



Surveillance of Surgical Site Infections

HELICS Implementation Phase II
HELICS-SSI Statistical Report
2000 - 2003

MARCH 2005



Project commissioned by the EC / DG SANCO/ F/ 4
Agreement Reference number: VS/1999/5235 (99CVF4-025)

HELICS-SSI Statistical Report, 2000-2003

| | | |
|----------|--|-----------|
| 1 | Preface | 3 |
| 2 | Abbreviations and country codes | 4 |
| 3 | SSI Statistical Report 2000 - 2003 | 5 |
| 3.1 | Population and methods | 5 |
| 3.1.1 | <i>Participation in the HELICS database</i> | 5 |
| 3.1.2 | <i>Compatibility</i> | 6 |
| | Missing Variables | 6 |
| | Case definitions..... | 7 |
| | Coding of surgical procedures | 8 |
| 3.2 | Results | 8 |
| 3.2.1 | <i>Characteristics of patients and surgical procedures</i> | 8 |
| | Age differences between NNIS categories | 8 |
| | Gender distribution | 9 |
| | Heterogeneity within NNIS categories | 9 |
| | Length of post-operative stay | 11 |
| | Patient/surgical procedure-related risk factors..... | 12 |
| | NNIS risk index..... | 13 |
| 3.2.2 | <i>Characteristics of infection</i> | 15 |
| | Type of SSI..... | 15 |
| | Proportion of SSIs detected during post-discharge surveillance | 16 |
| | Distribution of isolated micro-organisms | 18 |
| 3.2.3 | <i>Incidence of infection</i> | 19 |
| | Validity and precision of incidence estimates | 20 |
| | SSI Incidence by NNIS risk index | 21 |
| | Incidence differences within same NNIS surgical procedure category: HPRO | 22 |
| | SSI Incidence by duration of follow-up: time since operation | 22 |
| 4 | Discussion | 25 |
| 4.1 | Quality of data | 25 |
| 4.2 | Results | 25 |
| 4.3 | Recommendations for surveillance in Europe | 26 |
| 4.4 | Recommendations for future research and development..... | 26 |
| 5 | References | 27 |
| 6 | Appendix: reference statistical tables | 28 |

1 Preface

European Healthcare Professionals have worked together in a collaborative project called '*HELICS IV Implementation Phase II*' in 2003 and 2004, with the ultimate goal to reduce the level of nosocomial infections in European hospitals. This is an ongoing endeavour and, in a period of European enlargement, it was very encouraging to note the eagerness with which professionals from an increasing number of countries contributed.

The establishment of large reference data sets for Surgical Site Infections and Infections in Intensive Care Units represents a major achievement and offers the potential to further improve the quality and comparability of data and capacity of data exchange in the future.

The overall achievements of the HELICS IV Implementation Phase II project are described in the FINAL REPORT, published in March 2005. The present report intends to give an overview of the Surgical Site Infection (SSI) data currently held in the European Helics database and to report on the feasibility and on the comparability of data between the different networks. The analyses also served to test the new data format from the Helics-SSI protocol.

This report was prepared by Chris De Laet and Carl Suetens from the Helics data analysis group in Brussels and we like to acknowledge all those networks and individuals who made data available and helped us with valuable comments during the preparation of this report namely, Hedwig Carsauw (Belgium), Jennie Wilson (England), Outi Lyytikäinen (Finland), Bruno Grandbastien (France), Christian Brandt (Germany), Ioannis Baraboutis and Dr. Koukoutsis (Greece), Jolanta Griskeviciene and Rolanda Valinteliene (Lithuania), Edward Smyth (Northern Ireland), Piotr Heczko (Poland), Jacqui Reilly (Scotland), Angel Asensio Vegas and José Rosselló (Spain), Susan van den Hof (the Netherlands) and Tony Howard (Wales). Although their help in drafting this report was very important, we are to blame for any errors or omissions.

