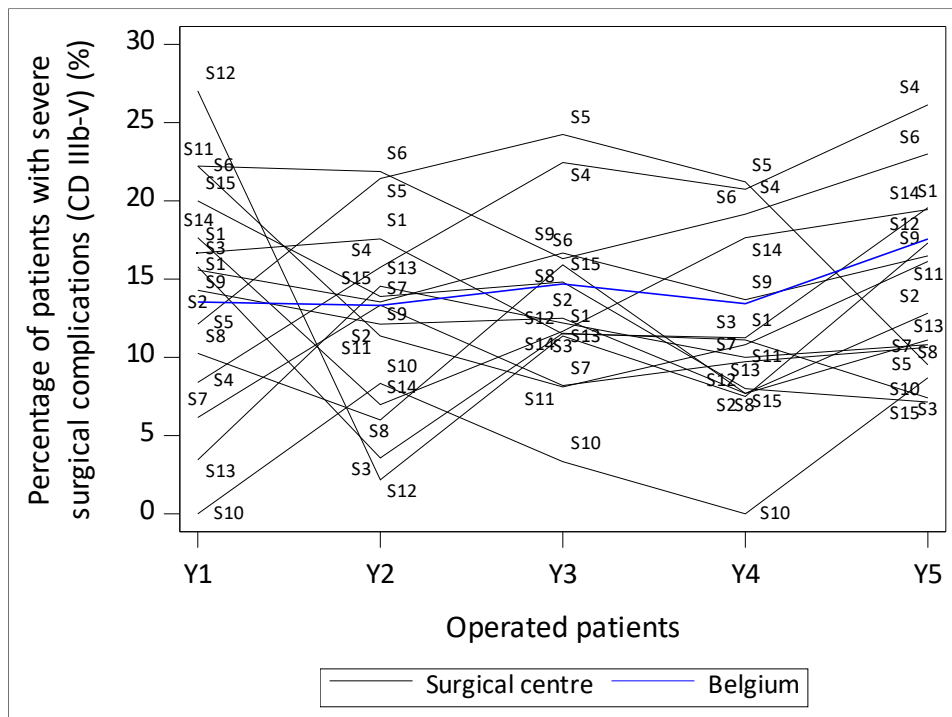
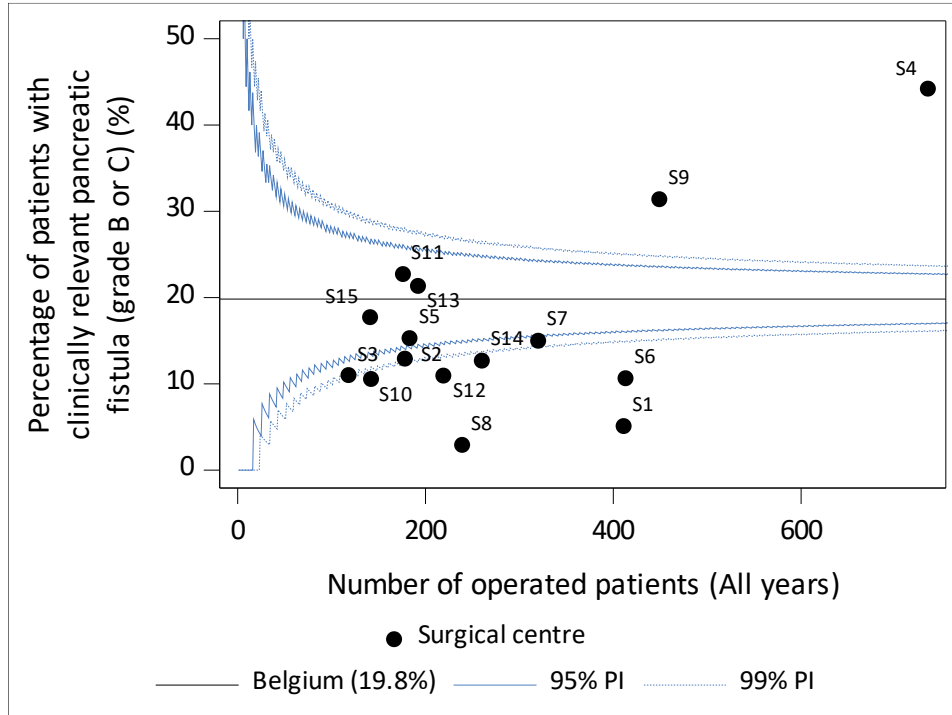


Figure 27: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

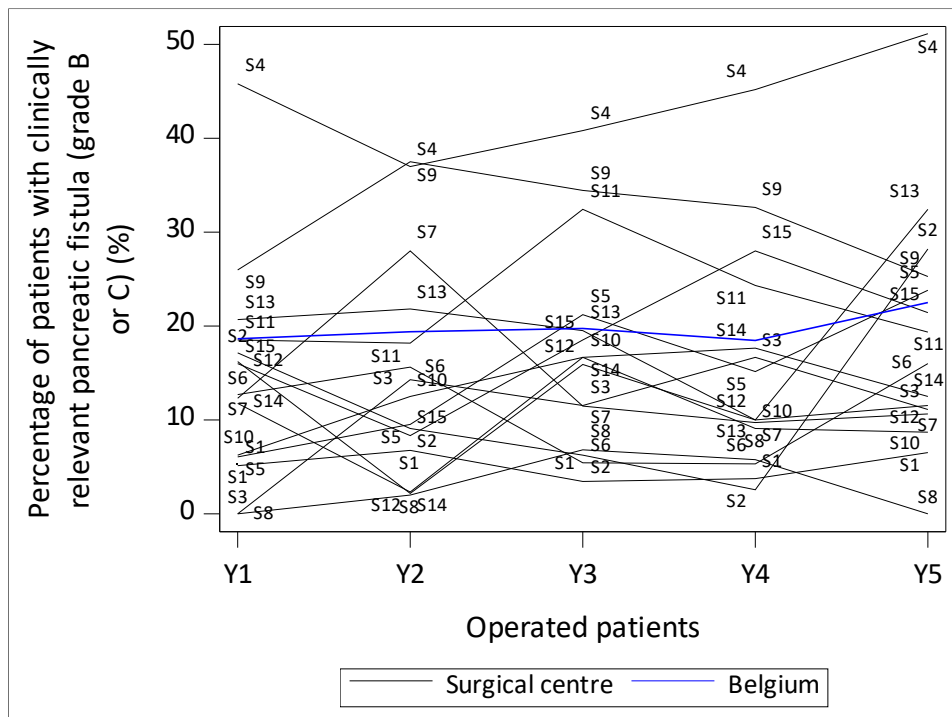
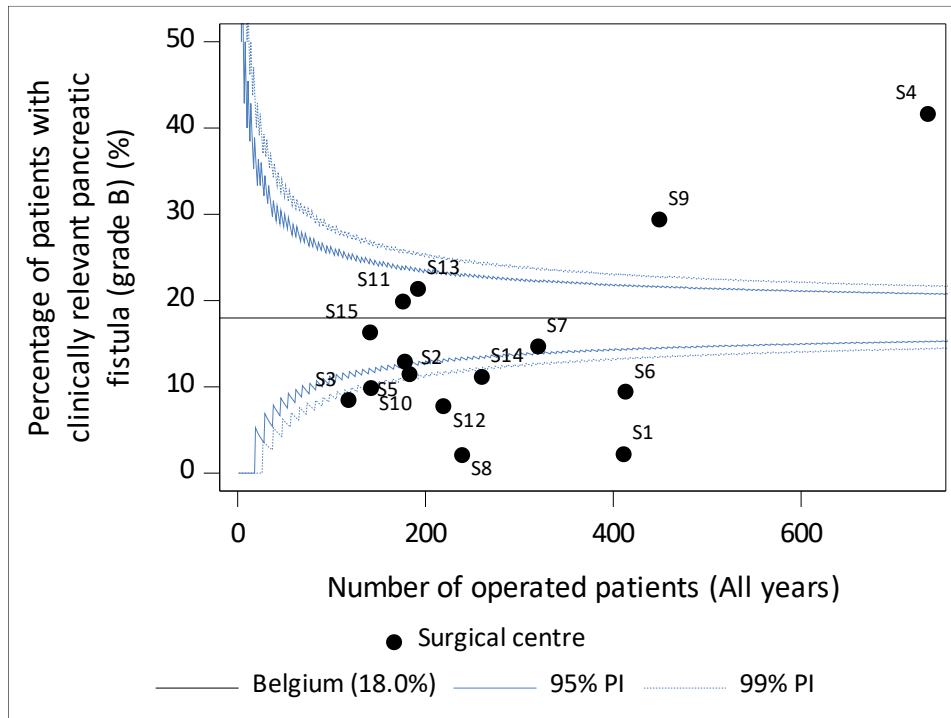


Figure 28: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

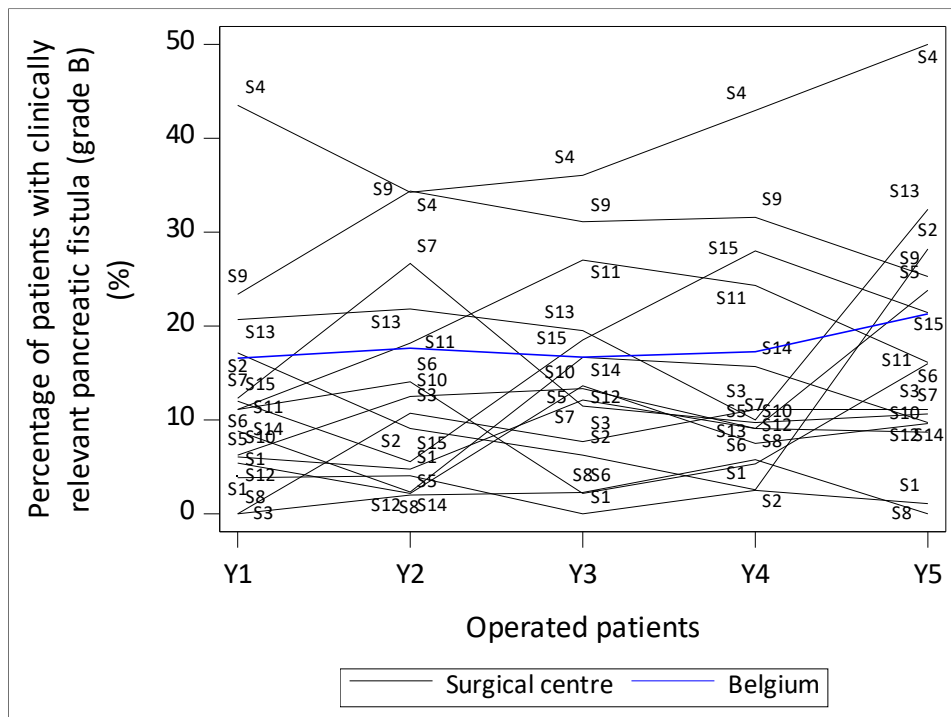
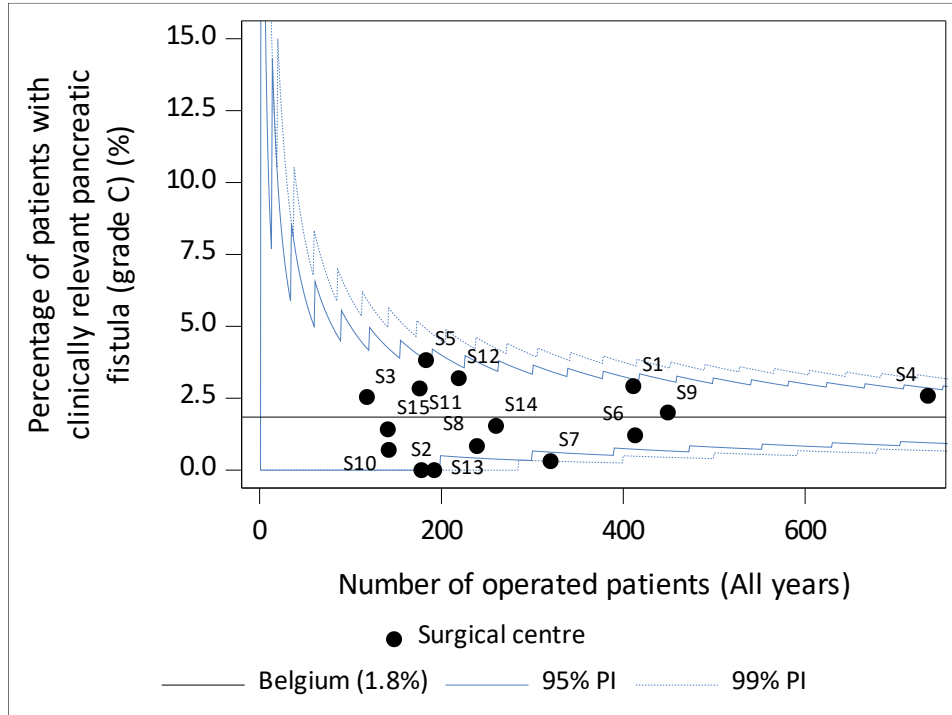


Figure 29: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

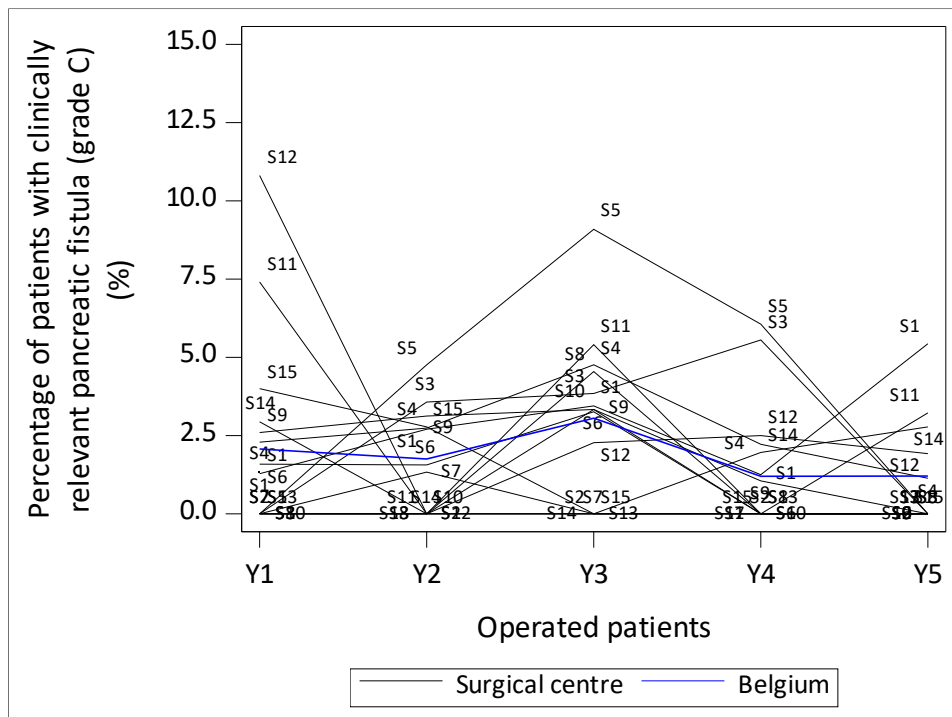
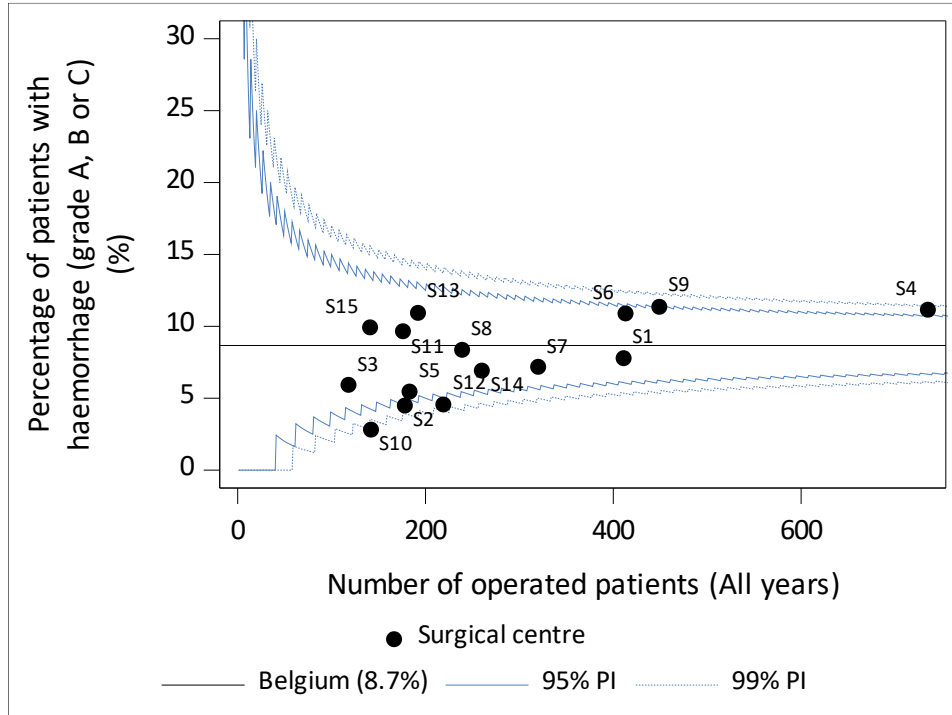


Figure 30: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

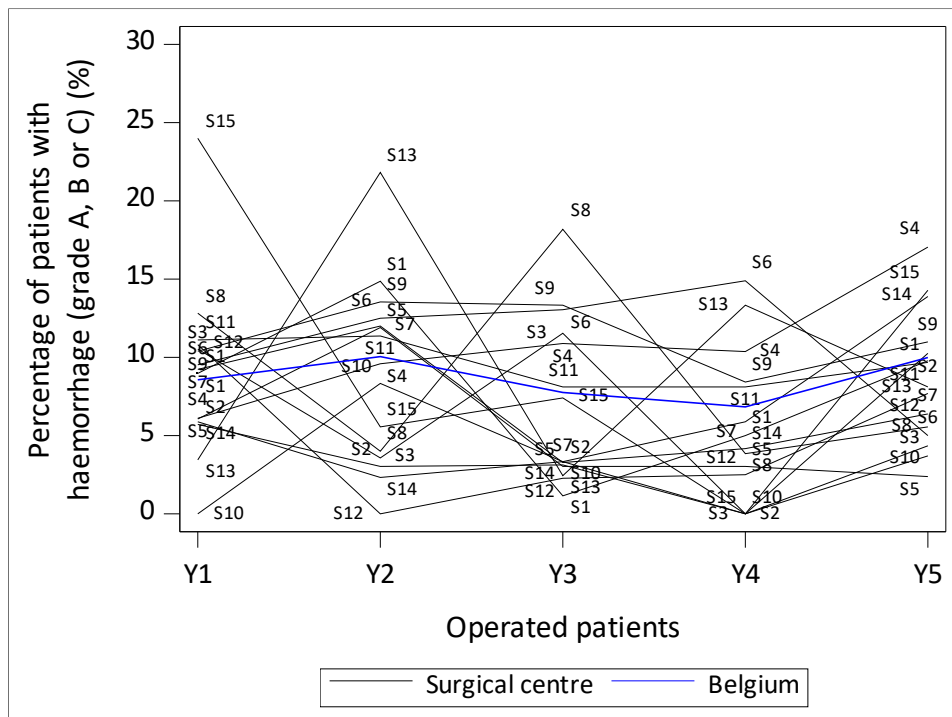
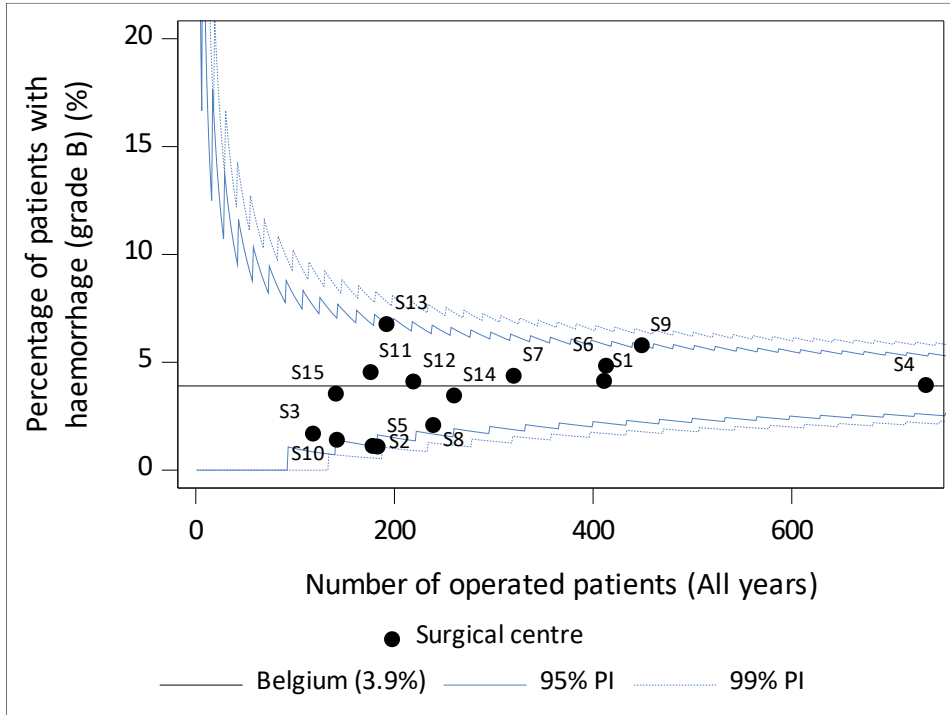


Figure 31: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with haemorrhage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

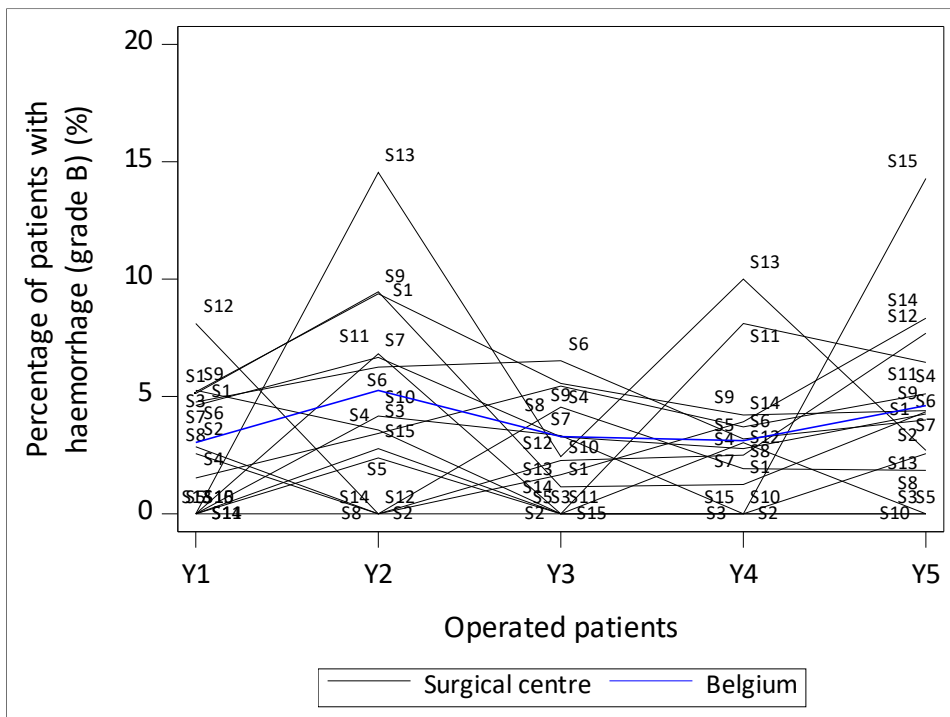
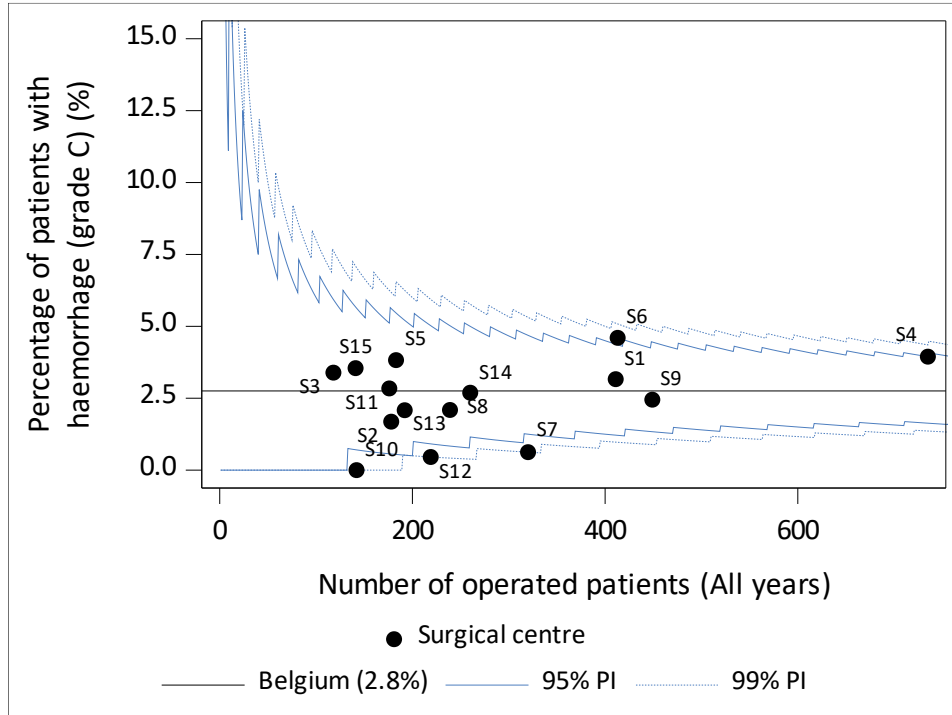


Figure 32: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with haemorrhage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

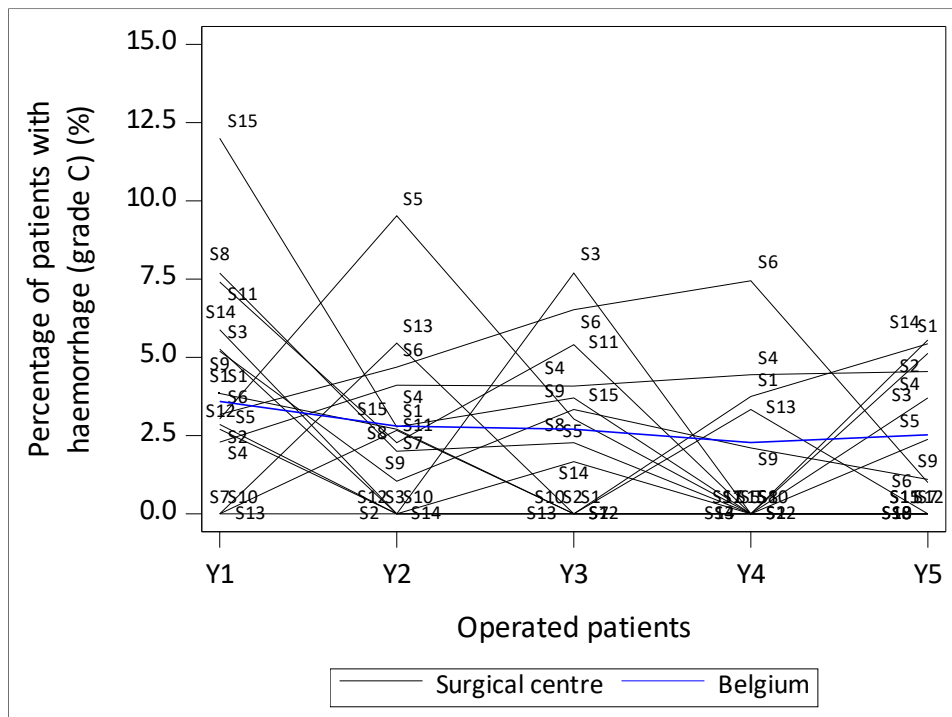
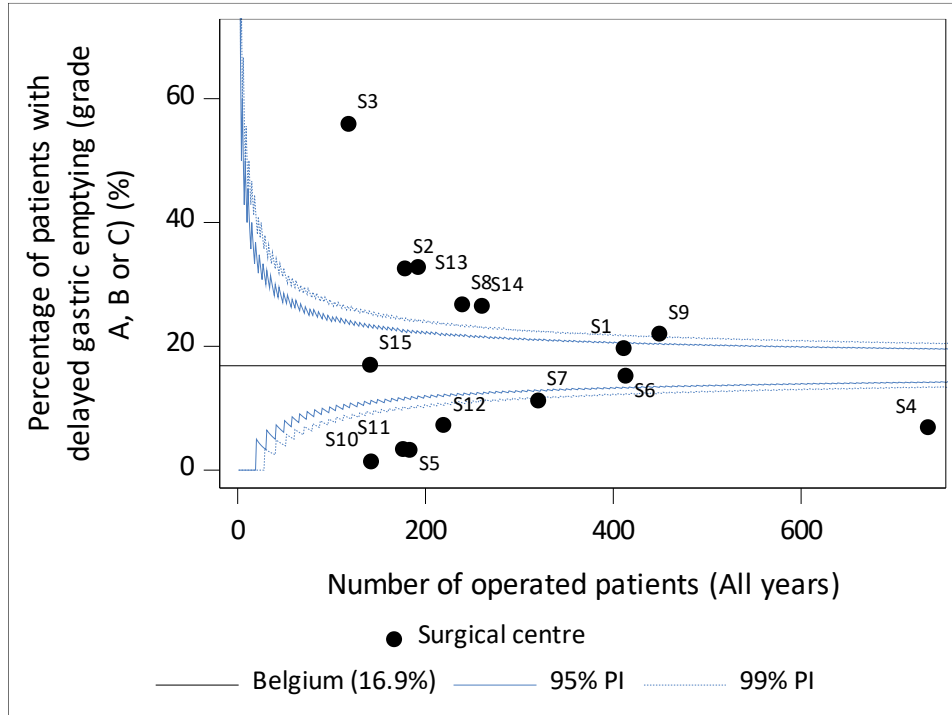


Figure 33: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

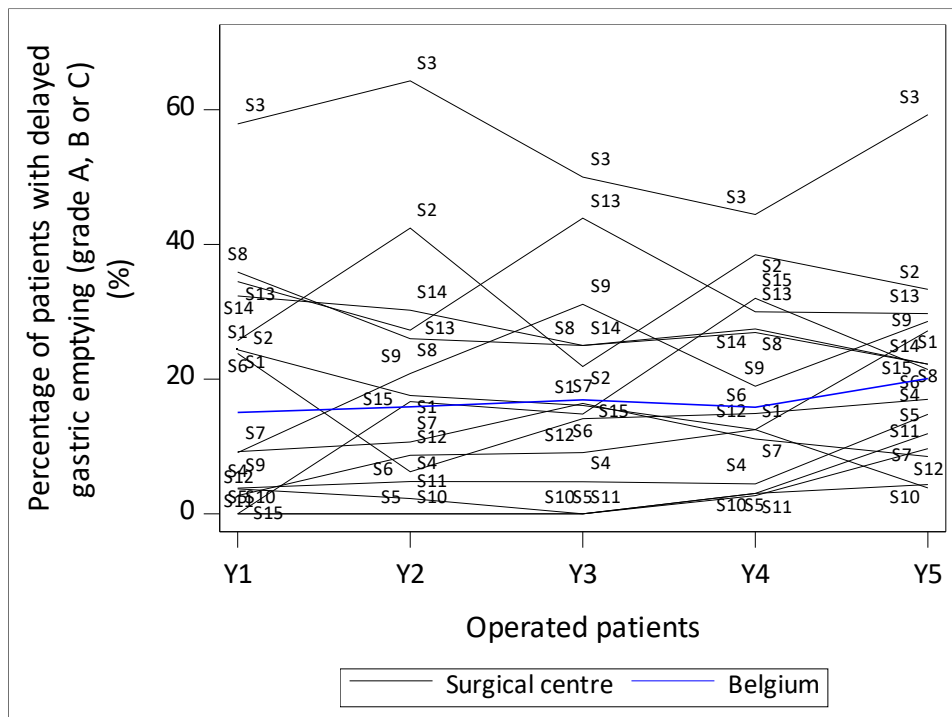
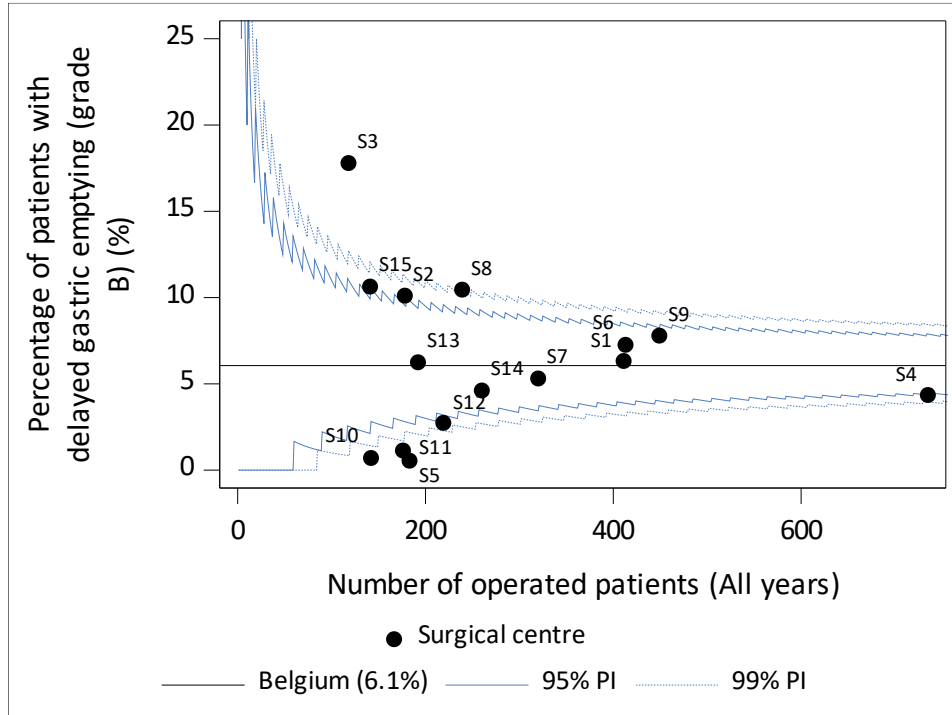


Figure 34: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with delayed gastric emptying (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

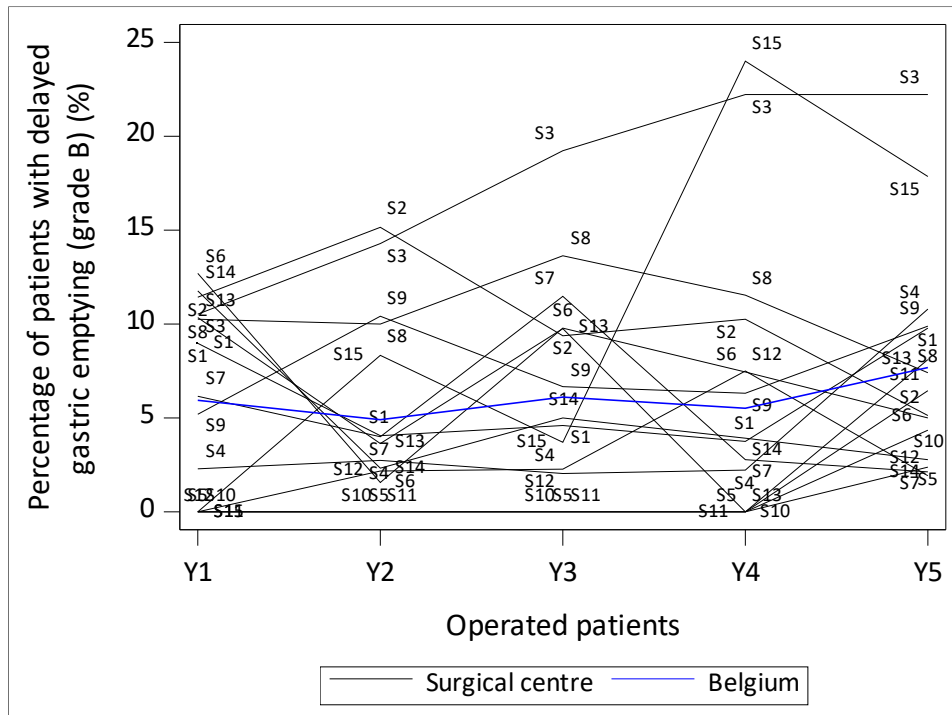
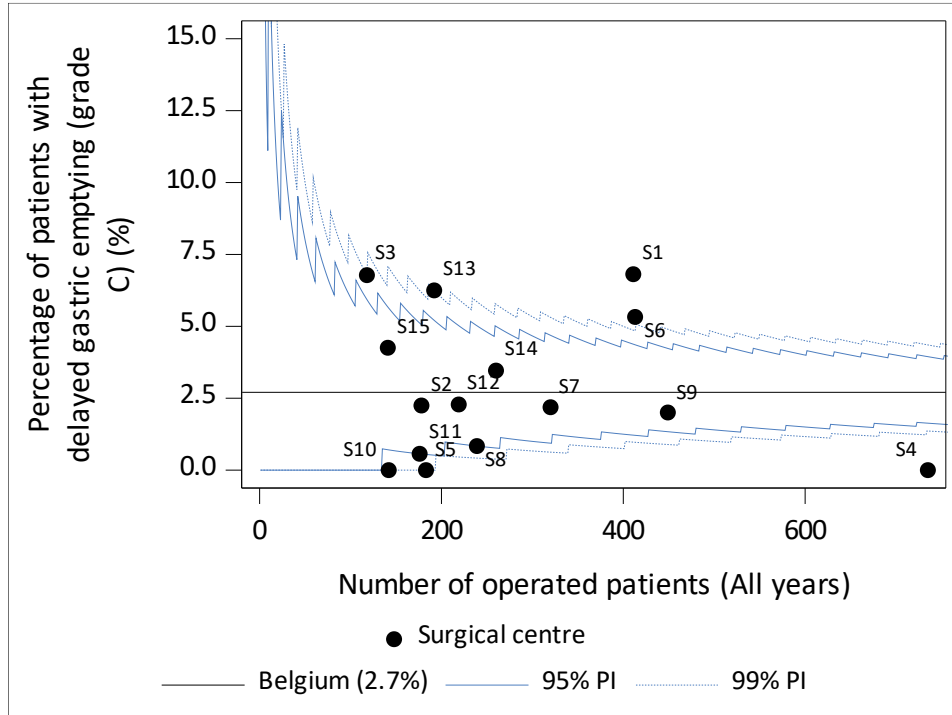


Figure 35: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

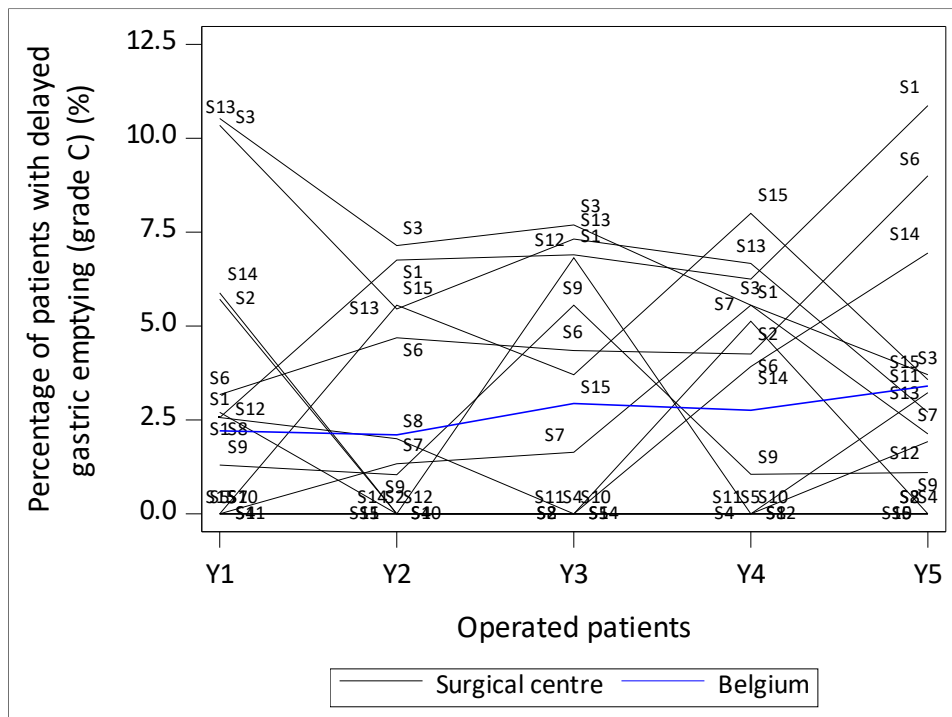
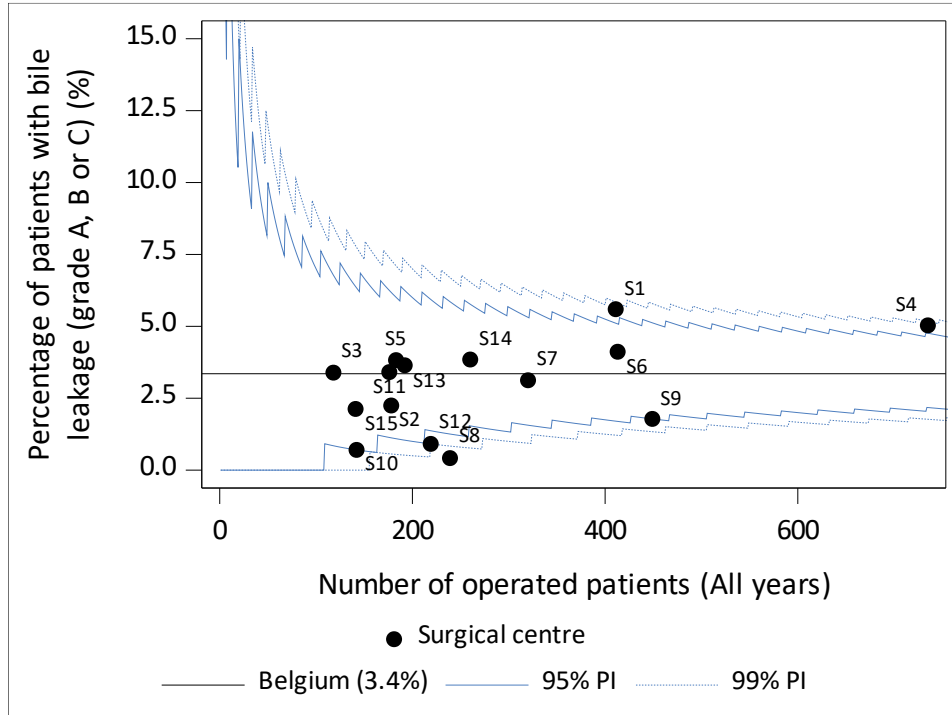


Figure 36: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

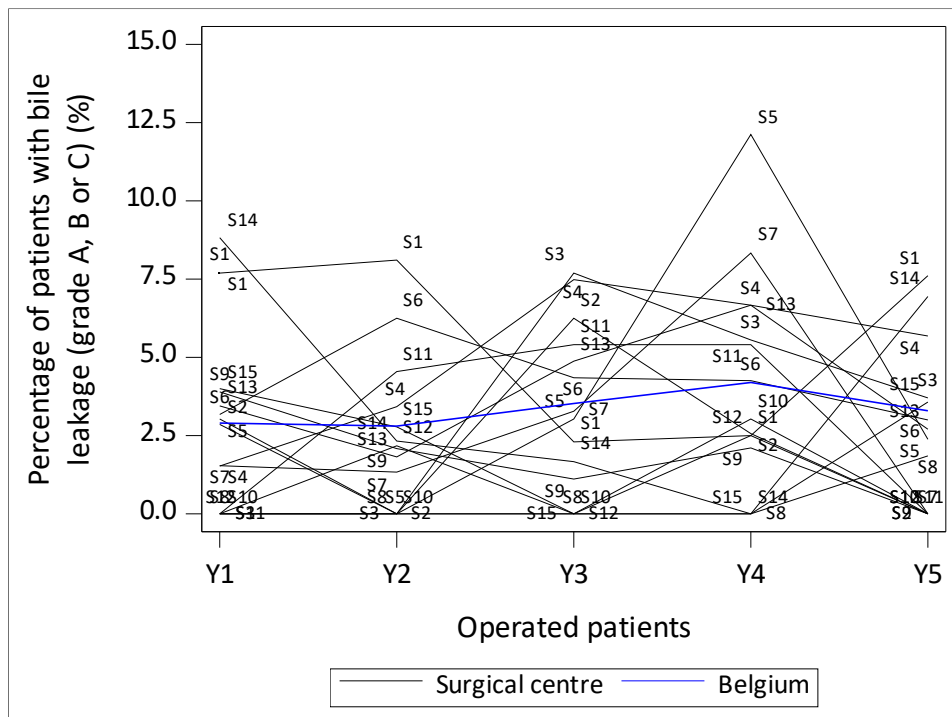
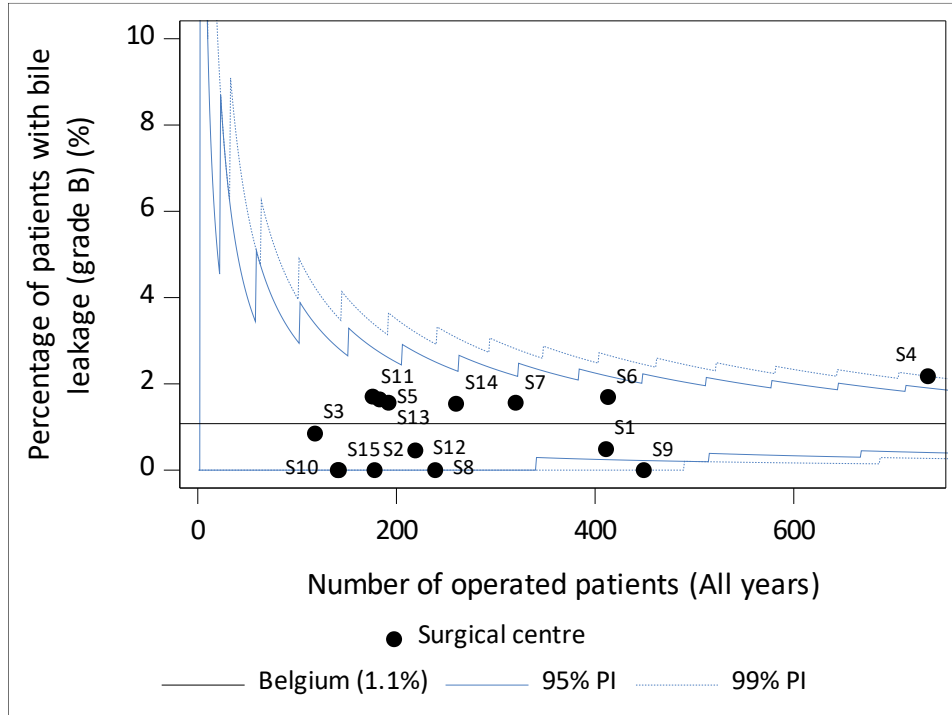


Figure 37: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

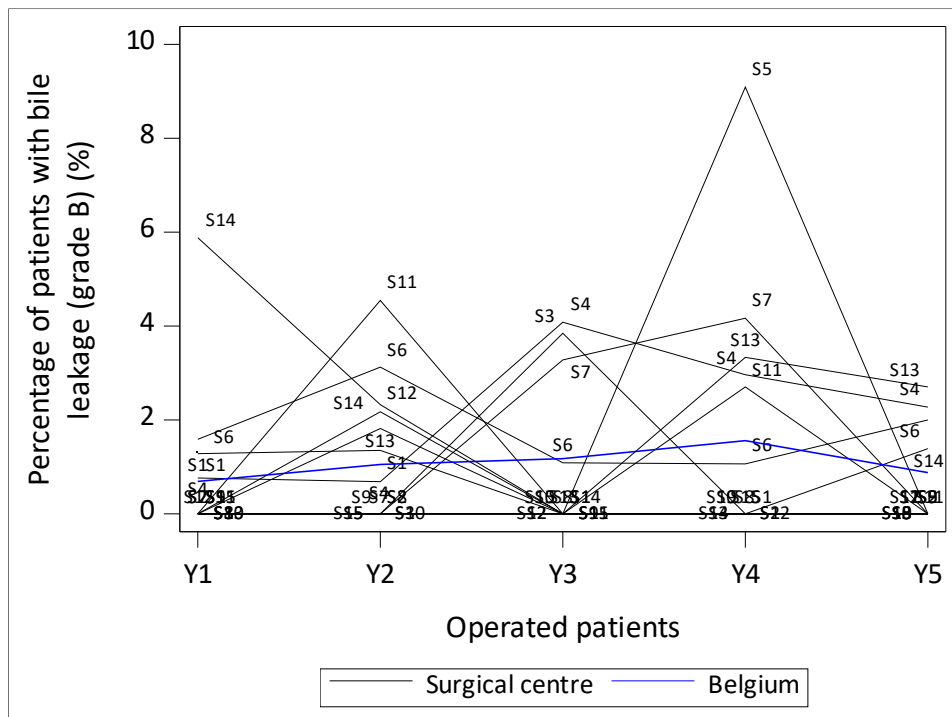
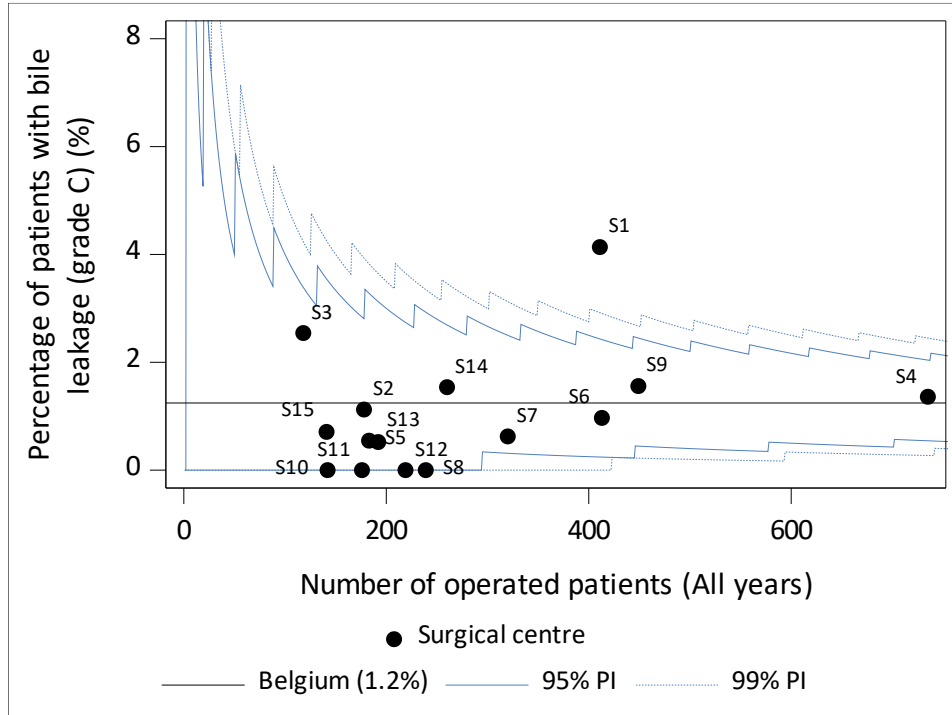