2 Abbreviations and country codes

Country codes use in this report are based on the EARSS protocol (EARSS manual 2004, www.earss.rivm.nl) and ISO codes (International Organization for Standardization ISO 3166-1-alpha-2-code elements): AT=Austria; BE=Belgium; BG=Bulgaria; HR=Croatia; CY=Cyprus; CZ=Czech Republic; DK=Denmark; EE=Estonia; FI=Finland; FR=France; DE=Germany; GR=Greece; HU=Hungary; IS=Iceland; IE=Ireland; IL=Israel; IT=Italy; LV=Latvia; LT=Lithuania; LU=Luxembourg; MT=Malta; NL=Netherlands; NO=Norway; PL=Poland; PT=Portugal; RO=Romania; RU=Russian Federation; SK=Slovakia; SI=Slovenia; ES=Spain; SE=Sweden; CH=Switzerland; UK=United Kingdom

To enhance readability of tables and figures, the network code was added to the country code (only for the UK): EN for England, NI for Northern Ireland, SC for Scotland and WA for Wales.

Other abbreviations, codes and definitions are as described in the SSI protocol, http://helics.univ-lyon1.fr/protocols/ssi_protocol.pdf.

3 SSI Statistical Report 2000 - 2003

3.1 Population and methods

3.1.1 Participation in the HELICS database

By December 2004 data on 171,927 surgical procedures were received from over 600 hospitals in 10 countries (Belgium, Finland, France, Germany, Greece, Lithuania, the Netherlands, Poland, Spain and the UK – England, Northern Ireland, Scotland and Wales). Overall numbers are shown in table 3.1 by type of surgical procedure. At the time of the current report, data from Denmark were still expected. Other EU countries did not yet have a national network for the surveillance of surgical site infections (SSI) at the time of the data collection. Some of those were preparing or piloting a new national protocol based on Helics methodology at the time of this report (see overview). The primary aim of this document is to report on the feasibility, and on the comparability of the data obtained from different networks.

Table 3.1. Number of surgical procedures included in Helics pilot database on surveillance of surgical site infections, by country and type of Helics selected surgical procedure categories, 2000-2003

| Country | CABG | CHOL | COLO | CSEC | HPRO | LAM | Total |
|--------------|---------------|---------------|---------------|---------------|---------------|--------------|----------------|
| BE | 617 | 114 | 1,548 | 87 | 2,409 | 2,099 | 6,874 |
| DE | 18,645 | 21,024 | 9,642 | 23,815 | 0 | 0 | 73,126 |
| ES | 250 | 734 | 1,254 | 494 | 1,408 | 163 | 4,303 |
| FI | 0 | 0 | 0 | 0 | 5,288 | 0 | 5,288 |
| FR | 0 | 3,410 | 2,406 | 1,747 | 4,364 | 0 | 11,927 |
| GR | 48 | 221 | 135 | 36 | 33 | 0 | 473 |
| LT | 0 | 962 | 245 | 451 | 221 | 0 | 1,879 |
| NL | 536 | 1,078 | 1,218 | 1,042 | 13,608 | 876 | 18,358 |
| PL | 370 | 2,682 | 648 | 1,146 | 0 | 4 | 4,850 |
| UK-EN | 7,987 | 0 | 3,702 | 0 | 26,616 | 0 | 38,305 |
| UK-NI | 0 | 0 | 0 | 0 | 2,571 | 0 | 2,571 |
| UK-SC | 0 | 0 | 0 | 1,217 | 1,997 | 0 | 3,214 |
| UK-WA | 0 | 0 | 0 | 0 | 759 | 0 | 759 |
| Total | 28,453 | 30,225 | 20,798 | 30,035 | 59,274 | 3,142 | 171,927 |

Surgical procedure categories: CABG: Coronary artery bypass grafting; CHOL: Cholecystectomy; COLO: colon surgery; CSEC: Caesarean Section; HPRO: Arthroplasty of the hip; LAM: Laminectomy. Country codes: BE: Belgium, DE: Germany, ES: Spain, FI: Finland, FR: France, GR: Greece, LT: Lithuania, NL: the Netherlands, PL: Poland, UK-EN: United Kingdom-England, UK-NI: United Kingdom-Northern Ireland, UK-SC: United Kingdom-Scotland, UK-WA: United Kingdom-Wales.