Figure 38: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

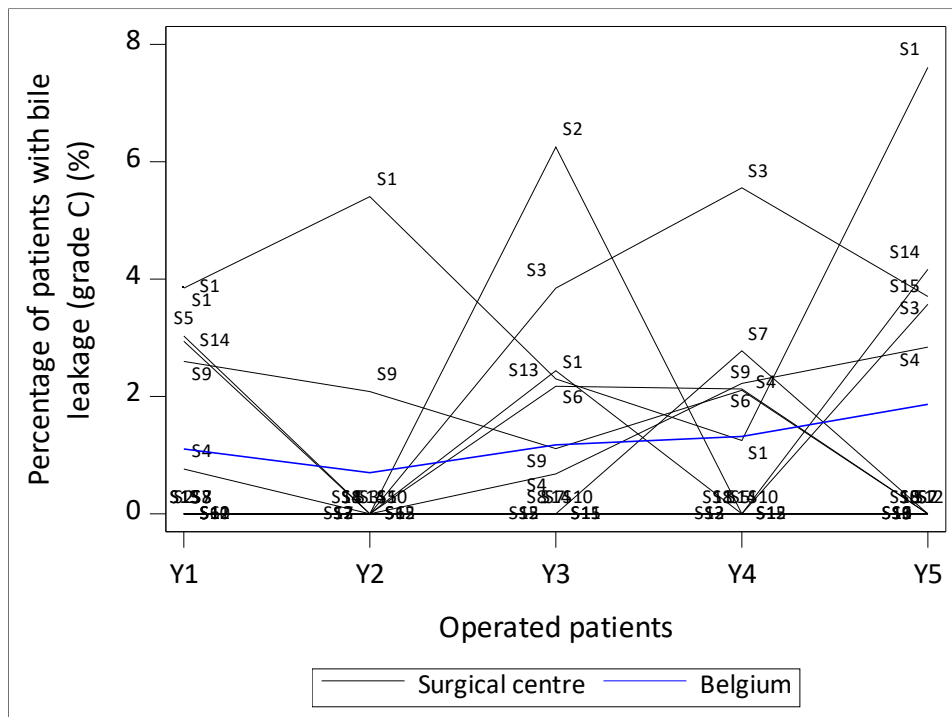
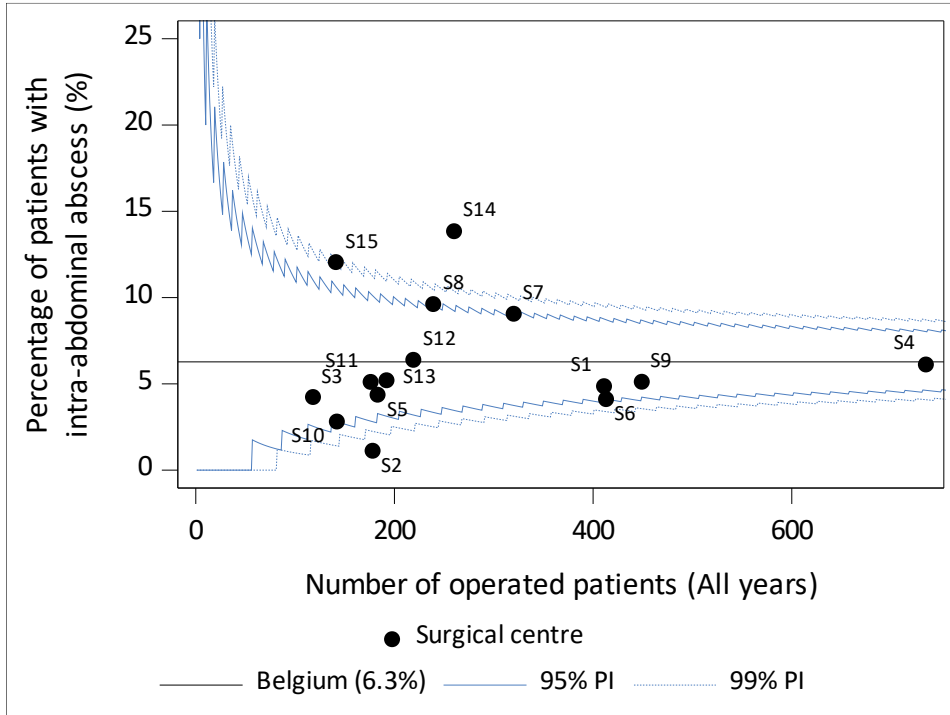
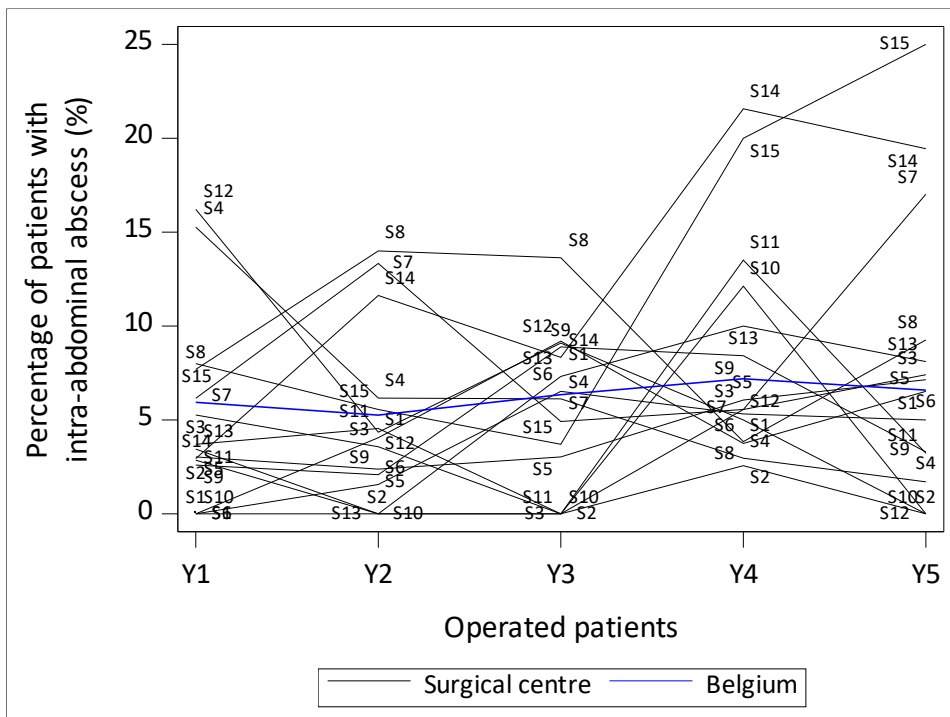


Figure 39: Funnel and spaghetti plot of operated patients with **malignant and benign tumours with intra-abdominal abscess (within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

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

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|---|---|------------|-------------|---------------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| Operated patients with a malignant/benign tumour | 4,176 | 609 | 14.6 | [13.5, 15.7] |
| Expert centres | | | | . |
| S1 | 411 | 63 | 15.3 | [12.0, 19.2] |
| S2 | 178 | 21 | 11.8 | [7.5, 17.5] |
| S3 | 118 | 11 | 9.3 | [4.7, 16.1] |
| S4 | 735 | 141 | 19.2 | [16.4, 22.2] |
| S5 | 183 | 32 | 17.5 | [12.3, 23.8] |
| S6 | 413 | 84 | 20.3 | [16.6, 24.5] |
| S7 | 320 | 31 | 9.7 | [6.7, 13.5] |
| S8 | 239 | 24 | 10.0 | [6.5, 14.6] |
| S9 | 449 | 68 | 15.1 | [12.0, 18.8] |
| S10 | 142 | 5 | 3.5 | [1.2, 8.0] |
| S11 | 176 | 23 | 13.1 | [8.5, 19.0] |
| S12 | 219 | 28 | 12.8 | [8.7, 17.9] |
| S13 | 192 | 21 | 10.9 | [6.9, 16.2] |
| S14 | 260 | 39 | 15.0 | [10.9, 19.9] |
| S15 | 141 | 18 | 12.8 | [7.7, 19.4] |
| Convention year | | | | |
| Year 1 | 724 | 98 | 13.5 | [11.1, 16.2] |
| Year 2 | 856 | 114 | 13.3 | [11.1, 15.8] |
| Year 3 | 851 | 125 | 14.7 | [12.4, 17.2] |
| Year 4 | 834 | 112 | 13.4 | [11.2, 15.9] |
| Year 5 | 911 | 160 | 17.6 | [15.1, 20.2] |
| Sex | | | | |
| Male | 2,249 | 366 | 16.3 | [14.8, 17.9] |
| Female | 1,927 | 243 | 12.6 | [11.2, 14.2] |
| Age at surgery | | | | |
| <=69 | 2,346 | 317 | 13.5 | [12.2, 15.0] |
| 70-79 | 1,448 | 230 | 15.9 | [14.0, 17.9] |
| >=80 | 382 | 62 | 16.2 | [12.7, 20.3] |
| Lesion to treat (in (peri-)pancreas) | | | | |
| Primary tumour | 4,064 | 589 | 14.5 | [13.4, 15.6] |
| Relapse of primary tumour | 54 | 9 | 16.7 | [7.9, 29.3] |
| Metastasis | 58 | 11 | 19.0 | [9.9, 31.4] |

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|---|---|-----|---------|--------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| Morphology | | | | |
| Adenocarcinoma | 2,706 | 407 | 15.0 | [13.7, 16.4] |
| Neuroendocrine tumour | 535 | 74 | 13.8 | [11.0, 17.1] |
| Benign tumour | 603 | 81 | 13.4 | [10.8, 16.4] |
| Other or unspecified | 332 | 47 | 14.2 | [10.6, 18.4] |
| Primary tumour localisation | | | | |
| C17.0 Duodenum | 180 | 34 | 18.9 | [13.5, 25.4] |
| C24.0 Extrahepatic bile duct | 214 | 40 | 18.7 | [13.7, 24.6] |
| C24.1 (Peri-) ampullary region | 345 | 64 | 18.6 | [14.6, 23.1] |
| C25.0 Head of pancreas | 1,573 | 249 | 15.8 | [14.1, 17.7] |
| C25.1 Body of pancreas | 373 | 47 | 12.6 | [9.4, 16.4] |
| C25.2 Tail of pancreas | 542 | 58 | 10.7 | [8.2, 13.6] |
| C25.3 Pancreatic duct | 18 | 1 | 5.6 | [0.1, 27.3] |
| C25.4 Islands of Langerhans | 34 | 1 | 2.9 | [0.1, 15.3] |
| C25.7-9 Other specified parts of pancreas | 182 | 19 | 10.4 | [6.4, 15.8] |
| Other | 112 | 15 | 13.4 | [7.7, 21.1] |
| Missing or benign | 603 | 81 | 13.4 | [10.8, 16.4] |
| Clinical stage | | | | |
| 0 | 84 | 16 | 19.0 | [11.3, 29.1] |
| I | 1,717 | 249 | 14.5 | [12.9, 16.3] |
| II | 985 | 152 | 15.4 | [13.2, 17.8] |
| III | 380 | 55 | 14.5 | [11.1, 18.4] |
| IV | 96 | 14 | 14.6 | [8.2, 23.3] |
| X | 204 | 26 | 12.7 | [8.5, 18.1] |
| TNM not applicable or relapse* | 710 | 97 | 13.7 | [11.2, 16.4] |
| Resection margin ## | | | | |
| R0 | 2,584 | 377 | 14.6 | [13.3, 16.0] |
| R1 | 965 | 148 | 15.3 | [13.1, 17.8] |
| R2 | 13 | 3 | 23.1 | [5.0, 53.8] |
| Missing | 11 | 0 | 0.0 | [0.0, 28.5] |
| Prior surgery or other treatment ** | | | | |
| Prior abdominal surgery | 605 | 89 | 14.7 | [12.0, 17.8] |
| Other treatment modality (that could affect the pancreas) | 558 | 100 | 17.9 | [14.8, 21.4] |
| Neoadjuvant treatment | | | | |
| Chemoradiotherapy | 88 | 14 | 15.9 | [9.0, 25.2] |
| Chemotherapy | 586 | 71 | 12.1 | [9.6, 15.0] |
| Radiotherapy | 4 | 0 | 0.0 | [0.0, 60.2] |
| No chemo or radiation treatment | 3,498 | 524 | 15.0 | [13.8, 16.2] |
| Charlson Comorbidity Index | | | | |
| 0 | 1,729 | 242 | 14.0 | [12.4, 15.7] |
| 1 | 1,005 | 139 | 13.8 | [11.8, 16.1] |

| Severe surgical complications (Clavien-Dindo IIIb-V) | | | | |
|---|-------|-----|---------|--------------|
| Belgium | | | | |
| Characteristic | N | n | n/N (%) | 95% CI |
| 2 | 669 | 95 | 14.2 | [11.6, 17.1] |
| 3 | 343 | 60 | 17.5 | [13.6, 21.9] |
| 4 | 205 | 32 | 15.6 | [10.9, 21.3] |
| 5 | 86 | 22 | 25.6 | [16.8, 36.1] |
| 6 | 61 | 8 | 13.1 | [5.8, 24.2] |
| 7 | 37 | 5 | 13.5 | [4.5, 28.8] |
| 8 | 23 | 2 | 8.7 | [1.1, 28.0] |
| 9 | 10 | 2 | 20.0 | [2.5, 55.6] |
| 10 | 5 | 1 | 20.0 | [0.5, 71.6] |
| 11 | 1 | 0 | 0.0 | [0.0, 97.5] |
| 12 | 2 | 1 | 50.0 | [1.3, 98.7] |
| WHO score at surgery | | | | |
| 0 - Asymptomatic, normal activity | 1,245 | 178 | 14.3 | [12.4, 16.4] |
| 1 - Symptomatic, but ambulant | 2,488 | 349 | 14.0 | [12.7, 15.5] |
| 2 - Symptomatic, bedbound < 50% day | 380 | 68 | 17.9 | [14.2, 22.1] |
| 3 - Symptomatic, bedbound > 50% day | 61 | 13 | 21.3 | [11.9, 33.7] |
| 4 - Completely dependent, 100% bedbound | 2 | 1 | 50.0 | [1.3, 98.7] |
| ASA score | | | | |
| 1 - Healthy person | 269 | 31 | 11.5 | [8.0, 16.0] |
| 2 - Mild systemic disease, normal activity | 2,189 | 279 | 12.7 | [11.4, 14.2] |
| 3 - Serious systemic disease, limited activity | 1,670 | 289 | 17.3 | [15.5, 19.2] |
| 4 - Life-threatening illness, handicapped | 48 | 10 | 20.8 | [10.5, 35.0] |
| Resectability status ** | | | | |
| Before neoadjuvant treatment | | | | |
| Upfront resectable | 135 | 16 | 11.9 | [6.9, 18.5] |
| Borderline resectable | 326 | 41 | 12.6 | [9.2, 16.7] |
| Unresectable | 82 | 9 | 11.0 | [5.1, 19.8] |
| No neoadjuvant treatment | 2,118 | 329 | 15.5 | [14.0, 17.1] |
| Before surgery | | | | |
| Upfront resectable | 2,280 | 337 | 14.8 | [13.3, 16.3] |
| Borderline resectable | 352 | 56 | 15.9 | [12.2, 20.2] |
| Unresectable | 22 | 2 | 9.1 | [1.1, 29.2] |
| Missing | 7 | 0 | 0.0 | [0.0, 41.0] |
| Type of surgery | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 1,161 | 148 | 12.7 | [10.9, 14.8] |
| Minimally invasive surgery (MIS) - Hybrid | 5 | 2 | 40.0 | [5.3, 85.3] |
| Minimally invasive surgery (MIS) - Robotic | 488 | 77 | 15.8 | [12.7, 19.3] |
| Open | 2,331 | 342 | 14.7 | [13.3, 16.2] |
| Conversion from MIS to open surgery | 191 | 40 | 20.9 | [15.4, 27.4] |
| Simultaneous venous resection | | | | |
| No | 3,660 | 521 | 14.2 | [13.1, 15.4] |

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|---|---|---------|---------|--------------|
| | N | Belgium | | |
| | | n | n/N (%) | 95% CI |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 516 | 88 | 17.1 | [13.9, 20.6] |
| - With primary wedge-reconstruction | 165 | 20 | 12.1 | [7.6, 18.1] |
| - With primary end-to-end reconstruction | 215 | 36 | 16.7 | [12.0, 22.4] |
| - With vascular autograft interposition | 12 | 2 | 16.7 | [2.1, 48.4] |
| - With vascular allograft interposition | 61 | 20 | 32.8 | [21.3, 46.0] |
| - With synthetic/prosthetic interposition | 10 | 2 | 20.0 | [2.5, 55.6] |
| - With peritoneal patch wedge-reconstruction | 43 | 7 | 16.3 | [6.8, 30.7] |
| - Without reconstruction | 10 | 1 | 10.0 | [0.3, 44.5] |
| <i>Simultaneous arterial resection **</i> | | | | |
| No | 4,106 | 600 | 14.6 | [13.5, 15.7] |
| Hepatic artery resection | 28 | 2 | 7.1 | [0.9, 23.5] |
| - With primary end-to-end reconstruction | 17 | 2 | 11.8 | [1.5, 36.4] |
| - With vascular allograft interposition | 1 | 0 | 0.0 | [0.0, 97.5] |
| - Without reconstruction | 10 | 0 | 0.0 | [0.0, 30.8] |
| Coeliac trunk resection | 32 | 5 | 15.6 | [5.3, 32.8] |
| - With primary end-to-end reconstruction | 2 | 0 | 0.0 | [0.0, 84.2] |
| - Without reconstruction | 30 | 5 | 16.7 | [5.6, 34.7] |
| Superior mesenteric artery (SMA) resection | 9 | 2 | 22.2 | [2.8, 60.0] |
| - With primary wedge-reconstruction | 1 | 0 | 0.0 | [0.0, 97.5] |
| - With primary end-to-end reconstruction | 3 | 1 | 33.3 | [0.8, 90.6] |
| - With vascular autograft interposition | 2 | 1 | 50.0 | [1.3, 98.7] |
| - Without reconstruction | 3 | 0 | 0.0 | [0.0, 70.8] |
| <i>Simultaneous other organ resection **</i> | | | | |
| No | 2,541 | 398 | 15.7 | [14.3, 17.1] |
| Colon | 107 | 28 | 26.2 | [18.1, 35.6] |
| Stomach | 596 | 90 | 15.1 | [12.3, 18.2] |
| Adrenal gland | 88 | 8 | 9.1 | [4.0, 17.1] |
| Spleen | 932 | 100 | 10.7 | [8.8, 12.9] |
| Other | 262 | 34 | 13.0 | [9.2, 17.7] |
| <i>RIZIV code for complex surgery</i> | | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,762 | 460 | 16.7 | [15.3, 18.1] |
| Pancreaticoduodenectomy | 2,499 | 409 | 16.4 | [14.9, 17.9] |
| Total Pancreatectomy | 263 | 51 | 19.4 | [14.8, 24.7] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 400 | 43 | 10.8 | [7.9, 14.2] |
| 242874-242885: Hemipancreatectomy left | 950 | 100 | 10.5 | [8.6, 12.7] |
| 242896-242900: Enucleation of a pancreatic tumour | 64 | 6 | 9.4 | [3.5, 19.3] |
| <i>Antithrombotic medication</i> | | | | |
| No | 2,945 | 401 | 13.6 | [12.4, 14.9] |
| Yes | 1,231 | 208 | 16.9 | [14.8, 19.1] |

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|---|---|-----|---------|--------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| <i>Was the patient referred?</i> | | | | |
| No | 1,886 | 274 | 14.5 | [13.0, 16.2] |
| Yes | 2,290 | 335 | 14.6 | [13.2, 16.1] |

* Tumour staging not possible.

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

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

Results for this variable are only for malignant tumours

4. Non-tumoural pathology

4.1. Descriptives

4.1.1. Patient case mix description

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

| Characteristic | Belgium (N=1,443) | | | | | | | | | |
|--|----------------------|------|------------|------|------------|------|------------|------|------------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Patients discussed on a MC expert | 221 | | 251 | | 321 | | 315 | | 335 | |
| Surgery status | | | | | | | | | | |
| Patients with surgery | 63 | 28.5 | 72 | 28.7 | 69 | 21.5 | 85 | 27.0 | 100 | 29.9 |
| Patients without surgery | 158 | 71.5 | 179 | 71.3 | 252 | 78.5 | 230 | 73.0 | 235 | 70.1 |
| Expert centres | | | | | | | | | | |
| S1 | 10 | 4.5 | 15 | 6.0 | 19 | 5.9 | 18 | 5.7 | 15 | 4.5 |
| S2 | 24 | 10.9 | 25 | 10.0 | 42 | 13.1 | 49 | 15.6 | 51 | 15.2 |
| S3 | 13 | 5.9 | 25 | 10.0 | 20 | 6.2 | 17 | 5.4 | 17 | 5.1 |
| S4 | 10 | 4.5 | 26 | 10.4 | 39 | 12.1 | 42 | 13.3 | 39 | 11.6 |
| S5 | 4 | 1.8 | 4 | 1.6 | 1 | 0.3 | 1 | 0.3 | 3 | 0.9 |
| S6 | 13 | 5.9 | 9 | 3.6 | 10 | 3.1 | 7 | 2.2 | 2 | 0.6 |
| S7 | 7 | 3.2 | 10 | 4.0 | 14 | 4.4 | 25 | 7.9 | 25 | 7.5 |
| S8 | 14 | 6.3 | 24 | 9.6 | 40 | 12.5 | 30 | 9.5 | 35 | 10.4 |
| S9 | 42 | 19.0 | 25 | 10.0 | 43 | 13.4 | 24 | 7.6 | 48 | 14.3 |
| S10 | 35 | 15.8 | 22 | 8.8 | 19 | 5.9 | 22 | 7.0 | 35 | 10.4 |
| S11 | 9 | 4.1 | 4 | 1.6 | 1 | 0.3 | 4 | 1.3 | 0 | 0.0 |
| S12 | 8 | 3.6 | 19 | 7.6 | 28 | 8.7 | 18 | 5.7 | 23 | 6.9 |
| S13 | 10 | 4.5 | 18 | 7.2 | 16 | 5.0 | 28 | 8.9 | 12 | 3.6 |
| S14 | 17 | 7.7 | 24 | 9.6 | 28 | 8.7 | 29 | 9.2 | 25 | 7.5 |
| S15 | 5 | 2.3 | 1 | 0.4 | 1 | 0.3 | 1 | 0.3 | 5 | 1.5 |
| Sex | | | | | | | | | | |
| Male | 150 | 67.9 | 167 | 66.5 | 198 | 61.7 | 196 | 62.2 | 207 | 61.8 |
| Female | 71 | 32.1 | 84 | 33.5 | 123 | 38.3 | 119 | 37.8 | 128 | 38.2 |
| Age at MC | | | | | | | | | | |
| <=69 | 165 | 74.7 | 183 | 72.9 | 221 | 68.8 | 214 | 67.9 | 250 | 74.6 |
| 70-79 | 38 | 17.2 | 51 | 20.3 | 71 | 22.1 | 76 | 24.1 | 60 | 17.9 |
| >=80 | 16 | 7.2 | 14 | 5.6 | 26 | 8.1 | 21 | 6.7 | 25 | 7.5 |
| Missing | 2 | 0.9 | 3 | 1.2 | 3 | 0.9 | 4 | 1.3 | 0 | 0.0 |
| Indication | | | | | | | | | | |
| Pancreatitis | 109 | 49.3 | 149 | 59.4 | 156 | 48.6 | 157 | 49.8 | 154 | 46.0 |

| Belgium (N=1,443) | | | | | | | | | | |
|---|--------|------|--------|------|--------|------|--------|------|--------|------|
| Characteristic | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Other | 112 | 50.7 | 102 | 40.6 | 165 | 51.4 | 158 | 50.2 | 181 | 54.0 |
| <i>Was the patient referred?</i> | | | | | | | | | | |
| No | 151 | 68.3 | 172 | 68.5 | 219 | 68.2 | 224 | 71.1 | 210 | 62.7 |
| Yes | 70 | 31.7 | 78 | 31.1 | 102 | 31.8 | 91 | 28.9 | 125 | 37.3 |
| Missing | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |

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

| Characteristic | Belgium (N=389) | | | | | | | | | |
|------------------------------|--------------------|------|-----------|------|-----------|------|-----------|------|------------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| Patients with surgery | 63 | | 72 | | 69 | | 85 | | 100 | |
| Expert centres | | | | | | | | | | |
| S1 | 7 | 11.1 | 9 | 12.5 | 11 | 15.9 | 10 | 11.8 | 11 | 11.0 |
| S2 | 1 | 1.6 | 3 | 4.2 | 1 | 1.4 | 2 | 2.4 | 2 | 2.0 |
| S3 | 2 | 3.2 | 0 | 0.0 | 1 | 1.4 | 2 | 2.4 | 2 | 2.0 |
| S4 | 4 | 6.3 | 8 | 11.1 | 14 | 20.3 | 19 | 22.4 | 16 | 16.0 |
| S5 | 4 | 6.3 | 4 | 5.6 | 1 | 1.4 | 1 | 1.2 | 2 | 2.0 |
| S6 | 2 | 3.2 | 5 | 6.9 | 3 | 4.3 | 6 | 7.1 | 1 | 1.0 |
| S7 | 5 | 7.9 | 5 | 6.9 | 3 | 4.3 | 7 | 8.2 | 7 | 7.0 |
| S8 | 6 | 9.5 | 6 | 8.3 | 3 | 4.3 | 6 | 7.1 | 4 | 4.0 |
| S9 | 10 | 15.9 | 10 | 13.9 | 17 | 24.6 | 16 | 18.8 | 24 | 24.0 |
| S10 | 3 | 4.8 | 3 | 4.2 | 3 | 4.3 | 3 | 3.5 | 11 | 11.0 |
| S11 | 3 | 4.8 | 1 | 1.4 | 0 | 0.0 | 3 | 3.5 | 0 | 0.0 |
| S12 | 7 | 11.1 | 6 | 8.3 | 7 | 10.1 | 5 | 5.9 | 12 | 12.0 |
| S13 | 1 | 1.6 | 3 | 4.2 | 0 | 0.0 | 1 | 1.2 | 1 | 1.0 |
| S14 | 5 | 7.9 | 8 | 11.1 | 4 | 5.8 | 3 | 3.5 | 3 | 3.0 |
| S15 | 3 | 4.8 | 1 | 1.4 | 1 | 1.4 | 1 | 1.2 | 4 | 4.0 |
| Sex | | | | | | | | | | |
| Male | 42 | 66.7 | 50 | 69.4 | 47 | 68.1 | 57 | 67.1 | 71 | 71.0 |
| Female | 21 | 33.3 | 22 | 30.6 | 22 | 31.9 | 28 | 32.9 | 29 | 29.0 |
| Age at surgery | | | | | | | | | | |

| Characteristic | Belgium (N=389) | | | | | | | | | |
|---|--------------------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| <=69 | 56 | 88.9 | 63 | 87.5 | 62 | 89.9 | 76 | 89.4 | 82 | 82.0 |
| 70-79 | 7 | 11.1 | 9 | 12.5 | 6 | 8.7 | 6 | 7.1 | 14 | 14.0 |
| >=80 | 0 | 0.0 | 0 | 0.0 | 1 | 1.4 | 3 | 3.5 | 4 | 4.0 |
| Indication | | | | | | | | | | |
| Pancreatitis | 36 | 57.1 | 51 | 70.8 | 44 | 63.8 | 56 | 65.9 | 63 | 63.0 |
| Other | 27 | 42.9 | 21 | 29.2 | 25 | 36.2 | 29 | 34.1 | 37 | 37.0 |
| Prior surgery or other treatment ** | | | | | | | | | | |
| Prior abdominal surgery | 10 | 15.9 | 15 | 20.8 | 19 | 27.5 | 15 | 17.6 | 21 | 21.0 |
| Other treatment modality (that could affect the pancreas) | 11 | 17.5 | 18 | 25.0 | 14 | 20.3 | 16 | 18.8 | 19 | 19.0 |
| Charlson Comorbidity Index | | | | | | | | | | |
| 0 | 22 | 34.9 | 30 | 41.7 | 31 | 44.9 | 40 | 47.1 | 39 | 39.0 |
| 1 | 18 | 28.6 | 17 | 23.6 | 13 | 18.8 | 19 | 22.4 | 30 | 30.0 |
| 2 | 13 | 20.6 | 9 | 12.5 | 8 | 11.6 | 14 | 16.5 | 18 | 18.0 |
| 3 | 4 | 6.3 | 8 | 11.1 | 9 | 13.0 | 7 | 8.2 | 8 | 8.0 |
| 4 | 3 | 4.8 | 5 | 6.9 | 4 | 5.8 | 4 | 4.7 | 2 | 2.0 |
| 5 | 0 | 0.0 | 1 | 1.4 | 2 | 2.9 | 0 | 0.0 | 3 | 3.0 |
| 6 | 3 | 4.8 | 1 | 1.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.2 | 0 | 0.0 |
| 9 | 0 | 0.0 | 0 | 0.0 | 1 | 1.4 | 0 | 0.0 | 0 | 0.0 |
| 10 | 0 | 0.0 | 0 | 0.0 | 1 | 1.4 | 0 | 0.0 | 0 | 0.0 |
| 11 | 0 | 0.0 | 1 | 1.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| WHO score at surgery | | | | | | | | | | |
| 0 - Asymptomatic, normal activity | 11 | 17.5 | 15 | 20.8 | 21 | 30.4 | 17 | 20.0 | 38 | 38.0 |
| 1 - Symptomatic, but ambulant | 39 | 61.9 | 49 | 68.1 | 38 | 55.1 | 61 | 71.8 | 51 | 51.0 |
| 2 - Symptomatic, bedbound < 50% day | 9 | 14.3 | 7 | 9.7 | 8 | 11.6 | 5 | 5.9 | 8 | 8.0 |
| 3 - Symptomatic, bedbound > 50% day | 3 | 4.8 | 1 | 1.4 | 1 | 1.4 | 1 | 1.2 | 1 | 1.0 |

| Characteristic | Belgium (N=389) | | | | | | | | | |
|--|--------------------|------|--------|------|--------|-------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| 4 - Completely dependent, 100% bedbound | 1 | 1.6 | 0 | 0.0 | 1 | 1.4 | 1 | 1.2 | 2 | 2.0 |
| ASA score | | | | | | | | | | |
| 1 - Healthy person | 5 | 7.9 | 3 | 4.2 | 4 | 5.8 | 3 | 3.5 | 7 | 7.0 |
| 2 - Mild systemic disease, normal activity | 34 | 54.0 | 40 | 55.6 | 34 | 49.3 | 44 | 51.8 | 53 | 53.0 |
| 3 - Serious systemic disease, limited activity | 21 | 33.3 | 28 | 38.9 | 30 | 43.5 | 36 | 42.4 | 39 | 39.0 |
| 4 - Life-threatening illness, handicapped | 3 | 4.8 | 1 | 1.4 | 1 | 1.4 | 1 | 1.2 | 1 | 1.0 |
| 5 - Dying | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.2 | 0 | 0.0 |
| Type of surgery | | | | | | | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 15 | 23.8 | 13 | 18.1 | 18 | 26.1 | 14 | 16.5 | 16 | 16.0 |
| Minimally invasive surgery (MIS) - Hybrid | 0 | 0.0 | 1 | 1.4 | 1 | 1.4 | 0 | 0.0 | 0 | 0.0 |
| Minimally invasive surgery (MIS) - Robotic | 3 | 4.8 | 8 | 11.1 | 5 | 7.2 | 12 | 14.1 | 19 | 19.0 |
| Open | 45 | 71.4 | 46 | 63.9 | 40 | 58.0 | 49 | 57.6 | 61 | 61.0 |
| Conversion from MIS to open surgery | 0 | 0.0 | 4 | 5.6 | 5 | 7.2 | 10 | 11.8 | 4 | 4.0 |
| Simultaneous vascular resection | | | | | | | | | | |
| No vascular reconstruction | 60 | 95.2 | 69 | 95.8 | 69 | 100.0 | 80 | 94.1 | 92 | 92.0 |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 3 | 4.8 | 3 | 4.2 | 0 | 0.0 | 4 | 4.7 | 6 | 6.0 |
| Simultaneous arterial resection ** | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 2.0 |
| Missing | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.2 | 0 | 0.0 |
| Simultaneous other organ resection ** | | | | | | | | | | |
| No | 42 | 66.7 | 42 | 58.3 | 40 | 58.0 | 57 | 67.1 | 67 | 67.0 |
| Colon | 1 | 1.6 | 4 | 5.6 | 3 | 4.3 | 3 | 3.5 | 4 | 4.0 |
| Stomach | 6 | 9.5 | 9 | 12.5 | 8 | 11.6 | 8 | 9.4 | 13 | 13.0 |
| Adrenal gland | 1 | 1.6 | 2 | 2.8 | 3 | 4.3 | 1 | 1.2 | 1 | 1.0 |
| Spleen | 14 | 22.2 | 19 | 26.4 | 19 | 27.5 | 17 | 20.0 | 22 | 22.0 |
| Other | 6 | 9.5 | 5 | 6.9 | 6 | 8.7 | 4 | 4.7 | 7 | 7.0 |
| RIZIV code for complex surgery | | | | | | | | | | |

| Characteristic | Belgium (N=389) | | | | | | | | | |
|---|--------------------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| 242830-242841: Pancreaticoduodenectomy | 37 | 58.7 | 40 | 55.6 | 38 | 55.1 | 46 | 54.1 | 55 | 55.0 |
| Pancreaticoduodenectomy | 34 | 91.9 | 35 | 87.5 | 35 | 92.1 | 40 | 87.0 | 48 | 87.3 |
| Total Pancreatectomy | 3 | 8.1 | 5 | 12.5 | 3 | 7.9 | 6 | 13.0 | 7 | 12.7 |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 5 | 7.9 | 13 | 18.1 | 12 | 17.4 | 17 | 20.0 | 20 | 20.0 |
| 242874-242885: Hemipancreatectomy left | 21 | 33.3 | 19 | 26.4 | 18 | 26.1 | 21 | 24.7 | 22 | 22.0 |
| 242896-242900: Enucleation of a pancreatic tumour | 0 | 0.0 | 0 | 0.0 | 1 | 1.4 | 1 | 1.2 | 3 | 3.0 |
| Antithrombotic medication | | | | | | | | | | |
| No | 50 | 79.4 | 57 | 79.2 | 53 | 76.8 | 63 | 74.1 | 78 | 78.0 |
| Yes | 13 | 20.6 | 15 | 20.8 | 16 | 23.2 | 22 | 25.9 | 22 | 22.0 |
| Was the patient referred? | | | | | | | | | | |
| No | 39 | 61.9 | 41 | 56.9 | 43 | 62.3 | 56 | 65.9 | 63 | 63.0 |
| Yes | 24 | 38.1 | 31 | 43.1 | 26 | 37.7 | 29 | 34.1 | 37 | 37.0 |

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

4.1.2. Completeness of registration

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

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

Table 31. Completeness of registration forms: number of registrations in complex surgery database that were complete in the fifth convention year, by expert centre.

| Patient group | Belgium | | |
|--|--------------|------------|---------|
| | N registered | n complete | n/N (%) |
| <i>Patients discussed on a MC expert in Year 5</i> | 335 | 335 | 100.0 |
| <i>Surgery status</i> | | | |
| Patients with surgery | 100 | 100 | 100.0 |
| Patients without surgery | 235 | 235 | 100.0 |
| <i>Expert centres</i> | | | |
| S1 | 15 | 15 | 100.0 |
| S2 | 51 | 51 | 100.0 |
| S3 | 17 | 17 | 100.0 |
| S4 | 39 | 39 | 100.0 |
| S5 | 3 | 3 | 100.0 |
| S6 | 2 | 2 | 100.0 |
| S7 | 25 | 25 | 100.0 |
| S8 | 35 | 35 | 100.0 |
| S9 | 48 | 48 | 100.0 |
| S10 | 35 | 35 | 100.0 |
| S11 | 0 | 0 | 0.0 |
| S12 | 23 | 23 | 100.0 |
| S13 | 12 | 12 | 100.0 |
| S14 | 25 | 25 | 100.0 |
| S15 | 5 | 5 | 100.0 |

4.2. Process indicators

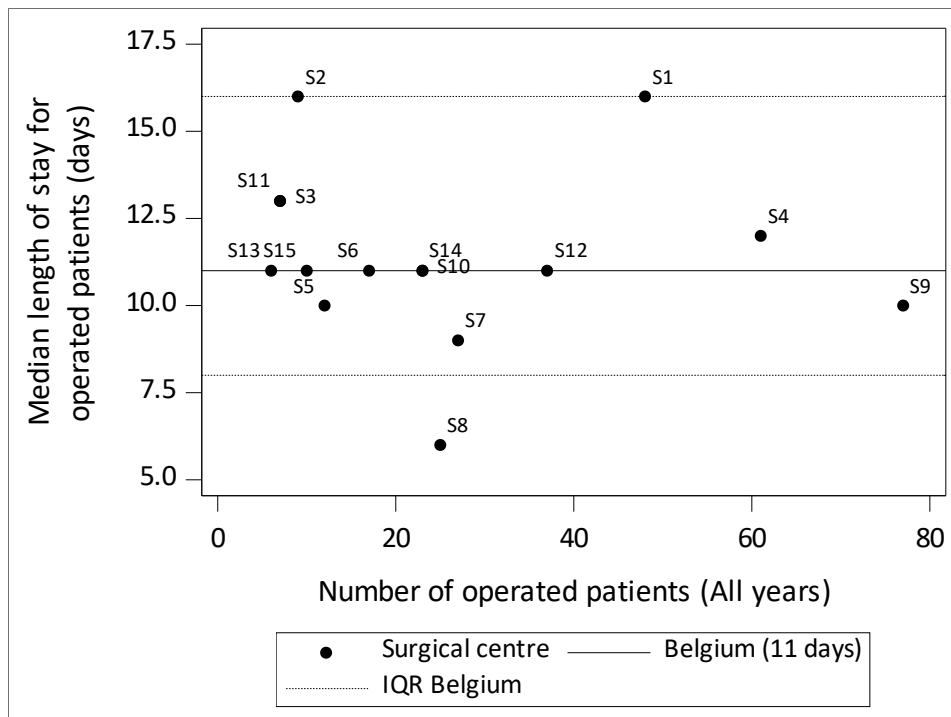
4.2.1. Length of stay in the expert centre

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

| Characteristic | N | Belgium | |
|--|-----|---------------|---------|
| | | Median (days) | IQR* |
| Operated patients with non-tumoural pathology¹ | 389 | 11 | [8, 16] |
| Convention year | | | |
| Year 1 | 63 | 12 | [9, 15] |
| Year 2 | 72 | 12 | [7, 16] |
| Year 3 | 69 | 10 | [7, 14] |
| Year 4 | 85 | 10 | [8, 15] |
| Year 5 | 100 | 12 | [8, 16] |

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

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



4.3. Outcome indicators

4.3.1. Postoperative mortality

4.3.1.1. Unadjusted 30-day postoperative mortality

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

4.3.1.2. Unadjusted 90-day postoperative mortality

There were only 9 postoperative deaths observed for all hospitals combined (N=3 for Y1, N=2 for Y2, N=0 for Y3, N=2 for Y4 and N=2 for Y5), therefore no results are given.

4.3.2. Survival

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

There were only 23 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2, N=5 for Y3, N=3 for Y4 and N=3 for Y5), therefore no results are given.

4.3.2.2. Unadjusted 1-year relative survival after surgery

There were only 23 all-cause deaths observed within the first year after surgery for all hospitals combined (N=6 for Y1, N=2 for Y2 and N=5 for Y3, N=3 for Y4 and N=3 for Y5), therefore no results are given.

4.3.3. Proportion of operated patients with surgical complications

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

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

| Complication type | Postoperative complications (90-day in-hospital) | | | |
|--|--|----|---------|--------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| Severe postoperative complications (CD IIIb-V) | 389 | 50 | 12.9 | [9.7, 16.6] |
| Year 1 | 63 | 9 | 14.3 | [6.7, 25.4] |
| Year 2 | 72 | 7 | 9.7 | [4.0, 19.0] |
| Year 3 | 69 | 7 | 10.1 | [4.2, 19.8] |
| Year 4 | 85 | 13 | 15.3 | [8.4, 24.7] |
| Year 5 | 100 | 14 | 14.0 | [7.9, 22.4] |
| Clinically relevant pancreatic fistula (Grade B or C) ^{1*} | 389 | 65 | 16.7 | [13.1, 20.8] |
| Grade B | 389 | 58 | 14.9 | [11.5, 18.8] |
| Year 1 | 63 | 4 | 6.3 | [1.8, 15.5] |
| Year 2 | 72 | 11 | 15.3 | [7.9, 25.7] |
| Year 3 | 69 | 8 | 11.6 | [5.1, 21.6] |
| Year 4 | 85 | 15 | 17.6 | [10.2, 27.4] |
| Year 5 | 100 | 20 | 20.0 | [12.7, 29.2] |
| Grade C | 389 | 7 | 1.8 | [0.7, 3.7] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 2 | 2.8 | [0.3, 9.7] |
| Year 3 | 69 | 1 | 1.4 | [0.0, 7.8] |
| Year 4 | 85 | 4 | 4.7 | [1.3, 11.6] |
| Year 5 | 100 | 0 | 0.0 | [0.0, 3.6] |
| Haemorrhage (Grade A, B or C) ^{2*} | 389 | 20 | 5.1 | [3.2, 7.8] |
| Grade A | 389 | 2 | 0.5 | [0.1, 1.8] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 1 | 1.4 | [0.0, 7.5] |
| Year 3 | 69 | 0 | 0.0 | [0.0, 5.2] |
| Year 4 | 85 | 1 | 1.2 | [0.0, 6.4] |
| Year 5 | 100 | 0 | 0.0 | [0.0, 3.6] |
| Grade B | 389 | 14 | 3.6 | [2.0, 6.0] |
| Year 1 | 63 | 2 | 3.2 | [0.4, 11.0] |
| Year 2 | 72 | 3 | 4.2 | [0.9, 11.7] |
| Year 3 | 69 | 1 | 1.4 | [0.0, 7.8] |
| Year 4 | 85 | 2 | 2.4 | [0.3, 8.2] |

| Postoperative complications (90-day in-hospital) | | | | |
|--|-----|----|---------|-------------|
| Belgium | | | | |
| Complication type | N | n | n/N (%) | 95% CI |
| Year 5 | 100 | 6 | 6.0 | [2.2, 12.6] |
| Grade C | 389 | 4 | 1.0 | [0.3, 2.6] |
| Year 1 | 63 | 1 | 1.6 | [0.0, 8.5] |
| Year 2 | 72 | 0 | 0.0 | [0.0, 5.0] |
| Year 3 | 69 | 0 | 0.0 | [0.0, 5.2] |
| Year 4 | 85 | 2 | 2.4 | [0.3, 8.2] |
| Year 5 | 100 | 1 | 1.0 | [0.0, 5.4] |
| <i>Delayed gastric emptying (Grade A, B or C) ^{3*}</i> | 389 | 45 | 11.6 | [8.6, 15.2] |
| Grade A | 389 | 24 | 6.2 | [4.0, 9.0] |
| Year 1 | 63 | 2 | 3.2 | [0.4, 11.0] |
| Year 2 | 72 | 8 | 11.1 | [4.9, 20.7] |
| Year 3 | 69 | 1 | 1.4 | [0.0, 7.8] |
| Year 4 | 85 | 6 | 7.1 | [2.6, 14.7] |
| Year 5 | 100 | 7 | 7.0 | [2.9, 13.9] |
| Grade B | 389 | 14 | 3.6 | [2.0, 6.0] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 2 | 2.8 | [0.3, 9.7] |
| Year 3 | 69 | 6 | 8.7 | [3.3, 18.0] |
| Year 4 | 85 | 2 | 2.4 | [0.3, 8.2] |
| Year 5 | 100 | 4 | 4.0 | [1.1, 9.9] |
| Grade C | 389 | 7 | 1.8 | [0.7, 3.7] |
| Year 1 | 63 | 1 | 1.6 | [0.0, 8.5] |
| Year 2 | 72 | 1 | 1.4 | [0.0, 7.5] |
| Year 3 | 69 | 1 | 1.4 | [0.0, 7.8] |
| Year 4 | 85 | 3 | 3.5 | [0.7, 10.0] |
| Year 5 | 100 | 1 | 1.0 | [0.0, 5.4] |
| <i>Bile leakage (Grade A, B or C) ^{4*}</i> | 389 | 6 | 1.5 | [0.6, 3.3] |
| Grade A | 389 | 2 | 0.5 | [0.1, 1.8] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 0 | 0.0 | [0.0, 5.0] |
| Year 3 | 69 | 0 | 0.0 | [0.0, 5.2] |
| Year 4 | 85 | 2 | 2.4 | [0.3, 8.2] |
| Year 5 | 100 | 0 | 0.0 | [0.0, 3.6] |
| Grade B | 389 | 2 | 0.5 | [0.1, 1.8] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 1 | 1.4 | [0.0, 7.5] |
| Year 3 | 69 | 0 | 0.0 | [0.0, 5.2] |
| Year 4 | 85 | 0 | 0.0 | [0.0, 4.2] |
| Year 5 | 100 | 1 | 1.0 | [0.0, 5.4] |
| Grade C | 389 | 2 | 0.5 | [0.1, 1.8] |

| Postoperative complications (90-day in-hospital) | | | | |
|---|-----|----|---------|-------------|
| Belgium | | | | |
| Complication type | N | n | n/N (%) | 95% CI |
| Year 1 | 63 | 1 | 1.6 | [0.0, 8.5] |
| Year 2 | 72 | 0 | 0.0 | [0.0, 5.0] |
| Year 3 | 69 | 0 | 0.0 | [0.0, 5.2] |
| Year 4 | 85 | 1 | 1.2 | [0.0, 6.4] |
| Year 5 | 100 | 0 | 0.0 | [0.0, 3.6] |
| <i>Intra-abdominal abscess *</i> | 389 | 29 | 7.5 | [5.0, 10.5] |
| Year 1 | 63 | 3 | 4.8 | [1.0, 13.3] |
| Year 2 | 72 | 6 | 8.3 | [3.1, 17.3] |
| Year 3 | 69 | 6 | 8.7 | [3.3, 18.0] |
| Year 4 | 85 | 9 | 10.6 | [5.0, 19.2] |
| Year 5 | 100 | 5 | 5.0 | [1.6, 11.3] |
| <i>Transferred to another hospital due to complications (CD I-IVb)</i> | 389 | 1 | 0.3 | [0.0, 1.4] |
| Year 1 | 63 | 0 | 0.0 | [0.0, 5.7] |
| Year 2 | 72 | 0 | 0.0 | [0.0, 5.0] |
| Year 3 | 69 | 1 | 1.4 | [0.0, 7.8] |
| Year 4 | 85 | 0 | 0.0 | [0.0, 4.2] |
| Year 5 | 100 | 0 | 0.0 | [0.0, 3.6] |

CD: Clavien-Dindo grade

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

² graded according to the ISGPS definitions

³ graded according to the ISGPS definitions

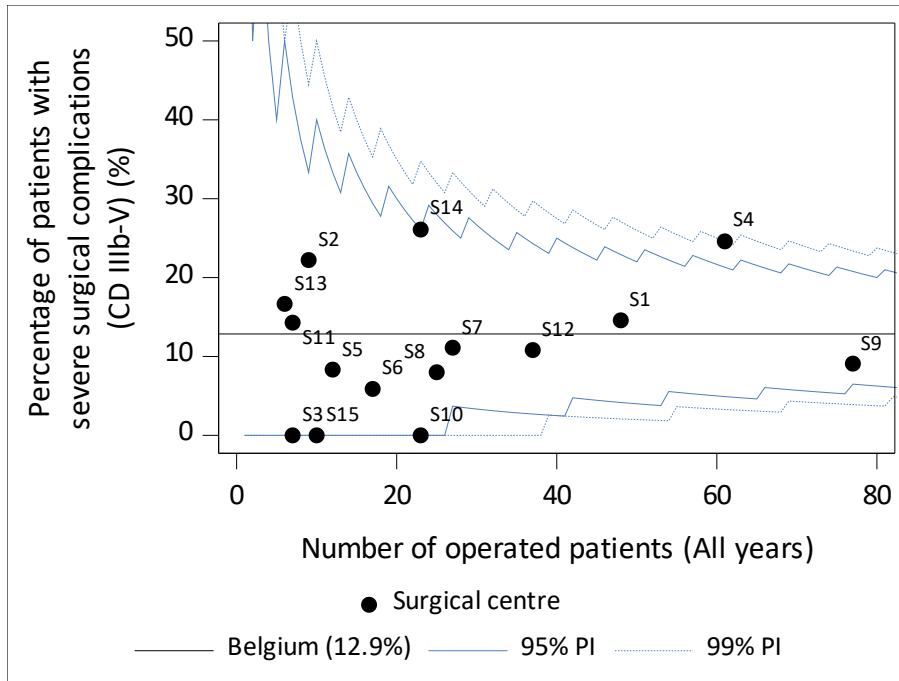
⁴ graded according to the International Study Group of Liver Surgery (ISGLS)

More information can be found in the project manual.