The type of surgical procedures transmitted to the EU database depended on whether these procedures were included in the national surveillance protocol or not. Several countries allow the participating hospitals to select freely the type of surgical procedures to follow-up, as a function of local needs or interests. Consequently, the number of hospitals included in the database (see table 3.2) does not necessarily represent the total number of hospitals participating in the SSI surveillance network as some networks register surgical procedures other than the ones used in the Helics protocol. Moreover, data on hip surgical procedures (HPRO: Arthroplasty of the hip) for Wales, Scotland and Northern Ireland were provided as a single dataset ("Celtic surveillance network"). This dataset did not include hospital codes because of fear that the limited number of hospitals in these networks might enable deductive disclosure of hospital identity through the number of performed surgical procedures. The coverage estimate given in table 3.2 is given only as an approximation as not all surgical procedures are carried out in every hospital and not everywhere with the same frequency.

Surveillance networks also differ with regard to the duration of surveillance. For instance, participation in the German KISS network is continuous, while in France surveillance of SSI is only performed during a 3-month period. Therefore, a smaller number of hospitals can be associated with the registration of more surgical procedures. Another difference between networks is that while in most cases surveillance is encouraged but not mandatory, surveillance for specific surgical procedures is mandatory in some countries or regions. Some registrations were not included although they were available in the surveillance: for example in Germany hip arthroplasty is included in the surveillance, but because some data were lacking (detailed ICD-code, information on urgency of operation) it was decided not to include them in this analysis.

Table 3.2. Number of surgical procedures per year, number of hospitals and coverage of total number of hospitals by country

| Country | N hosp | Total N | | 2000 | 2001 | 2002 | 2003 | Total |
|--------------|-------------------|-------------------|---------------------|--------------|---------------|---------------|---------------|----------------|
| | | hosp ¹ | Cover. % | | | | | |
| BE | 46 | 121 | 38% | 0 | 362 | 6,090 | 422 | 6,874 |
| DE | 99 | 1,995 | 5% | 0 | 21,104 | 26,799 | 25,223 | 73,126 |
| ES | 24 | 680 | 4% | 1,729 | 1,488 | 665 | 421 | 4,303 |
| FI | 8 | 50 | 16% | 1,344 | 1,929 | 2,015 | 0 | 5,288 |
| FR | 243 | 1,768 | 14% | 0 | 0 | 11,927 | 0 | 11,927 |
| GR | NA | | | 0 | 473 | 0 | 0 | 473 |
| LT | 10 | 70 | 14% | 0 | 0 | 0 | 1879 | 1,879 |
| NL | 44 | 106 | 42% | 6,366 | 5,292 | 6,167 | 533 | 18,358 |
| PL | 20 | 300 | 7% | 0 | 0 | 2,599 | 2,251 | 4,850 |
| UK-EN | 105 | 197 | 53% | 0 | 0 | 18,222 | 20,083 | 38,305 |
| UK-NI | NA ² | | | 0 | 359 | 1,216 | 996 | 2,571 |
| UK-SC | 7/NA ² | 12/NA | 58%/NA ³ | 0 | 0 | 967 | 2,247 | 3,214 |
| UK-WA | NA ² | | | 8 | 265 | 233 | 253 | 759 |
| Total | 606 | 5,299 | 11% | 9,447 | 31,272 | 76,900 | 54,308 | 171,927 |

¹Total number of acute care hospitals by country, sources: European health for all database, Jan 2004 <http://hfabd.who.dk/hfa/>, England: Analysis of Health Service Data, Martin et al, BMJ 2003;326:188-192: <http://bmj.bmjournals.com/content/vol326/issue7382/#PAPERS>, Finland: Ministry of Social Affairs and Health, 2004, <http://www.stm.fi/Resource.phx/eng/subject/health/hserv/index.htx>, and personal communications from national surveillance networks.