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

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

(a)



(b)

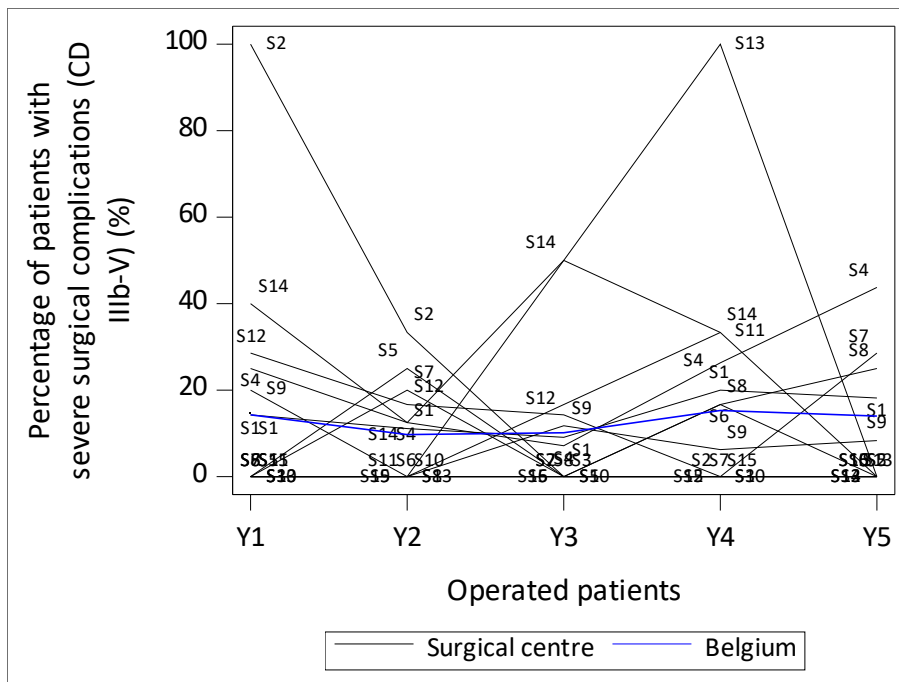
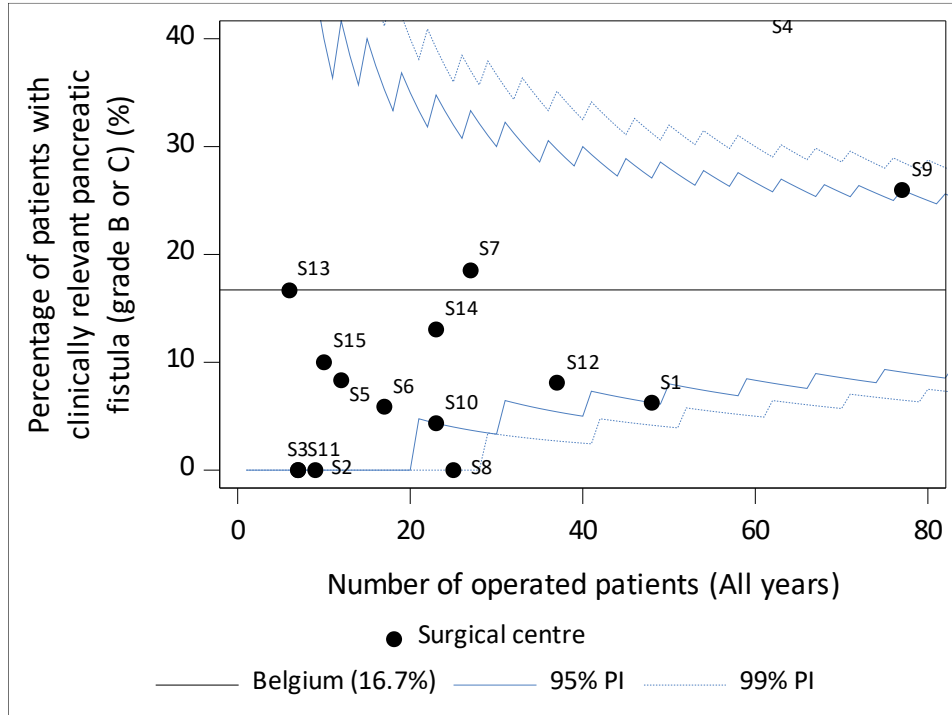


Figure 42: Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

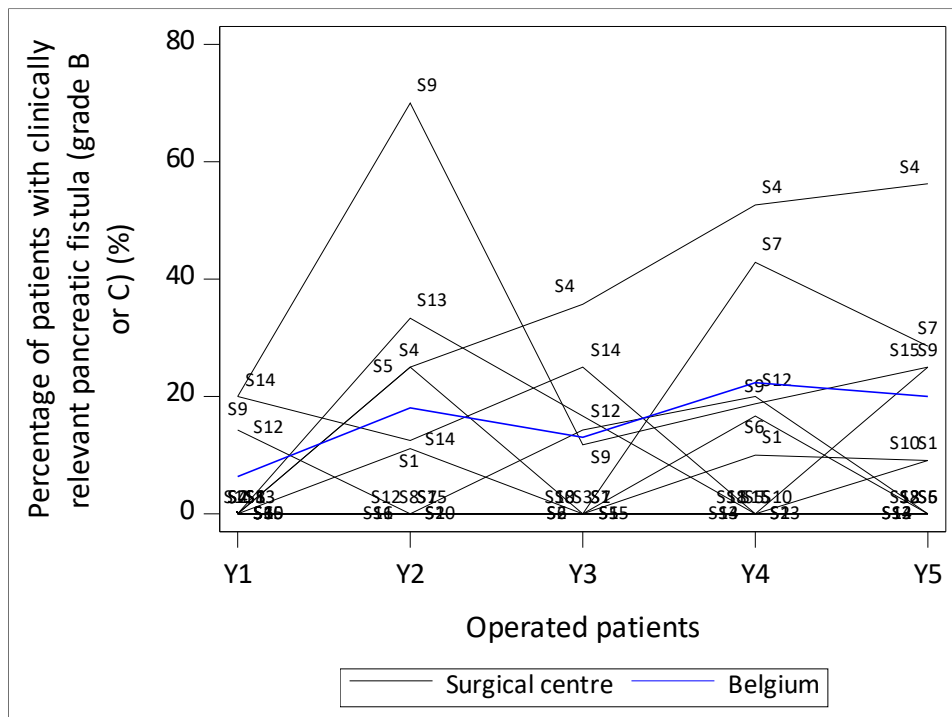
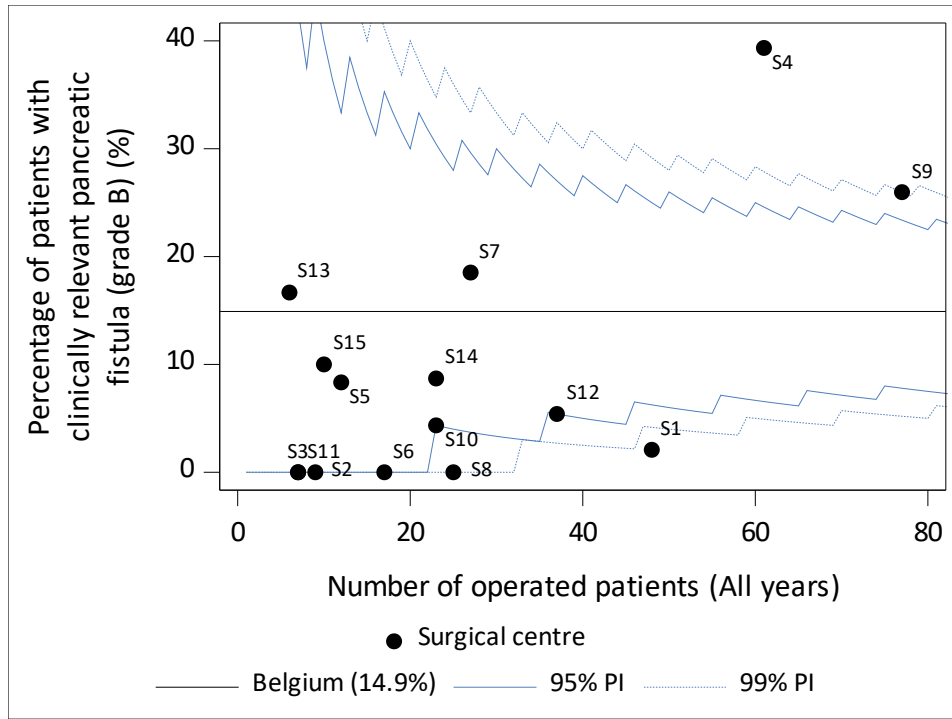


Figure 43: Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

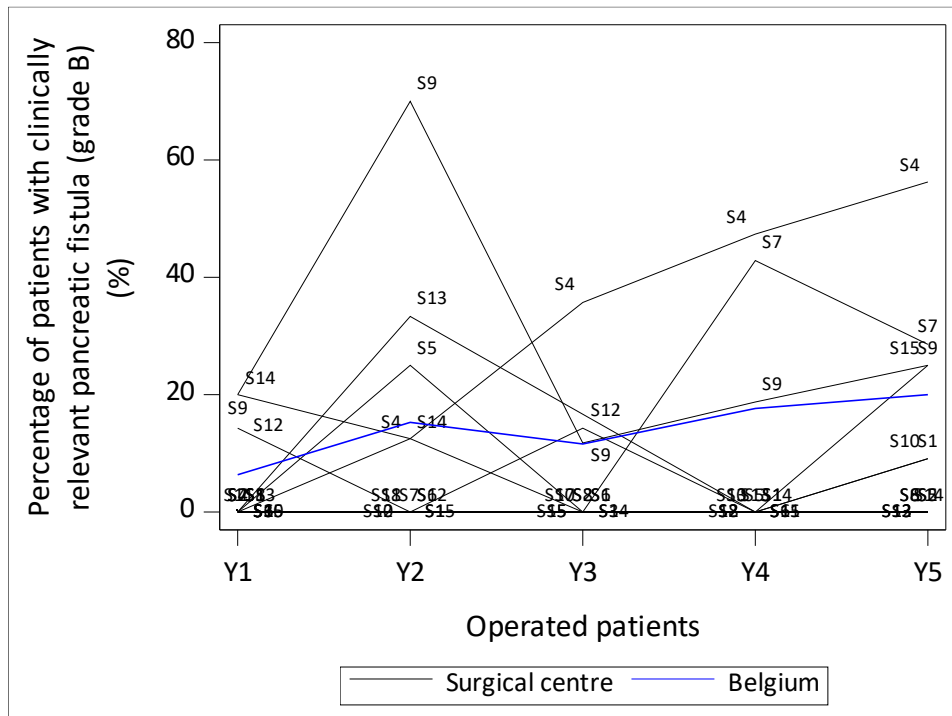
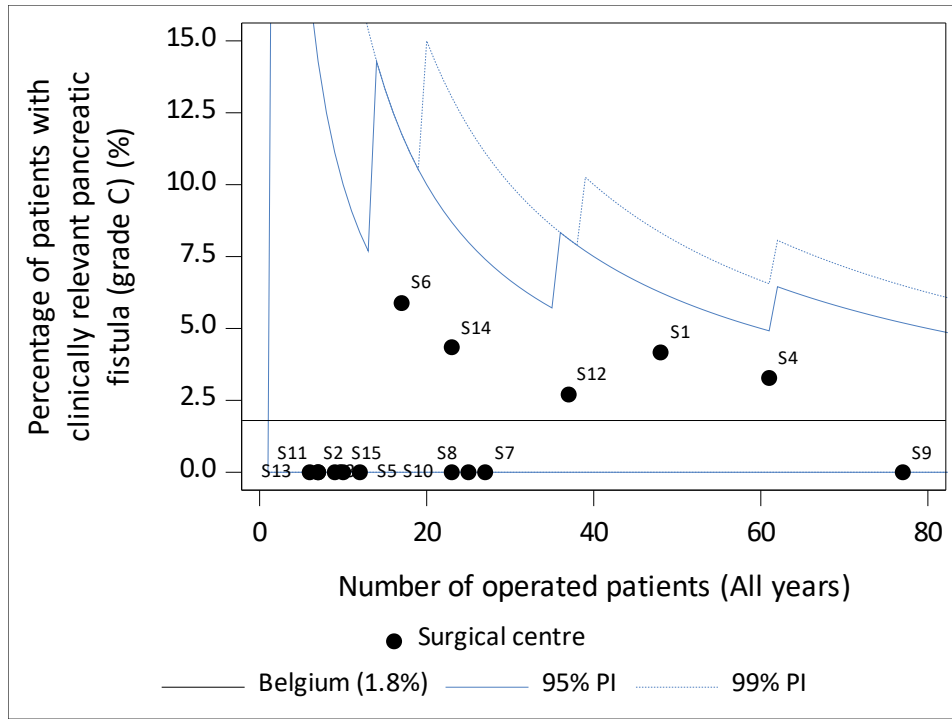


Figure 44: Funnel and spaghetti plot of operated patients with **clinically relevant pancreatic fistula (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

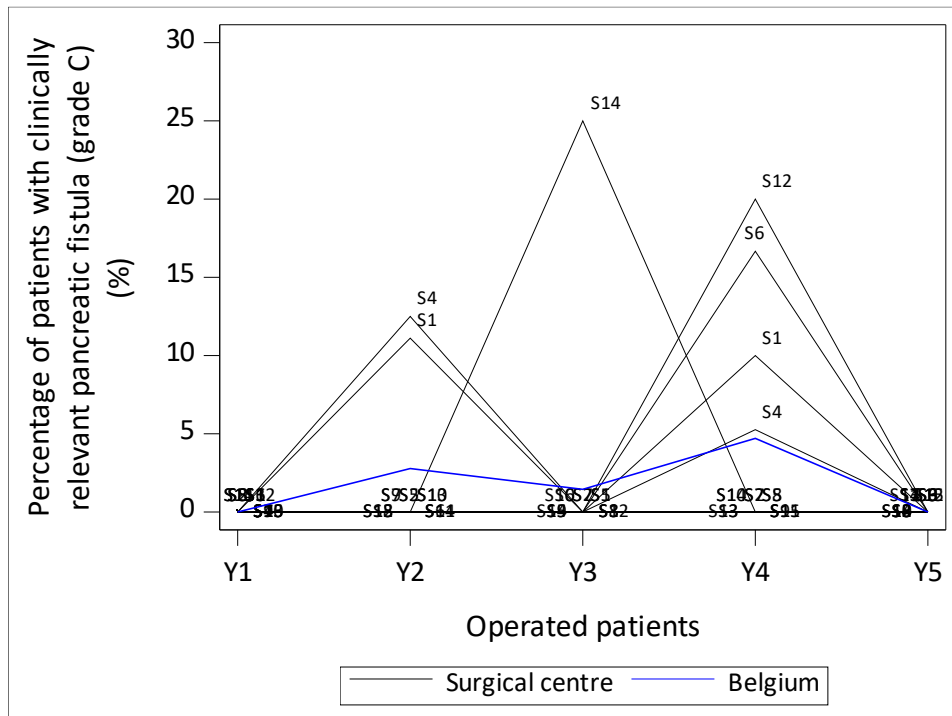
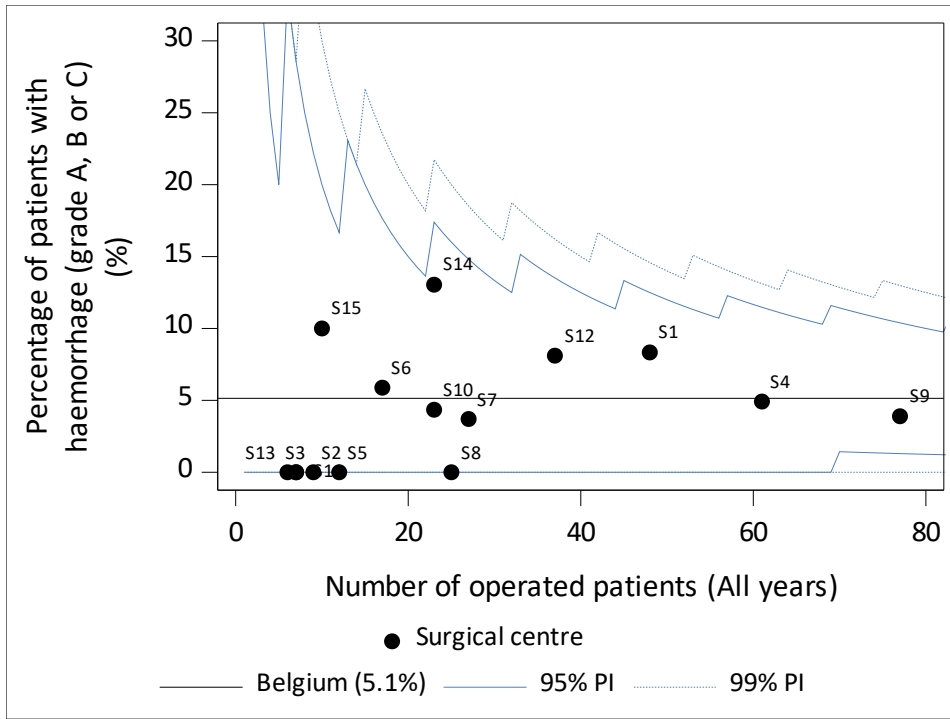


Figure 45: Funnel and spaghetti plot of operated patients with **haemorrhage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

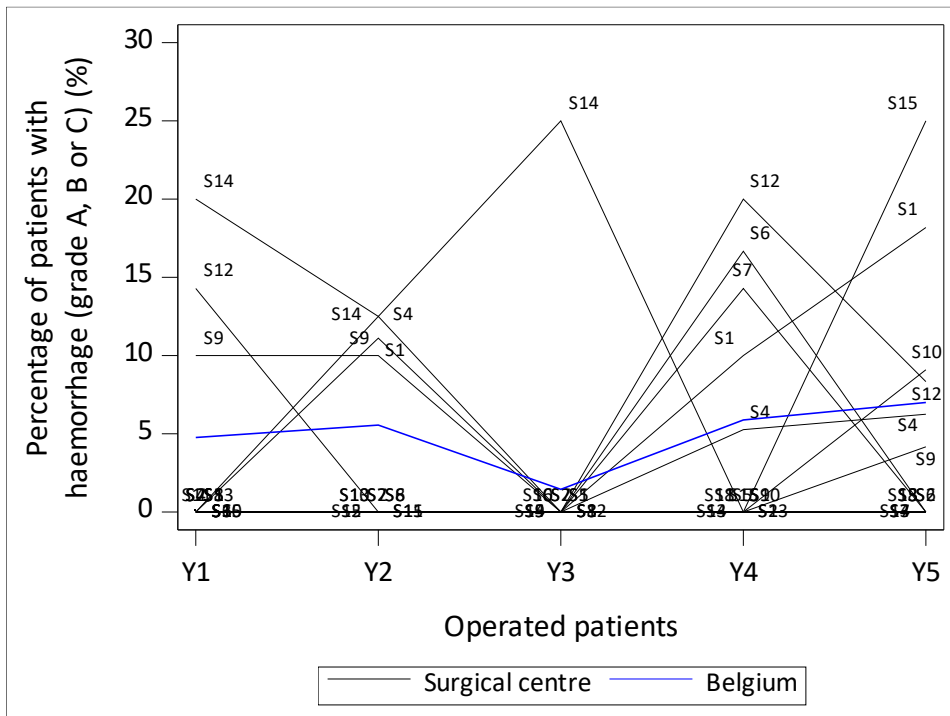
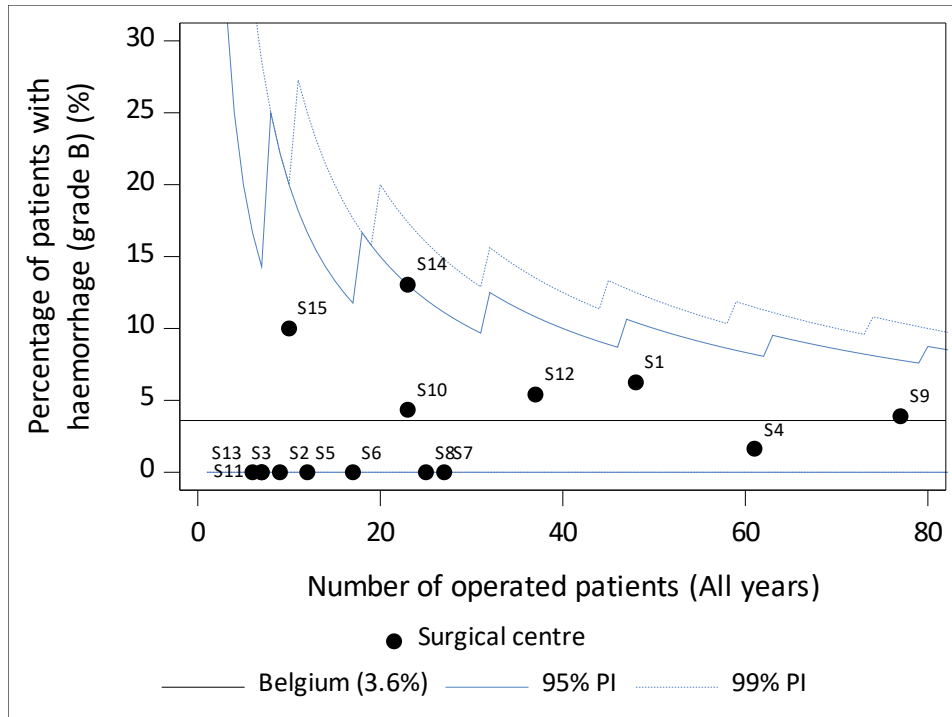


Figure 46: Funnel and spaghetti plot of operated patients with **haemorrhage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

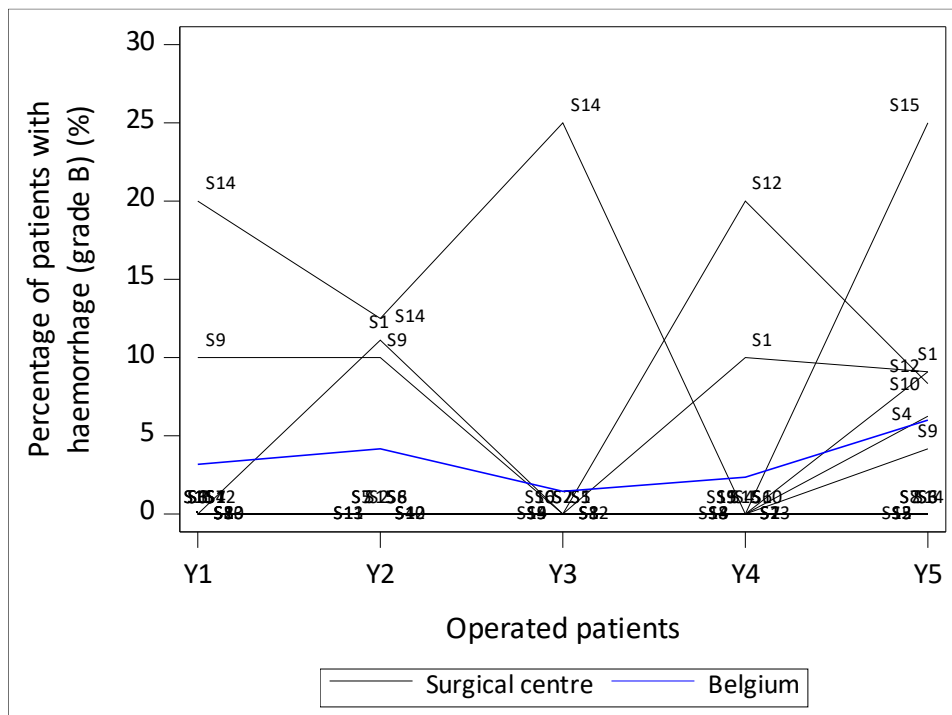
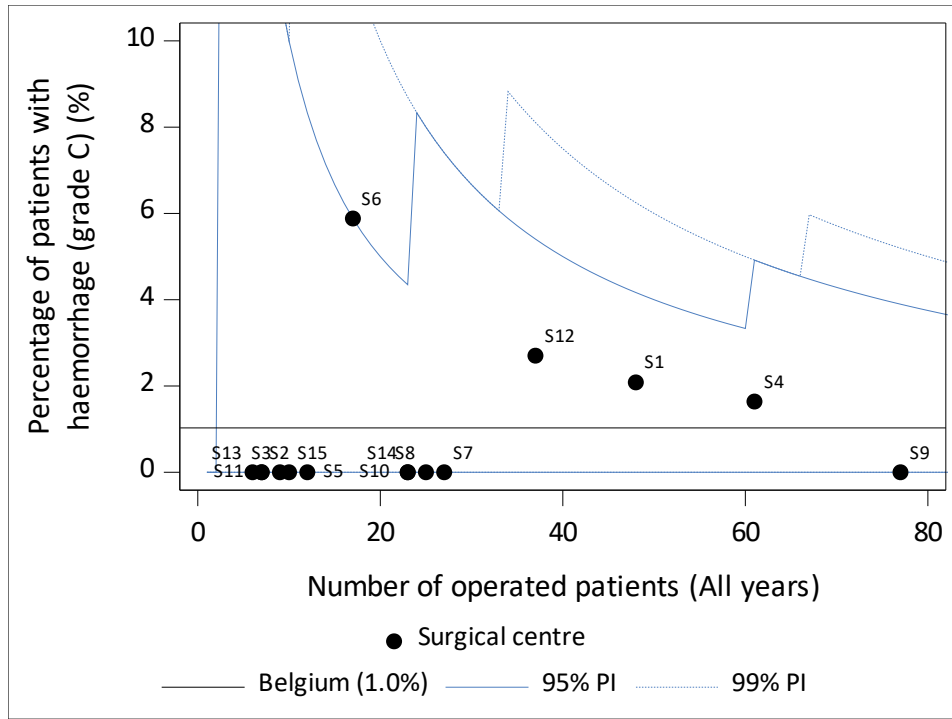


Figure 47: Funnel and spaghetti plot of operated patients with **haemorrhage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

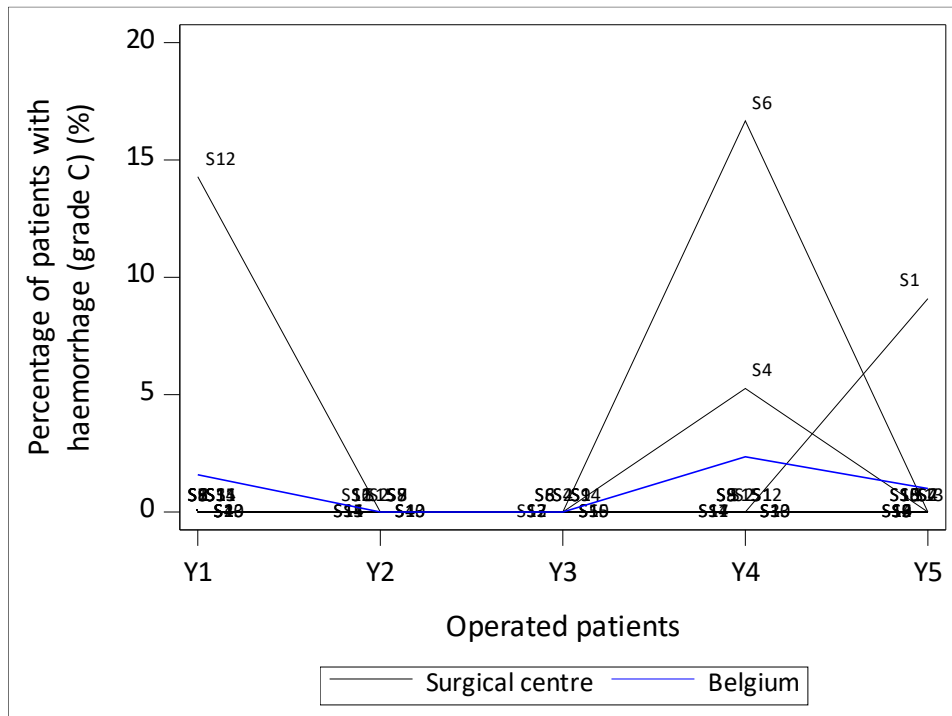
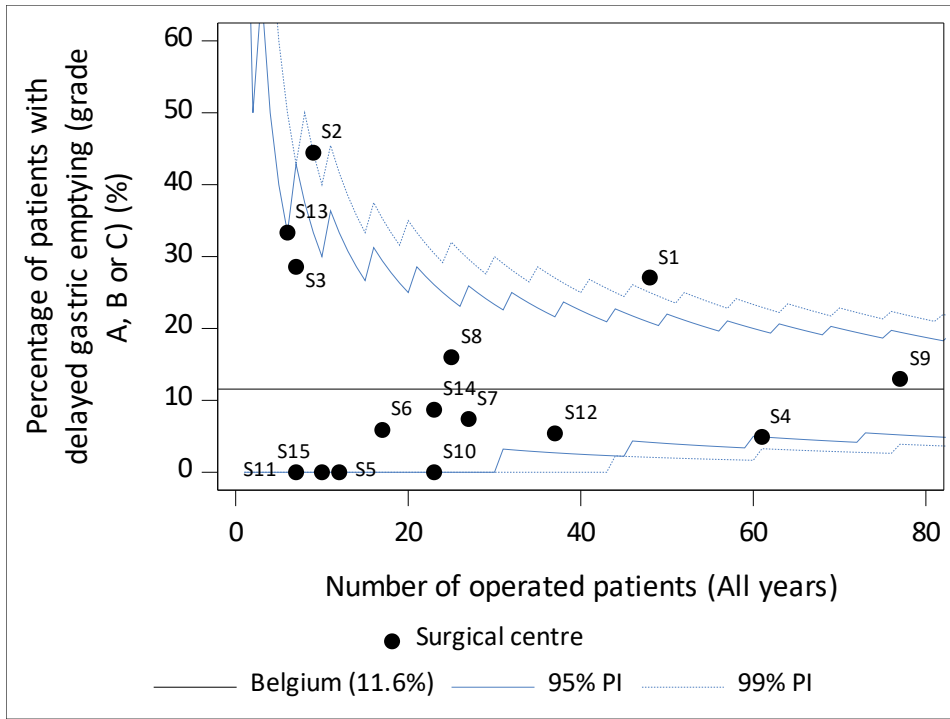


Figure 48: Funnel and spaghetti plot of operated patients with **delayed gastric emptying (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

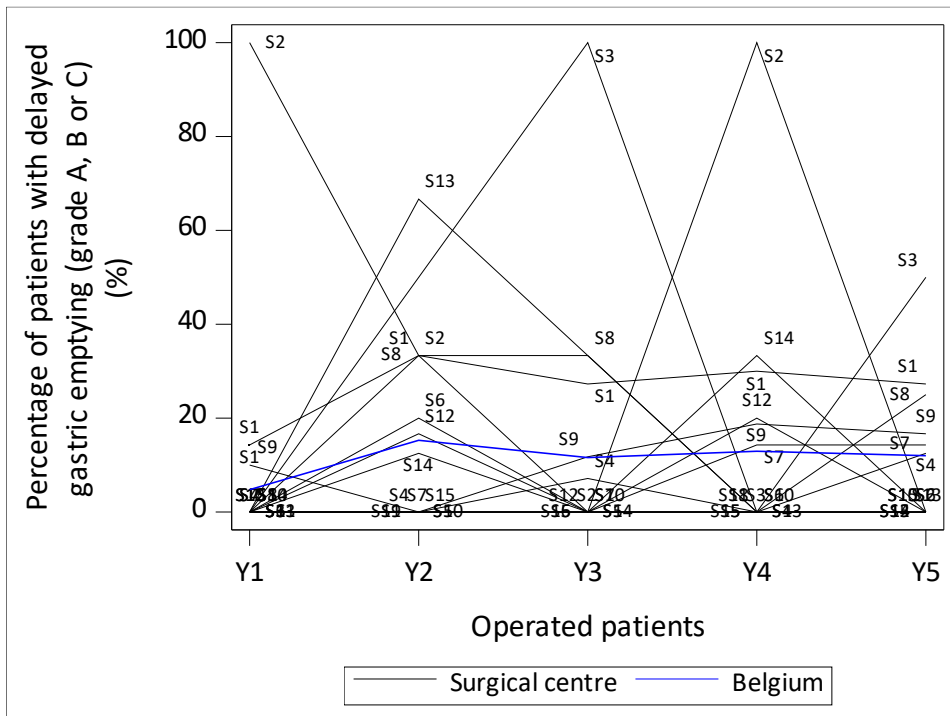
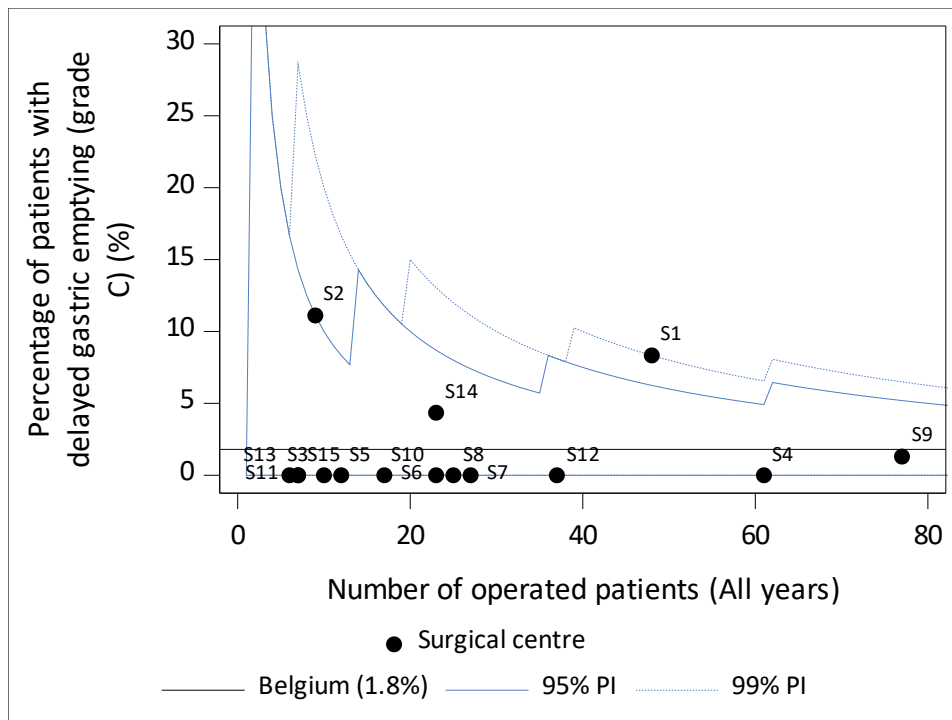


Figure 50: Funnel and spaghetti plot of operated patients with **delayed gastric emptying (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

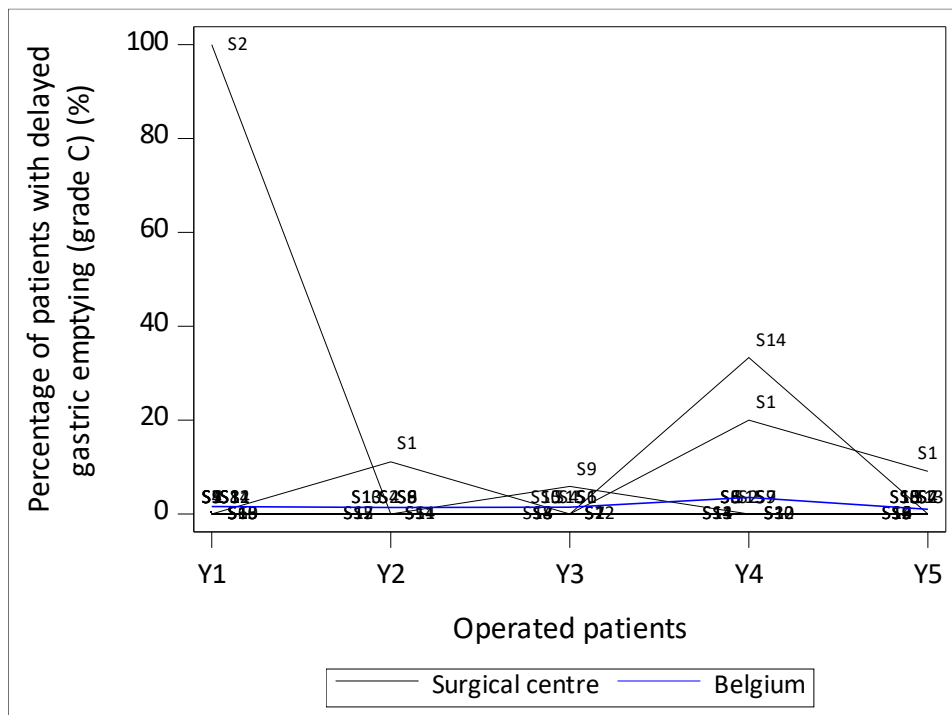
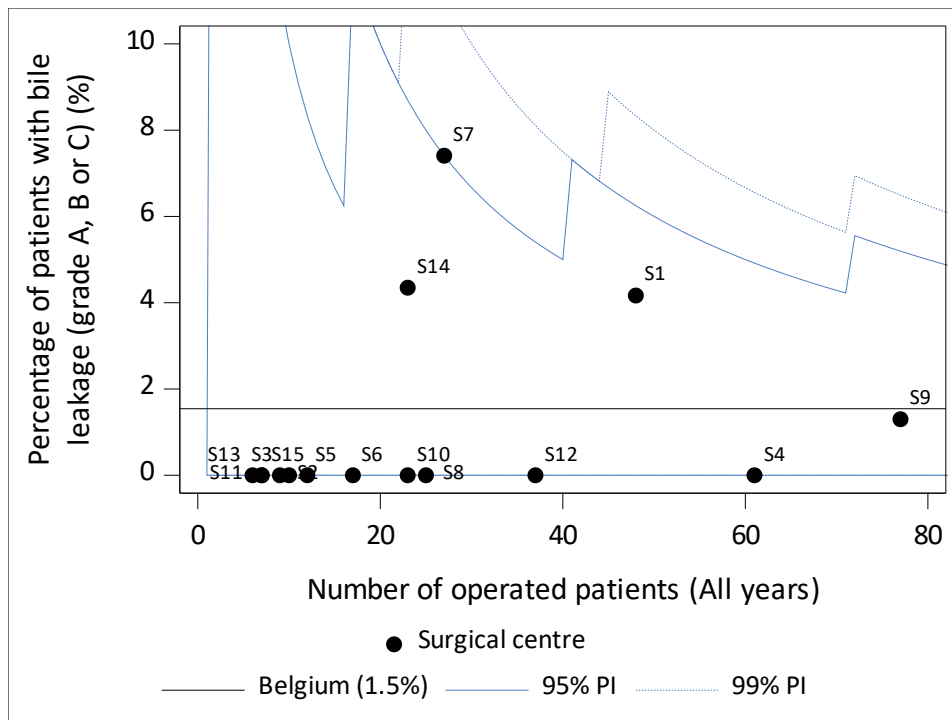


Figure 51: Funnel and spaghetti plot of operated patients with **bile leakage (grade A, B or C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

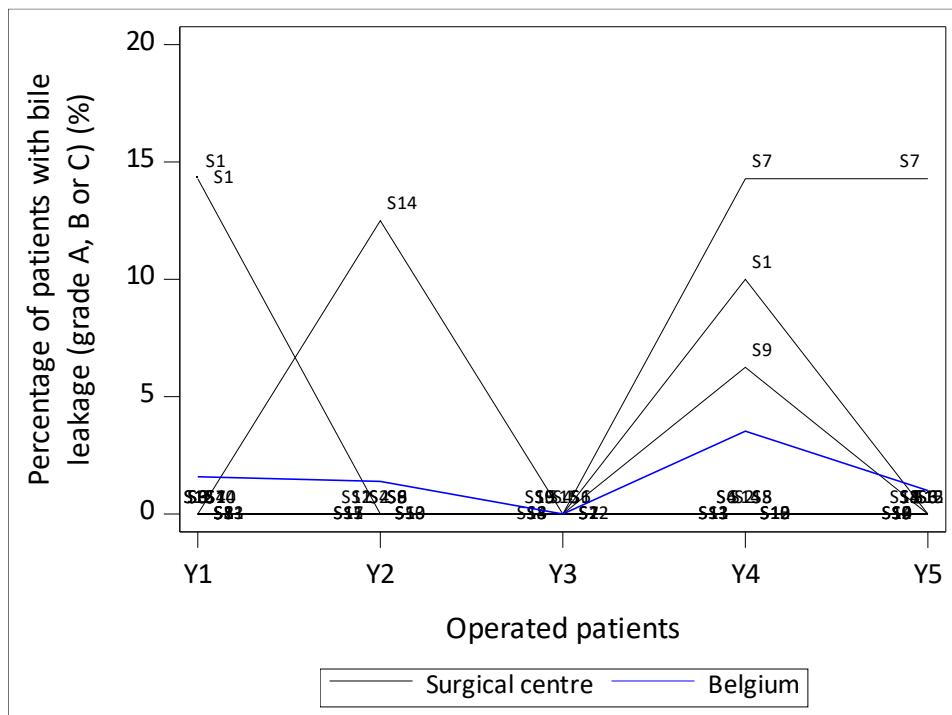
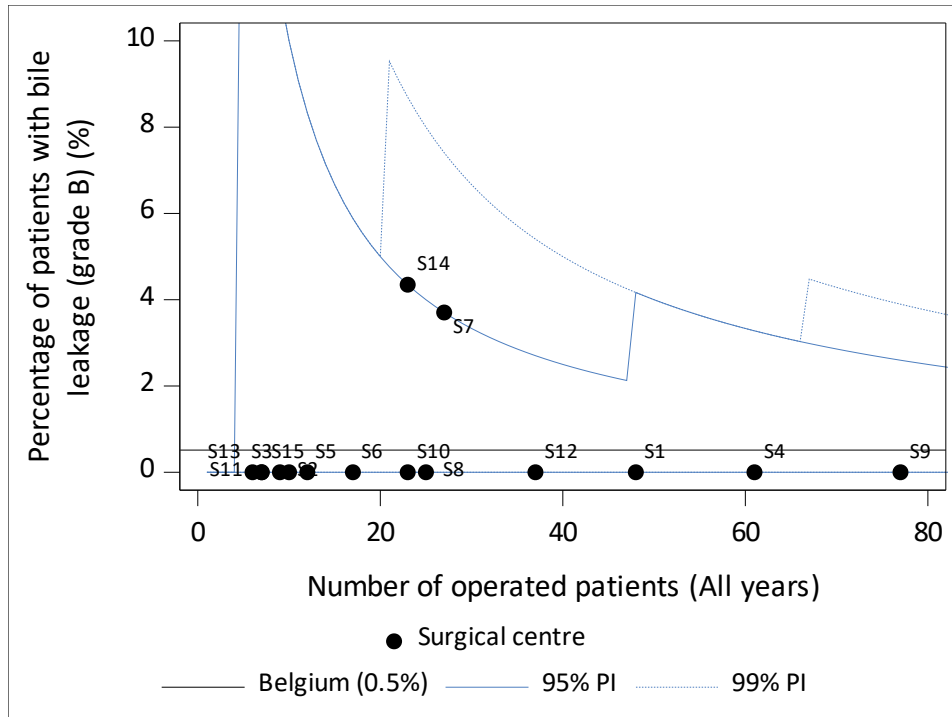


Figure 52: Funnel and spaghetti plot of operated patients with **bile leakage (grade B, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

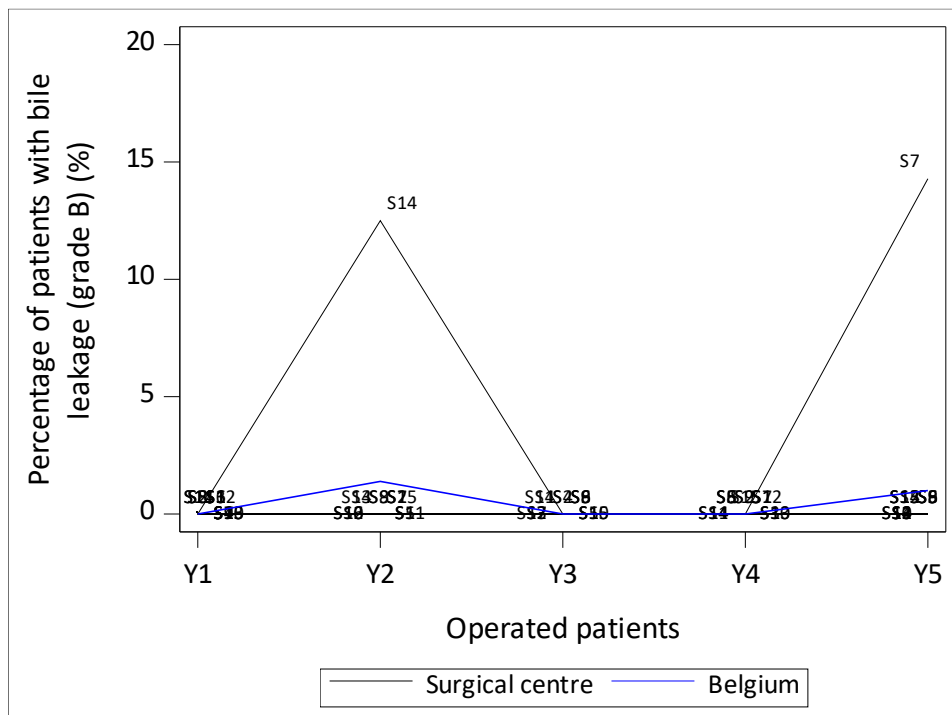
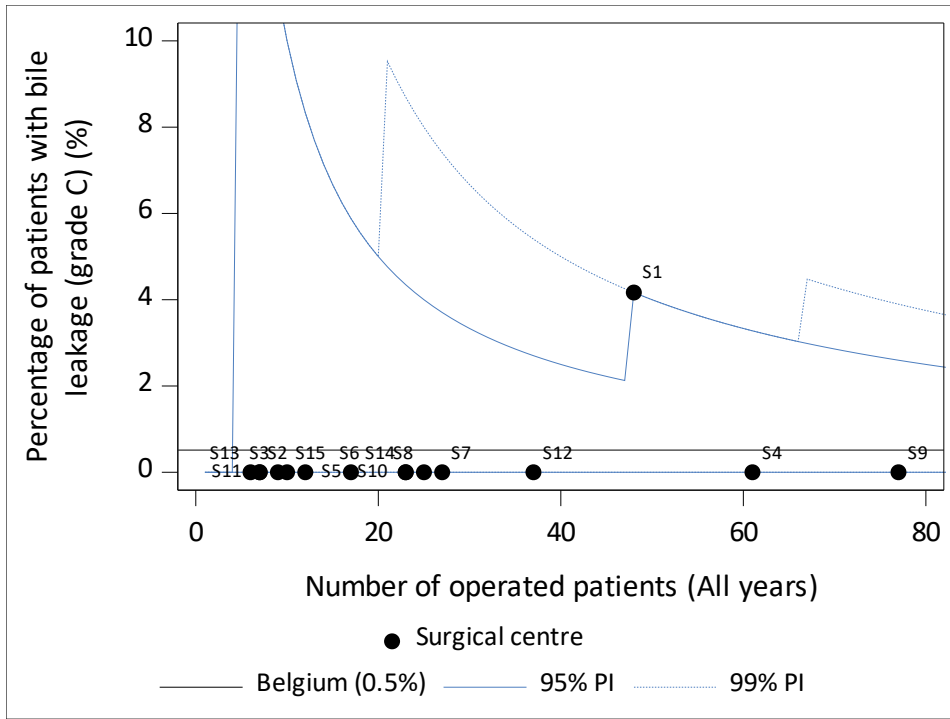


Figure 53: Funnel and spaghetti plot of operated patients with **bile leakage (grade C, within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)

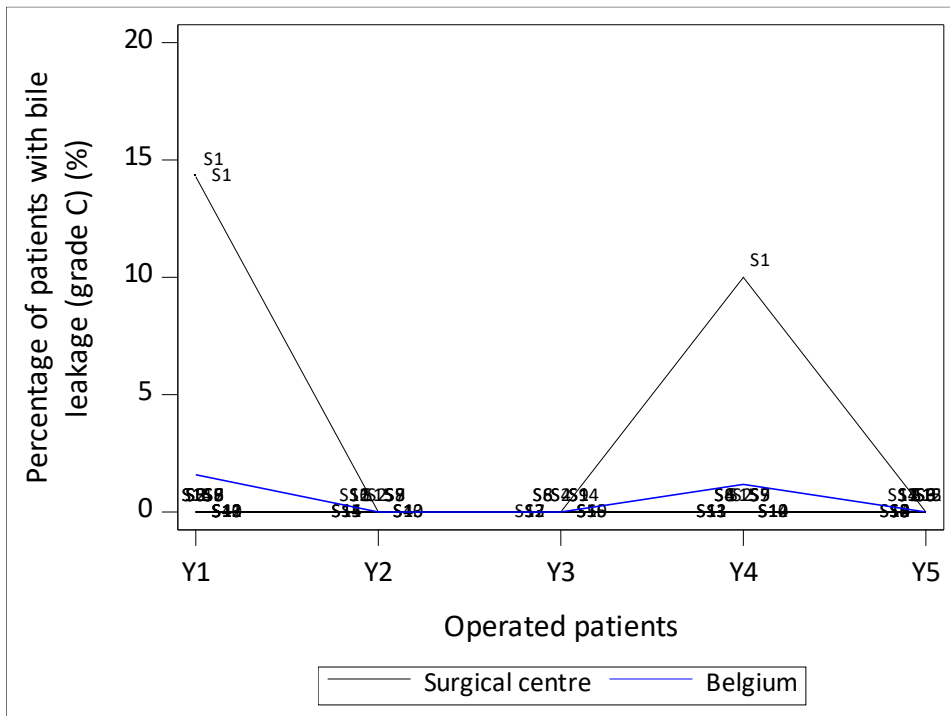
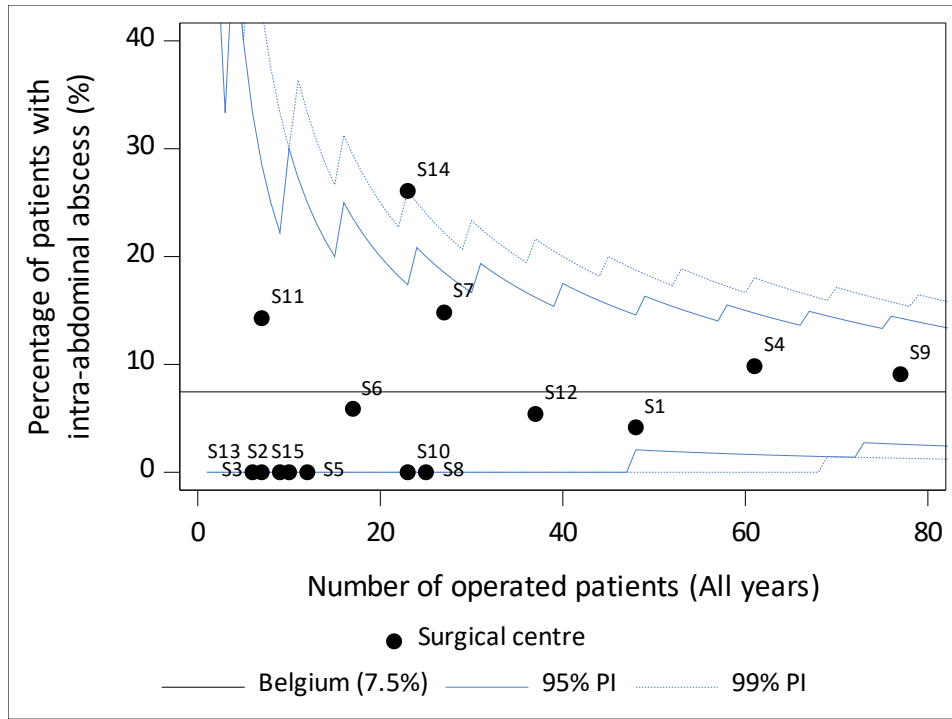
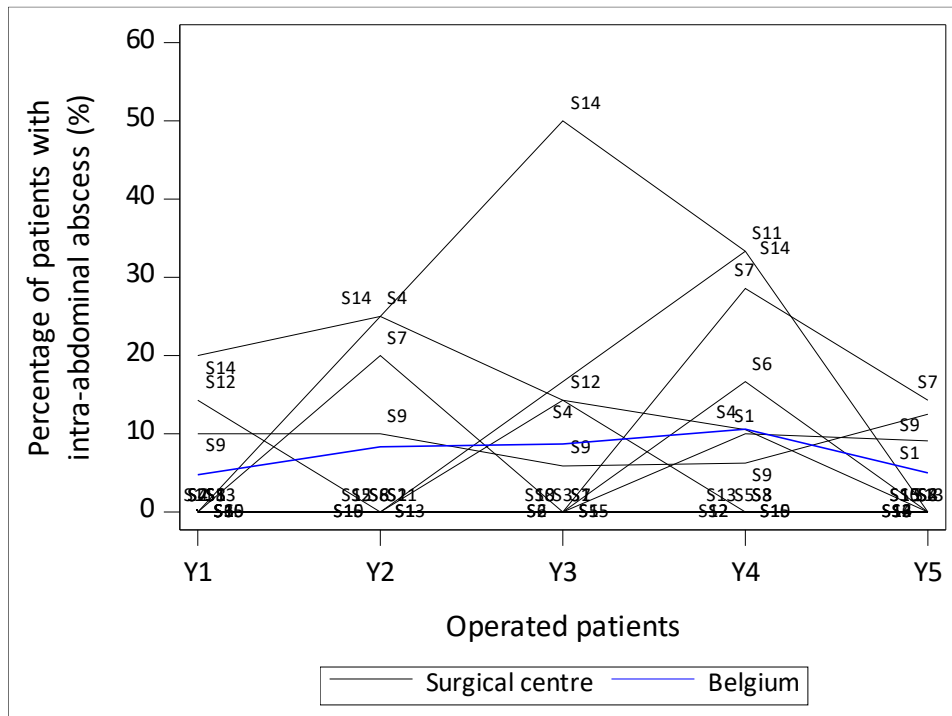


Figure 54: Funnel and spaghetti plot of operated patients with **intra-abdominal abscess (within 90 days)**, per centre, for (a) all years combined, (b) evolution year 1, 2, 3, 4 and 5.

(a)



(b)



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

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

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|---|---|-----------|-------------|--------------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| Operated patients with non-tumoural pathology | 389 | 50 | 12.9 | [9.7, 16.6] |
| Expert centres | | | | . |
| S1 | 48 | 7 | 14.6 | [6.1, 27.8] |
| S2 | 9 | 2 | 22.2 | [2.8, 60.0] |
| S3 | 7 | 0 | 0.0 | [0.0, 41.0] |
| S4 | 61 | 15 | 24.6 | [14.5, 37.3] |
| S5 | 12 | 1 | 8.3 | [0.2, 38.5] |
| S6 | 17 | 1 | 5.9 | [0.1, 28.7] |
| S7 | 27 | 3 | 11.1 | [2.4, 29.2] |
| S8 | 25 | 2 | 8.0 | [1.0, 26.0] |
| S9 | 77 | 7 | 9.1 | [3.7, 17.8] |
| S10 | 23 | 0 | 0.0 | [0.0, 14.8] |
| S11 | 7 | 1 | 14.3 | [0.4, 57.9] |
| S12 | 37 | 4 | 10.8 | [3.0, 25.4] |
| S13 | 6 | 1 | 16.7 | [0.4, 64.1] |
| S14 | 23 | 6 | 26.1 | [10.2, 48.4] |
| S15 | 10 | 0 | 0.0 | [0.0, 30.8] |
| Convention year | | | | |
| Year 1 | 63 | 9 | 14.3 | [6.7, 25.4] |
| Year 2 | 72 | 7 | 9.7 | [4.0, 19.0] |
| Year 3 | 69 | 7 | 10.1 | [4.2, 19.8] |
| Year 4 | 85 | 13 | 15.3 | [8.4, 24.7] |
| Year 5 | 100 | 14 | 14.0 | [7.9, 22.4] |
| Sex | | | | |
| Male | 267 | 35 | 13.1 | [9.3, 17.8] |
| Female | 122 | 15 | 12.3 | [7.0, 19.5] |
| Age at surgery | | | | |
| <=69 | 339 | 45 | 13.3 | [9.8, 17.4] |
| 70-79 | 42 | 3 | 7.1 | [1.5, 19.5] |
| >=80 | 8 | 2 | 25.0 | [3.2, 65.1] |
| Prior surgery or other treatment ** | | | | |
| Prior abdominal surgery | 80 | 12 | 15.0 | [8.0, 24.7] |
| Other treatment modality (that could affect the pancreas) | 78 | 14 | 17.9 | [10.2, 28.3] |

| Characteristic | Severe surgical complications (Clavien-Dindo IIIb-V) | | | |
|--|---|----|------------|--------------|
| | Belgium | | | |
| | N | n | n/N (%) | 95% CI |
| Charlson Comorbidity Index | | | | |
| 0 | 162 | 21 | 13.0 | [8.2, 19.1] |
| 1 | 97 | 8 | 8.2 | [3.6, 15.6] |
| 2 | 62 | 12 | 19.4 | [10.4, 31.4] |
| 3 | 36 | 5 | 13.9 | [4.7, 29.5] |
| 4 | 18 | 2 | 11.1 | [1.4, 34.7] |
| 5 | 6 | 1 | 16.7 | [0.4, 64.1] |
| 6 | 4 | 1 | 25.0 | [0.6, 80.6] |
| 8 | 1 | 0 | 0.0 | [0.0, 97.5] |
| 9 | 1 | 0 | 0.0 | [0.0, 97.5] |
| 10 | 1 | 0 | 0.0 | [0.0, 97.5] |
| 11 | 1 | 0 | 0.0 | [0.0, 97.5] |
| WHO score at surgery | | | | |
| 0 - Asymptomatic, normal activity | 102 | 13 | 12.7 | [7.0, 20.8] |
| 1 - Symptomatic, but ambulant | 238 | 30 | 12.6 | [8.7, 17.5] |
| 2 - Symptomatic, bedbound < 50% day | 37 | 3 | 8.1 | [1.7, 21.9] |
| 3 - Symptomatic, bedbound > 50% day | 7 | 0 | 0.0 | [0.0, 41.0] |
| 4 - Completely dependent, 100% bedbound | 5 | 4 | 80.0 | [28.4, 99.5] |
| ASA score | | | | |
| 1 - Healthy person | 22 | 0 | 0.0 | [0.0, 15.4] |
| 2 - Mild systemic disease, normal activity | 205 | 26 | 12.7 | [8.5, 18.0] |
| 3 - Serious systemic disease, limited activity | 154 | 21 | 13.6 | [8.6, 20.1] |
| 4 - Life-threatening illness, handicapped | 7 | 3 | 42.9 | [9.9, 81.6] |
| 5 - Dying | 1 | 0 | 0.0 | [0.0, 97.5] |
| Type of surgery | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 76 | 12 | 15.8 | [8.4, 26.0] |
| Minimally invasive surgery (MIS) - Hybrid | 2 | 0 | 0.0 | [0.0, 84.2] |
| Minimally invasive surgery (MIS) - Robotic | 47 | 6 | 12.8 | [4.8, 25.7] |
| Open | 241 | 28 | 11.6 | [7.9, 16.4] |
| Conversion from MIS to open surgery | 23 | 4 | 17.4 | [5.0, 38.8] |
| Simultaneous vascular resection | | | | |
| No vascular reconstruction | 370 | 47 | 12.7 | [9.5, 16.5] |
| Simultaneous superior mesenteric vein/portal vein (SMV/PV) resection | 16 | 3 | 18.8 | [4.0, 45.6] |
| Simultaneous arterial resection ** | 2 | 0 | 0.0 | [0.0, 84.2] |
| Missing | 1 | 0 | 0.0 | [0.0, 97.5] |
| Simultaneous other organ resection ** | | | | |
| No | 248 | 32 | 12.9 | [9.0, 17.7] |
| Colon | 15 | 4 | 26.7 | [7.8, 55.1] |
| Stomach | 44 | 9 | 20.5 | [9.8, 35.3] |

| Severe surgical complications (Clavien-Dindo IIIb-V) | | | | |
|---|-----|----|---------|--------------|
| Belgium | | | | |
| Characteristic | N | n | n/N (%) | 95% CI |
| Adrenal gland | 8 | 2 | 25.0 | [3.2, 65.1] |
| Spleen | 91 | 10 | 11.0 | [5.4, 19.3] |
| Other | 28 | 4 | 14.3 | [4.0, 32.7] |
| RIZIV code for complex surgery | | | | |
| 242830-242841: Pancreaticoduodenectomy | 216 | 30 | 13.9 | [9.6, 19.2] |
| Pancreaticoduodenectomy | 192 | 26 | 13.5 | [9.0, 19.2] |
| Total Pancreatectomy | 24 | 4 | 16.7 | [4.7, 37.4] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 67 | 6 | 9.0 | [3.4, 18.5] |
| 242874-242885: Hemipancreatectomy left | 101 | 14 | 13.9 | [7.8, 22.2] |
| 242896-242900: Enucleation of a pancreatic tumour | 5 | 0 | 0.0 | [0.0, 52.2] |
| Antithrombotic medication | | | | |
| No | 301 | 43 | 14.3 | [10.5, 18.8] |
| Yes | 88 | 7 | 8.0 | [3.3, 15.7] |
| Was the patient referred? | | | | |
| No | 242 | 34 | 14.0 | [9.9, 19.1] |
| Yes | 147 | 16 | 10.9 | [6.4, 17.1] |

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

5. Total operated population

5.1. Case mix description for the total operated population

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

| Characteristic | Belgium | | | | | | | | | |
|---|------------|------|------------|------|------------|------|------------|------|--------------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| <i>Patients with surgery</i> | 787 | | 928 | | 920 | | 919 | | 1,011 | |
| <i>Morphology</i> | | | | | | | | | | |
| Adenocarcinoma | 476 | 60.5 | 554 | 59.7 | 552 | 60.0 | 545 | 59.3 | 579 | 57.3 |
| Neuroendocrine tumour | 67 | 8.5 | 114 | 12.3 | 123 | 13.4 | 102 | 11.1 | 129 | 12.8 |
| Benign tumour | 126 | 16.0 | 135 | 14.5 | 112 | 12.2 | 118 | 12.8 | 112 | 11.1 |
| Other or unspecified | 118 | 15.0 | 125 | 13.5 | 133 | 14.5 | 154 | 16.8 | 191 | 18.9 |
| <i>Type of surgery</i> | | | | | | | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 207 | 26.3 | 270 | 29.1 | 293 | 31.8 | 234 | 25.5 | 233 | 23.0 |
| Minimally invasive surgery (MIS) - Hybrid | 1 | 0.1 | 3 | 0.3 | 2 | 0.2 | 1 | 0.1 | 0 | 0.0 |
| Minimally invasive surgery (MIS) - Robotic | 21 | 2.7 | 78 | 8.4 | 91 | 9.9 | 128 | 13.9 | 217 | 21.5 |
| Open | 532 | 67.6 | 530 | 57.1 | 483 | 52.5 | 511 | 55.6 | 516 | 51.0 |
| Conversion from MIS to open surgery | 26 | 3.3 | 47 | 5.1 | 51 | 5.5 | 45 | 4.9 | 45 | 4.5 |
| <i>RIZIV code for complex surgery</i> | | | | | | | | | | |
| 242830-242841: Pancreaticoduodenectomy | 563 | 71.5 | 601 | 64.8 | 597 | 64.9 | 597 | 65.0 | 620 | 61.3 |
| Pancreaticoduodenectomy | 512 | 90.9 | 548 | 91.2 | 548 | 91.8 | 533 | 89.3 | 550 | 88.7 |
| Total Pancreatectomy | 51 | 9.1 | 53 | 8.8 | 49 | 8.2 | 64 | 10.7 | 70 | 11.3 |

| Characteristic | Belgium | | | | | | | | | |
|---|---------|------|--------|------|--------|------|--------|------|--------|------|
| | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | N | % | N | % | N | % | N | % | N | % |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 63 | 8.0 | 104 | 11.2 | 88 | 9.6 | 122 | 13.3 | 90 | 8.9 |
| 242874-242885: Hemipancreatectomy left | 150 | 19.1 | 208 | 22.4 | 217 | 23.6 | 191 | 20.8 | 285 | 28.2 |
| 242896-242900: Enucleation of a pancreatic tumour | 11 | 1.4 | 15 | 1.6 | 18 | 2.0 | 9 | 1.0 | 16 | 1.6 |

5.2. Postoperative mortality for the total operated population

5.2.1. Unadjusted 30-day postoperative mortality

Table 36. Unadjusted 30-day postoperative mortality for the **total operated** population in the five convention years, by patient and tumour characteristics.

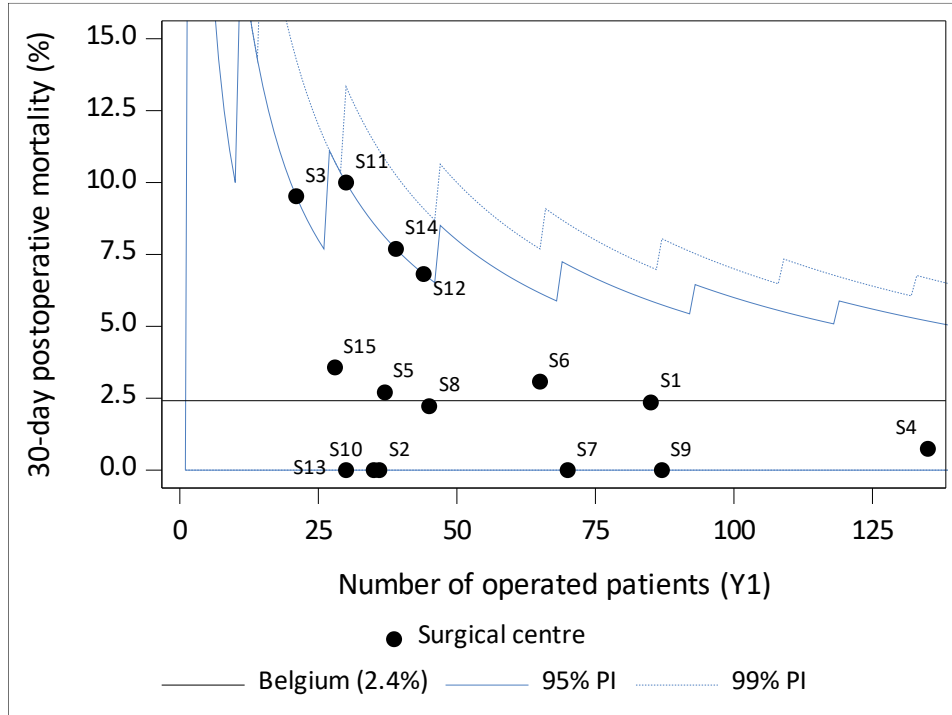
| Unadjusted 30-day postoperative mortality | | | | |
|---|--------------|-------------|------------|-------------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| Patients with surgery | 4,565 | 90 | 2.0 | [1.6, 2.4] |
| Expert centres | | | | . |
| S1 | 459 | 11 | 2.4 | [1.2, 4.2] |
| S2 | 187 | 3 | 1.6 | [0.3, 4.6] |
| S3 | 125 | 5 | 4.0 | [1.3, 9.1] |
| S4 | 796 | 14 | 1.8 | [1.0, 2.9] |
| S5 | 195 | 7 | 3.6 | [1.5, 7.3] |
| S6 | 430 | 12 | 2.8 | [1.5, 4.8] |
| S7 | 347 | 1 | 0.3 | [0.0, 1.6] |
| S8 | 264 | 4 | 1.5 | [0.4, 3.8] |
| S9 | 526 | 6 | 1.1 | [0.4, 2.5] |
| S10 | 165 | 1 | 0.6 | [0.0, 3.3] |
| S11 | 183 | 8 | 4.4 | [1.9, 8.4] |
| S12 | 256 | 4 | 1.6 | [0.4, 4.0] |
| S13 | 198 | 5 | 2.5 | [0.8, 5.8] |
| S14 | 283 | 7 | 2.5 | [1.0, 5.0] |
| S15 | 151 | 2 | 1.3 | [0.2, 4.7] |
| Convention year | | | | |
| Year 1 | 787 | 19 | 2.4 | [1.5, 3.7] |
| Year 2 | 928 | 20 | 2.2 | [1.3, 3.3] |
| Year 3 | 920 | 22 | 2.4 | [1.5, 3.6] |
| Year 4 | 919 | 14 | 1.5 | [0.8, 2.5] |
| Year 5 | 1,011 | 15 | 1.5 | [0.8, 2.4] |
| Sex | | | | |
| Male | 2,516 | 57 | 2.3 | [1.7, 2.9] |
| Female | 2,049 | 33 | 1.6 | [1.1, 2.3] |
| Age at surgery | | | | |
| <=69 | 2,685 | 35 | 1.3 | [0.9, 1.8] |
| 70-79 | 1,490 | 38 | 2.6 | [1.8, 3.5] |
| >=80 | 390 | 17 | 4.4 | [2.6, 6.9] |
| Lesion to treat (in (peri-)pancreas) | | | | |

| Unadjusted 30-day postoperative mortality | | | | |
|---|-------|-------------|------|-------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| Primary tumour | 4,453 | 87 | 2.0 | [1.6, 2.4] |
| Relapse of primary tumour | 54 | 2 | 3.7 | [0.5, 12.7] |
| Metastasis | 58 | 1 | 1.7 | [0.0, 9.2] |
| Morphology | | | | |
| Adenocarcinoma | 2,706 | 68 | 2.5 | [2.0, 3.2] |
| Neuroendocrine tumour | 535 | 5 | 0.9 | [0.3, 2.2] |
| Benign tumour | 603 | 6 | 1.0 | [0.4, 2.2] |
| Other or unspecified | 721 | 11 | 1.5 | [0.8, 2.7] |
| Charlson Comorbidity Index | | | | |
| 0 | 1,891 | 13 | 0.7 | [0.4, 1.2] |
| 1 | 1,102 | 32 | 2.9 | [2.0, 4.1] |
| 2 | 731 | 23 | 3.1 | [2.0, 4.7] |
| 3 | 379 | 10 | 2.6 | [1.3, 4.8] |
| 4 | 223 | 4 | 1.8 | [0.5, 4.5] |
| 5 | 92 | 3 | 3.3 | [0.7, 9.2] |
| 6 | 65 | 3 | 4.6 | [1.0, 12.9] |
| 7 | 37 | 1 | 2.7 | [0.1, 14.2] |
| 8 | 24 | 0 | 0.0 | [0.0, 14.2] |
| 9 | 11 | 1 | 9.1 | [0.2, 41.3] |
| 10 | 6 | 0 | 0.0 | [0.0, 45.9] |
| 11 | 2 | 0 | 0.0 | [0.0, 84.2] |
| 12 | 2 | 0 | 0.0 | [0.0, 84.2] |
| WHO score at surgery | | | | |
| 0 - Asymptomatic, normal activity | 1,347 | 16 | 1.2 | [0.7, 1.9] |
| 1 - Symptomatic, but ambulant | 2,726 | 55 | 2.0 | [1.5, 2.6] |
| 2 - Symptomatic, bedbound < 50% day | 417 | 14 | 3.4 | [1.8, 5.6] |
| 3 - Symptomatic, bedbound > 50% day | 68 | 3 | 4.4 | [0.9, 12.4] |
| 4 - Completely dependent, 100% bedbound | 7 | 2 | 28.6 | [3.7, 71.0] |
| ASA score | | | | |
| 1 - Healthy person | 291 | 3 | 1.0 | [0.2, 3.0] |
| 2 - Mild systemic disease, normal activity | 2,394 | 36 | 1.5 | [1.1, 2.1] |
| 3 - Serious systemic disease, limited activity | 1,824 | 48 | 2.6 | [1.9, 3.5] |
| 4 - Life-threatening illness, handicapped | 55 | 3 | 5.5 | [1.1, 15.1] |
| 5 - Dying | 1 | 0 | 0.0 | [0.0, 97.5] |
| Type of surgery | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 1,237 | 14 | 1.1 | [0.6, 1.9] |
| Minimally invasive surgery (MIS) - Hybrid | 7 | 0 | 0.0 | [0.0, 41.0] |
| Minimally invasive surgery (MIS) - Robotic | 535 | 8 | 1.5 | [0.6, 2.9] |
| Open | 2,572 | 57 | 2.2 | [1.7, 2.9] |
| Conversion from MIS to open surgery | 214 | 11 | 5.1 | [2.6, 9.0] |
| RIZIV code for complex surgery | | | | |

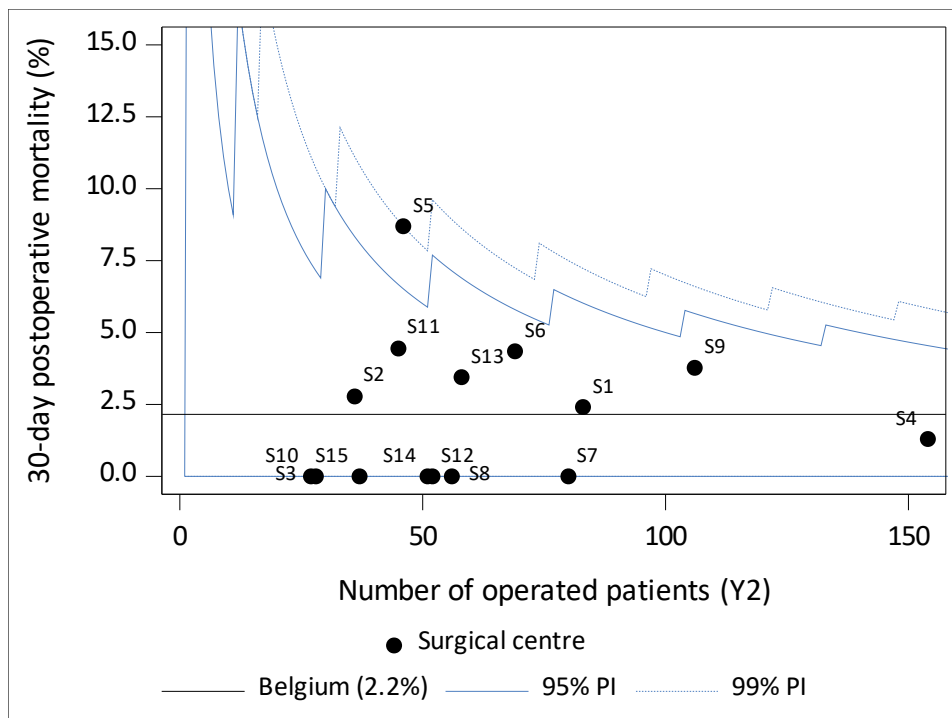
| Unadjusted 30-day postoperative mortality | | | | |
|---|-------|-------------|-----|------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| 242830-242841: Pancreaticoduodenectomy | 2,978 | 77 | 2.6 | [2.0, 3.2] |
| Pancreaticoduodenectomy | 2,691 | 71 | 2.6 | [2.1, 3.3] |
| Total Pancreatectomy | 287 | 6 | 2.1 | [0.8, 4.5] |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 467 | 5 | 1.1 | [0.3, 2.5] |
| 242874-242885: Hemipancreatectomy left | 1,051 | 7 | 0.7 | [0.3, 1.4] |
| 242896-242900: Enucleation of a pancreatic tumour | 69 | 1 | 1.4 | [0.0, 7.8] |
| <i>Antithrombotic medication</i> | | | | |
| No | 3,246 | 48 | 1.5 | [1.1, 2.0] |
| Yes | 1,319 | 42 | 3.2 | [2.3, 4.3] |
| <i>Was the patient referred?</i> | | | | |
| No | 2,128 | 40 | 1.9 | [1.3, 2.6] |
| Yes | 2,437 | 50 | 2.1 | [1.5, 2.7] |

Figure 55: Funnel and spaghetti plot of the unadjusted 30-day postoperative mortality for the total operated population, in the five convention years, 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.

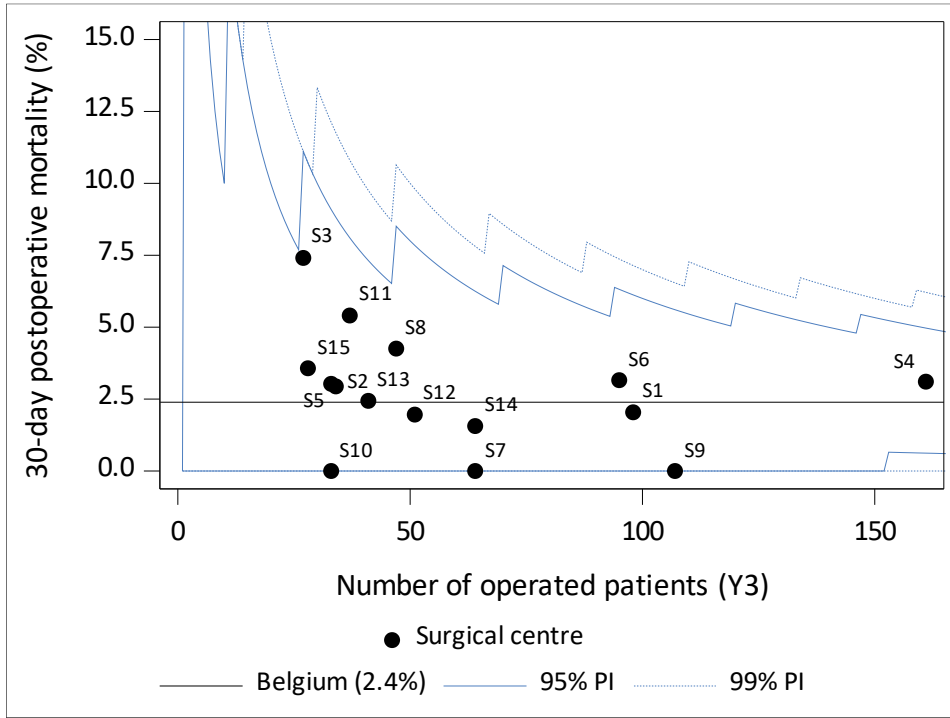
(a)



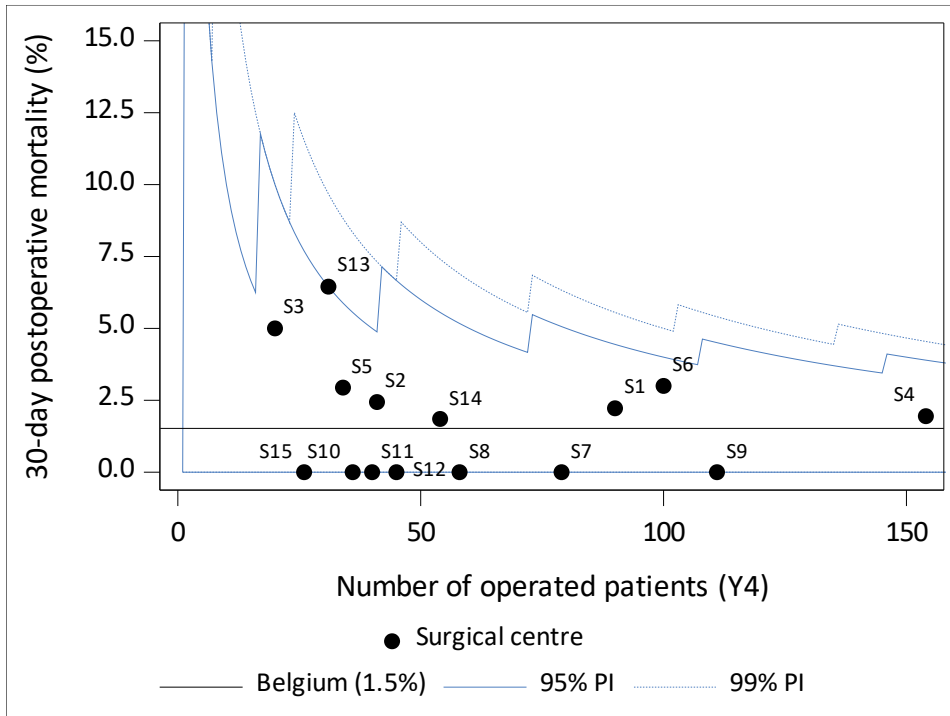
(b)



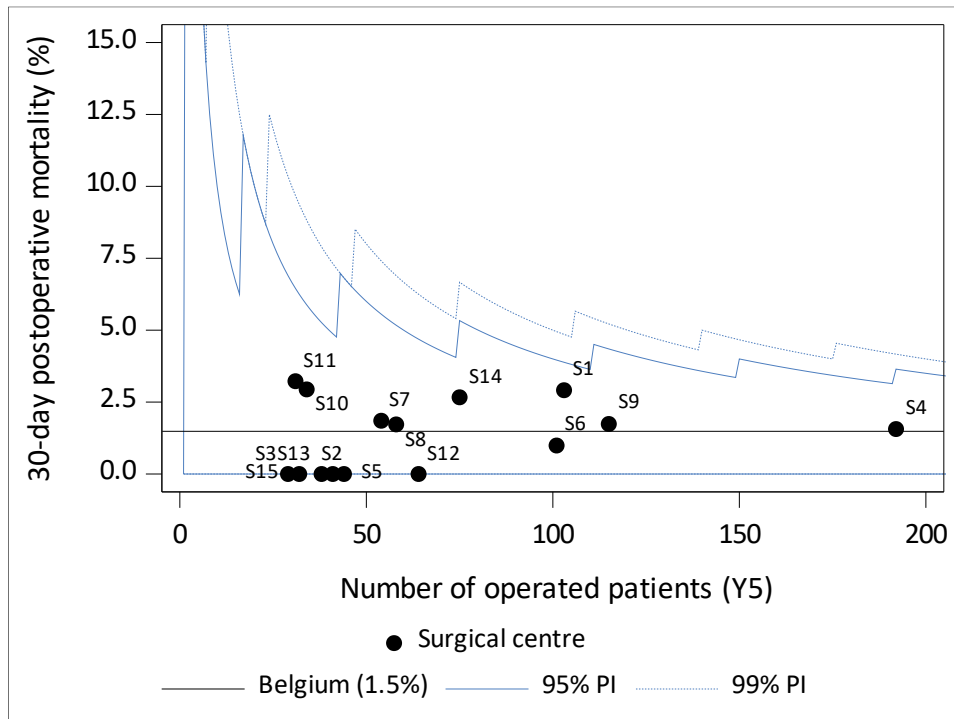
(c)



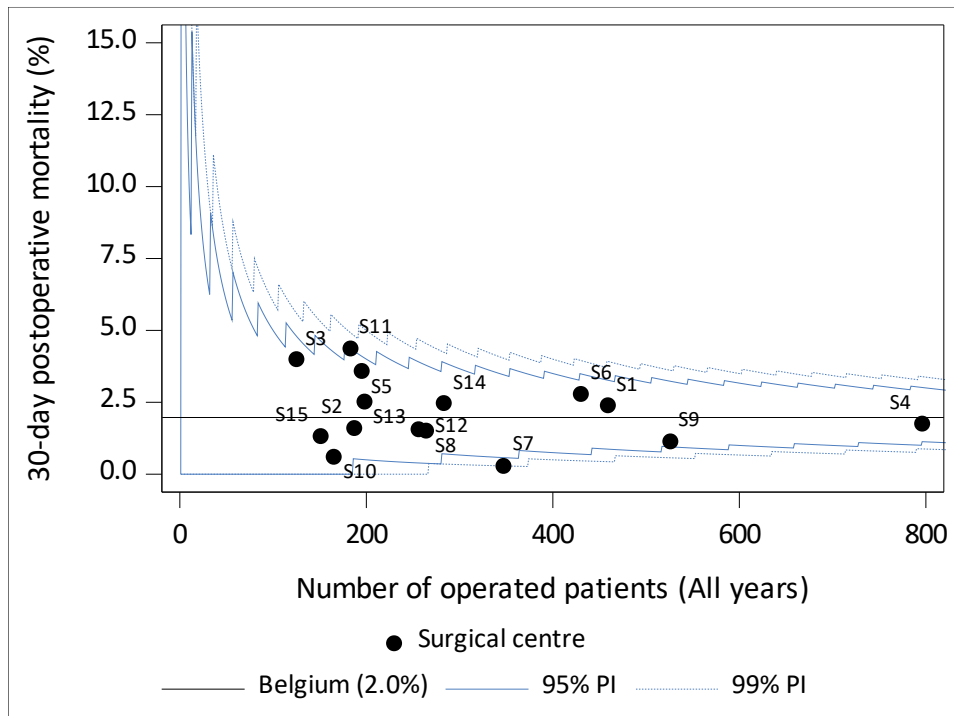
(d)



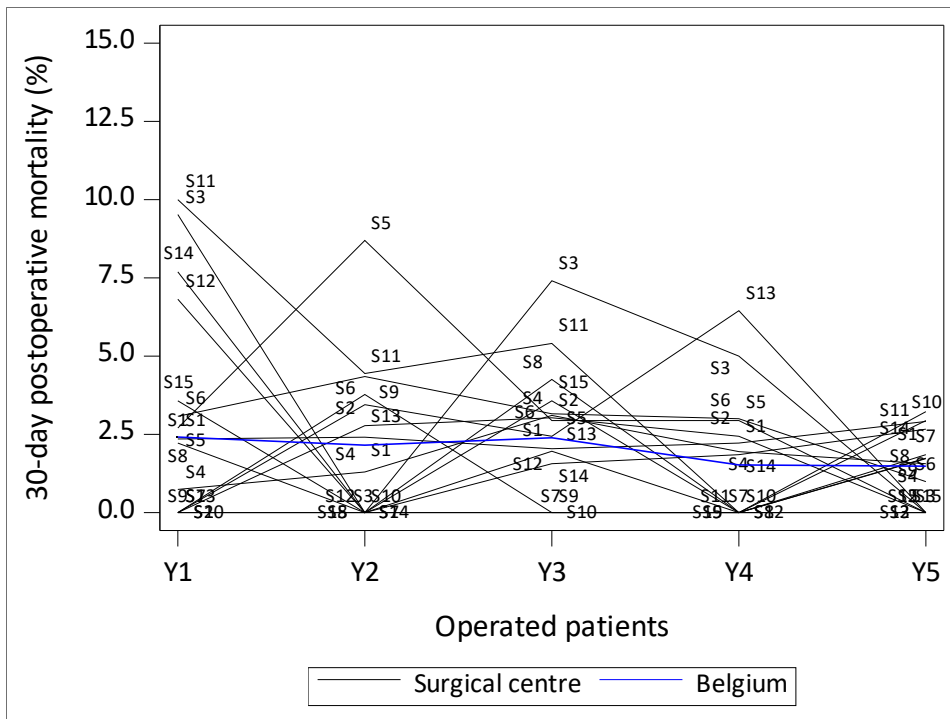
(e)



(f)



(g)



5.2.1. Unadjusted 90-day postoperative mortality

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

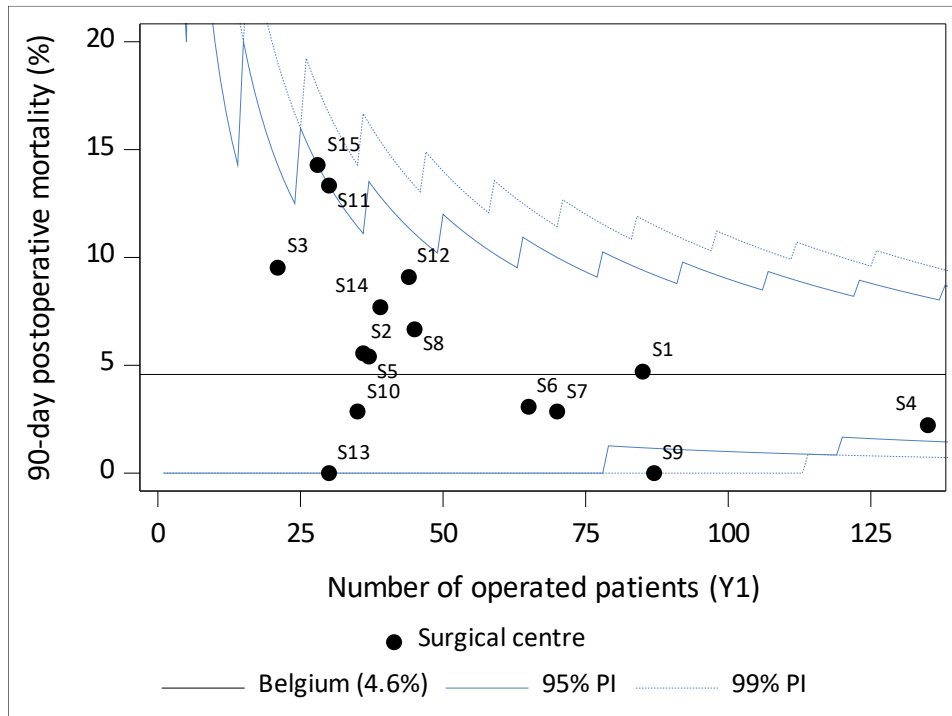
| Unadjusted 90-day postoperative mortality | | | | |
|---|--------------|-------------|------------|-------------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| Patients with surgery | 4,565 | 193 | 4.2 | [3.7, 4.9] |
| Expert centres | | | | . |
| S1 | 459 | 20 | 4.4 | [2.7, 6.6] |
| S2 | 187 | 13 | 7.0 | [3.8, 11.6] |
| S3 | 125 | 8 | 6.4 | [2.8, 12.2] |
| S4 | 796 | 30 | 3.8 | [2.6, 5.3] |
| S5 | 195 | 9 | 4.6 | [2.1, 8.6] |
| S6 | 430 | 23 | 5.3 | [3.4, 7.9] |
| S7 | 347 | 6 | 1.7 | [0.6, 3.7] |
| S8 | 264 | 12 | 4.5 | [2.4, 7.8] |
| S9 | 526 | 13 | 2.5 | [1.3, 4.2] |
| S10 | 165 | 7 | 4.2 | [1.7, 8.5] |
| S11 | 183 | 15 | 8.2 | [4.7, 13.2] |
| S12 | 256 | 8 | 3.1 | [1.4, 6.1] |
| S13 | 198 | 6 | 3.0 | [1.1, 6.5] |
| S14 | 283 | 12 | 4.2 | [2.2, 7.3] |
| S15 | 151 | 11 | 7.3 | [3.7, 12.7] |
| Convention year | | | | |
| Year 1 | 787 | 36 | 4.6 | [3.2, 6.3] |
| Year 2 | 928 | 49 | 5.3 | [3.9, 6.9] |
| Year 3 | 920 | 45 | 4.9 | [3.6, 6.5] |
| Year 4 | 919 | 30 | 3.3 | [2.2, 4.6] |
| Year 5 | 1,011 | 33 | 3.3 | [2.3, 4.6] |
| Sex | | | | |
| Male | 2,516 | 109 | 4.3 | [3.6, 5.2] |
| Female | 2,049 | 84 | 4.1 | [3.3, 5.1] |
| Age at surgery | | | | |
| <=69 | 2,685 | 71 | 2.6 | [2.1, 3.3] |
| 70-79 | 1,490 | 90 | 6.0 | [4.9, 7.4] |
| >=80 | 390 | 32 | 8.2 | [5.7, 11.4] |
| Lesion to treat (in (peri-)pancreas) | | | | |
| Primary tumour | 4,453 | 186 | 4.2 | [3.6, 4.8] |
| Relapse of primary tumour | 54 | 4 | 7.4 | [2.1, 17.9] |
| Metastasis | 58 | 3 | 5.2 | [1.1, 14.4] |
| Morphology | | | | |

| Unadjusted 90-day postoperative mortality | | | | |
|---|-------|-------------|------|-------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| Adenocarcinoma | 2,706 | 149 | 5.5 | [4.7, 6.4] |
| Neuroendocrine tumour | 535 | 14 | 2.6 | [1.4, 4.4] |
| Benign tumour | 603 | 10 | 1.7 | [0.8, 3.0] |
| Other or unspecified | 721 | 20 | 2.8 | [1.7, 4.3] |
| Charlson Comorbidity Index | | | | |
| 0 | 1,891 | 46 | 2.4 | [1.8, 3.2] |
| 1 | 1,102 | 55 | 5.0 | [3.8, 6.4] |
| 2 | 731 | 38 | 5.2 | [3.7, 7.1] |
| 3 | 379 | 18 | 4.7 | [2.8, 7.4] |
| 4 | 223 | 13 | 5.8 | [3.1, 9.8] |
| 5 | 92 | 10 | 10.9 | [5.3, 19.1] |
| 6 | 65 | 6 | 9.2 | [3.5, 19.0] |
| 7 | 37 | 3 | 8.1 | [1.7, 21.9] |
| 8 | 24 | 1 | 4.2 | [0.1, 21.1] |
| 9 | 11 | 1 | 9.1 | [0.2, 41.3] |
| 10 | 6 | 2 | 33.3 | [4.3, 77.7] |
| 11 | 2 | 0 | 0.0 | [0.0, 84.2] |
| 12 | 2 | 0 | 0.0 | [0.0, 84.2] |
| WHO score at surgery | | | | |
| 0 - Asymptomatic, normal activity | 1,347 | 32 | 2.4 | [1.6, 3.3] |
| 1 - Symptomatic, but ambulant | 2,726 | 112 | 4.1 | [3.4, 4.9] |
| 2 - Symptomatic, bedbound < 50% day | 417 | 37 | 8.9 | [6.3, 12.0] |
| 3 - Symptomatic, bedbound > 50% day | 68 | 9 | 13.2 | [6.2, 23.6] |
| 4 - Completely dependent, 100% bedbound | 7 | 3 | 42.9 | [9.9, 81.6] |
| ASA score | | | | |
| 1 - Healthy person | 291 | 6 | 2.1 | [0.8, 4.4] |
| 2 - Mild systemic disease, normal activity | 2,394 | 83 | 3.5 | [2.8, 4.3] |
| 3 - Serious systemic disease, limited activity | 1,824 | 99 | 5.4 | [4.4, 6.6] |
| 4 - Life-threatening illness, handicapped | 55 | 5 | 9.1 | [3.0, 20.0] |
| 5 - Dying | 1 | 0 | 0.0 | [0.0, 97.5] |
| Type of surgery | | | | |
| Minimally invasive surgery (MIS) – Laparoscopic | 1,237 | 30 | 2.4 | [1.6, 3.4] |
| Minimally invasive surgery (MIS) - Hybrid | 7 | 1 | 14.3 | [0.4, 57.9] |
| Minimally invasive surgery (MIS) - Robotic | 535 | 15 | 2.8 | [1.6, 4.6] |
| Open | 2,572 | 129 | 5.0 | [4.2, 5.9] |
| Conversion from MIS to open surgery | 214 | 18 | 8.4 | [5.1, 13.0] |
| RIZIV code for complex surgery | | | | |
| 242830-242841: Pancreaticoduodenectomy | 2,978 | 159 | 5.3 | [4.6, 6.2] |
| Pancreaticoduodenectomy | 2,691 | 142 | 5.3 | [4.5, 6.2] |
| Total Pancreatectomy | 287 | 17 | 5.9 | [3.5, 9.3] |

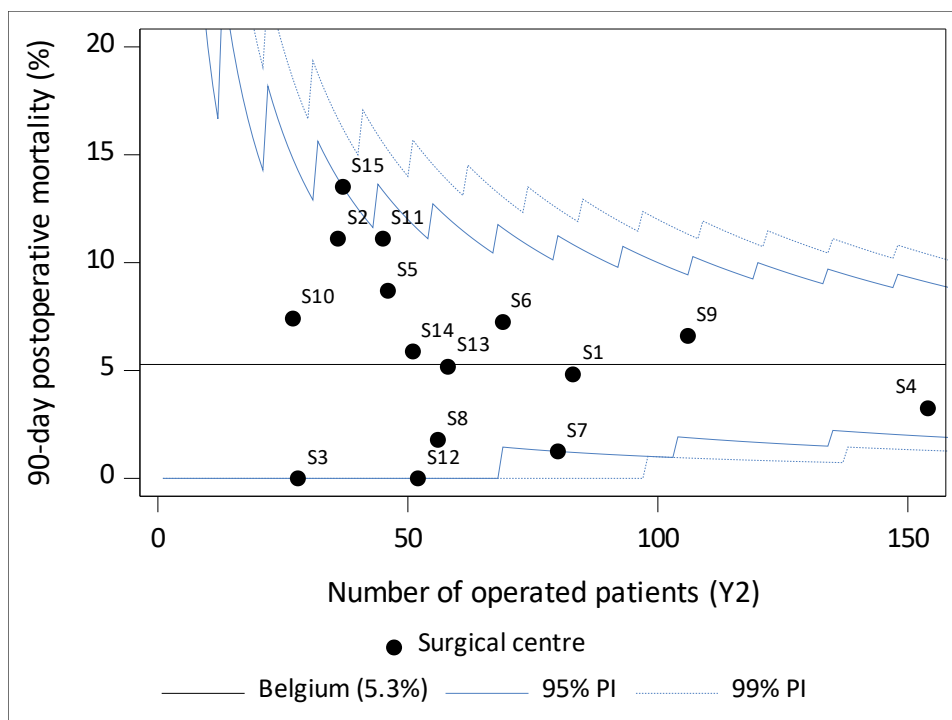
| Unadjusted 90-day postoperative mortality | | | | |
|---|-------|-------------|-----|------------|
| Belgium | | | | |
| Characteristic | N | N of deaths | % | 95% CI |
| 242852-242863: Hemipancreatectomy left with jejunal anastomosis of the resection plane of the pancreas, or almost total pancreatectomy (95 pct) | 467 | 10 | 2.1 | [1.0, 3.9] |
| 242874-242885: Hemipancreatectomy left | 1,051 | 23 | 2.2 | [1.4, 3.3] |
| 242896-242900: Enucleation of a pancreatic tumour | 69 | 1 | 1.4 | [0.0, 7.8] |
| <i>Antithrombotic medication</i> | | | | |
| No | 3,246 | 122 | 3.8 | [3.1, 4.5] |
| Yes | 1,319 | 71 | 5.4 | [4.2, 6.7] |
| <i>Was the patient referred?</i> | | | | |
| No | 2,128 | 82 | 3.9 | [3.1, 4.8] |
| Yes | 2,437 | 111 | 4.6 | [3.8, 5.5] |

Figure 56: Funnel and spaghetti plot of the unadjusted 90-day postoperative mortality for the total operated population, in the five convention years, 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.

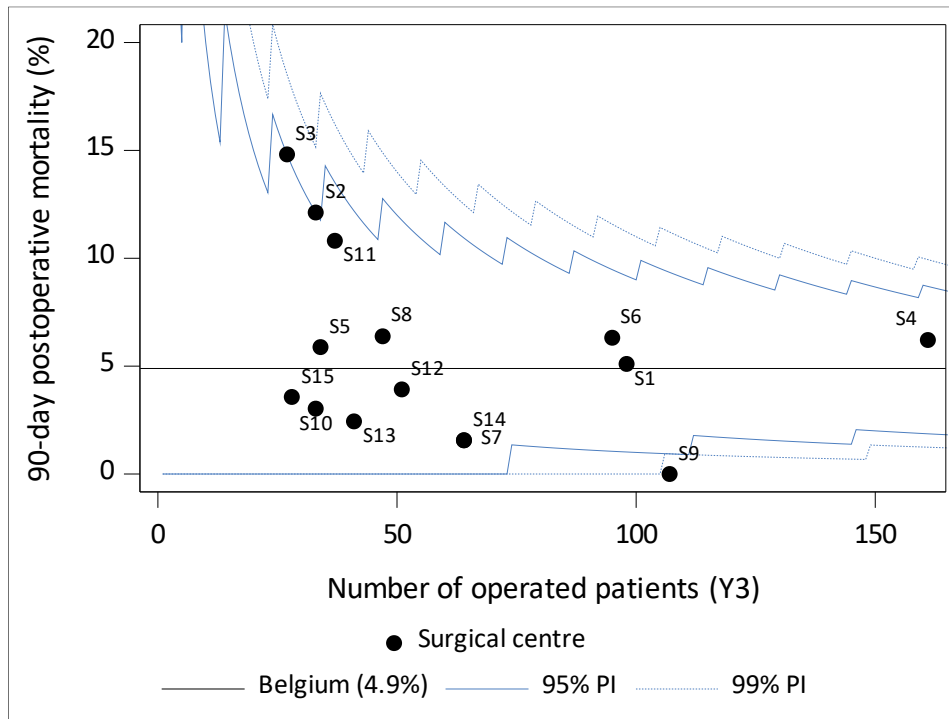
(a)



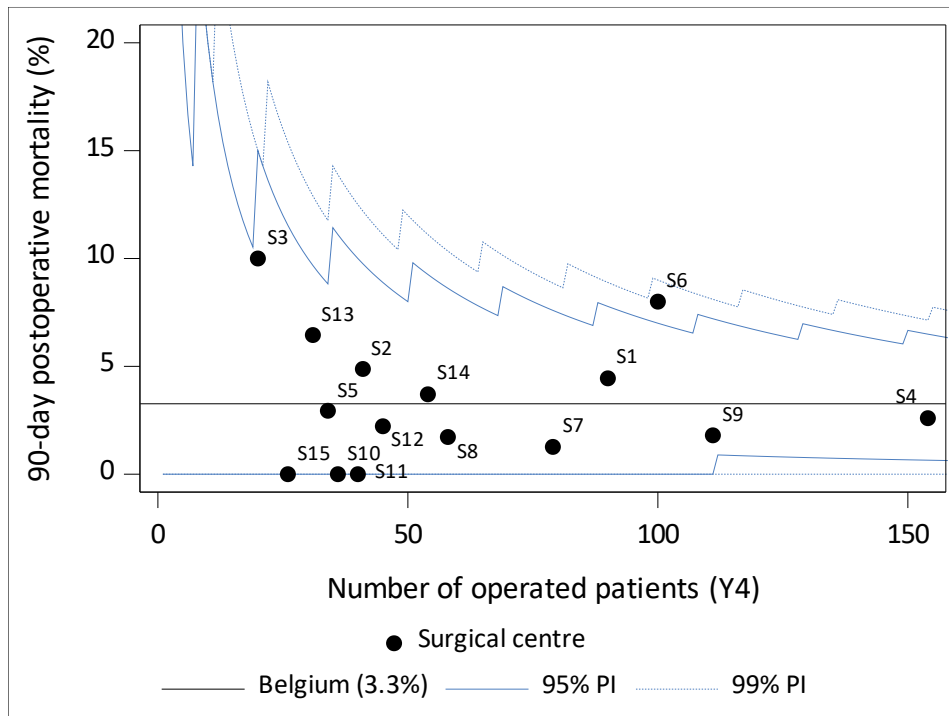
(b)



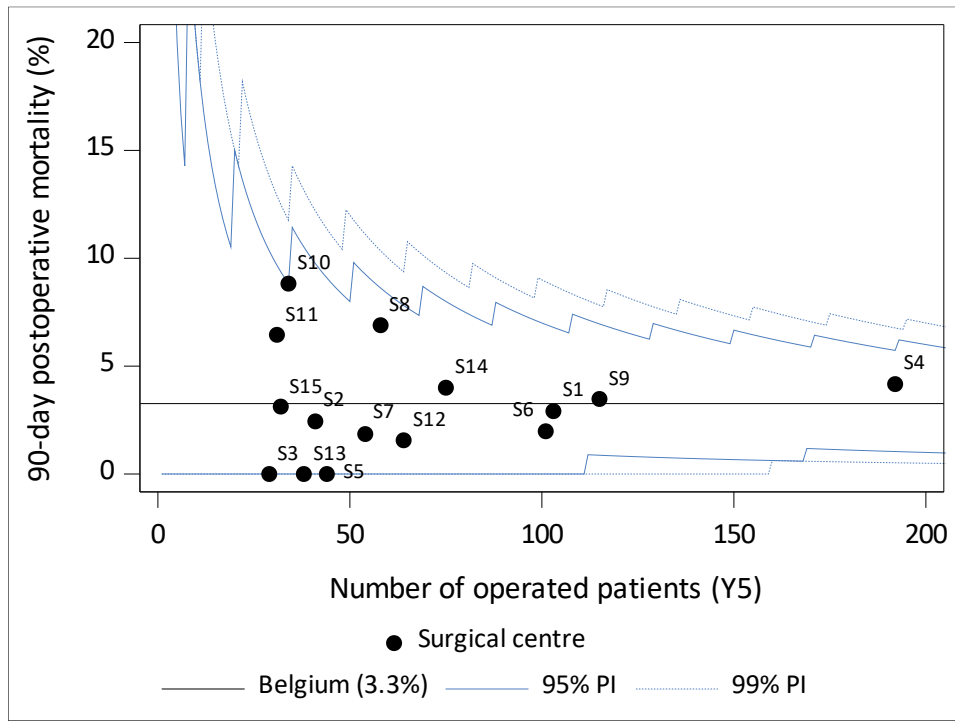
(c)



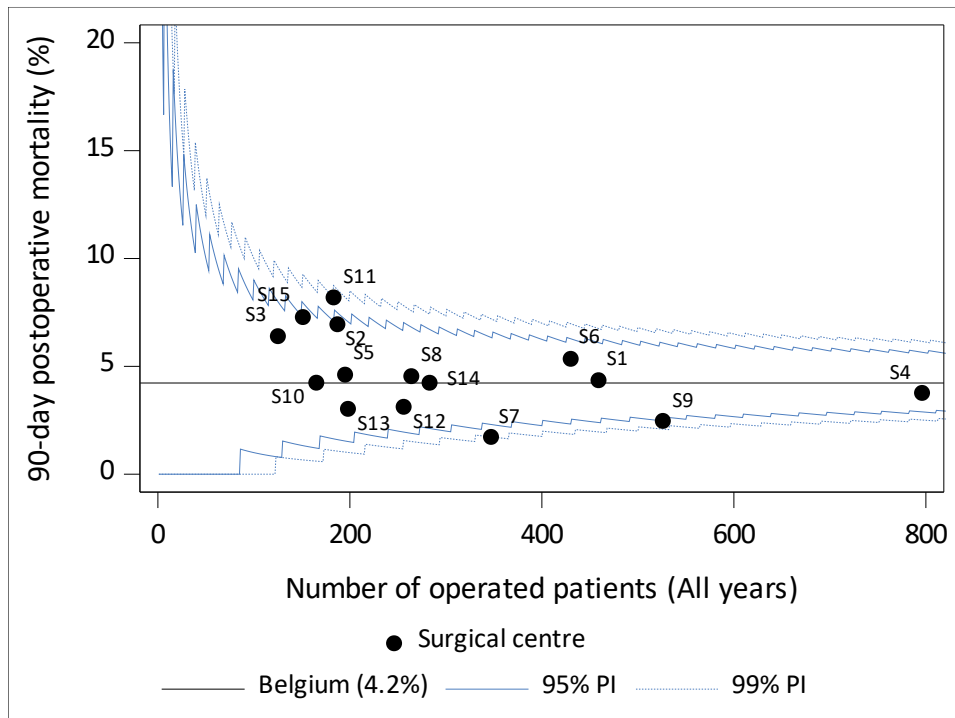
(d)



(e)



(f)



(g)