²Not available for HPRO

³For CSEC only

Tables 3.1 and 3.2 illustrate that there is considerable variation in the number and type of procedures supplied by participating countries. Therefore, some of the overall analyses in this report will be strongly influenced by data of one or two of the participating networks. Additionally, for countries that have supplied data on a small number of procedures the country specific results will be relatively imprecise, reflected by large confidence intervals. Therefore, all results should be interpreted with caution.

3.1.2 Compatibility

Missing Variables

Table 3.3 shows the proportion of records with non-missing values for each variable of the two main tables in the Helics-SSI protocol (ssi_o and ssi_i), by country. Mandatory identification variables constituting the unique key of a surgical procedure were 100% complete, except for the variable 'surgery unit code' that was only available for Germany. This latter variable was included in the protocol (and in the unique key for the surgical procedure) in order to link SSI data to surgical unit characteristics and practices. However, the limited availability of this variable indicates that in most instances it will only be possible to make the link at the hospital level. Since it appears to be difficult to collect this variable, consideration should be given to removing the surgical unit code from the key (or use a dummy variable instead when not available) and either to remove it from the protocol or to classify it as non-mandatory.

Components of the NNIS risk index (wound contamination class, duration of operation and ASA physical status classification) were not always available, although they are mandatory. However, rather than excluding the records completely from the database, adding a category "missing NNIS risk index" for the stratification of the SSI rates was a partial solution for this problem. Therefore, although these variables are very important for risk adjustment, their categorization in the protocol should be changed from "mandatory" to "required". Otherwise, data for which one of the NNIS risk index components is missing could not be accepted resulting in an important loss of information and bias for the EU database. The last line of the tables indicates the proportion of procedures where the NNIS risk index could be calculated.

ICD-9-CM surgical procedure codes were not available for all countries. Those ICD-9-CM codes, however, can be important to differentiate between surgical procedures within one NNIS surgical category that can be associated with different infection risks. The microorganism variable was considered non-missing if any data had been entered, including the missing code.

Table 3.3. Percentage of non-missing values by country, for variables included in the Helics protocol for the surveillance of surgical site infections, surgical procedure data and infection data

| A* Variable Label | BE | DE | ES | FI | FR | GR | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Country Mean | Database mean |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|---------------|
| Operative procedure data | | | | | | | | | | | | | | | |
| M Country code | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| M Identification code of Surveillance Network | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| M Surveillance component code | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| M Hospital code | 100 | 100 | 100 | 100 | 100 | 0 | 100 | 100 | 100 | 100 | 0 | 37.9 | 0 | 72.1 | 96.6 |
| M Surgery unit code | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.7 | 42.5 |
| M Operative procedure ID | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| R Age (years) | 72 | 100 | 100 | 100 | 99.94 | 100 | 98.2 | 100 | 100 | 99.4 | 99.8 | 91.0 | 99.6 | 96.9 | 98.6 |
| R Gender | 98.3 | 100 | 99.7 | 100 | 100 | 7.6 | 100 | 100 | 100 | 99.4 | 99.5 | 100 | 99.7 | 92.6 | 99.5 |
| O Date of hospital admission | 100 | 0 | 100 | 0 | 100 | 100 | 99.9 | 100 | 100 | 99.7 | 99.6 | 100 | 98.8 | 84.5 | 54.3 |
| M Date of operation | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| R Discharge date <i>or</i> date of last follow-up in the hospital | 96.9 | 0 | 99.8 | 88.1 | 99.9 | 100 | 98.8 | 93.7 | 3.7 | 100 | 99.6 | 99.1 | 98.8 | 83.0 | 53.5 |
| R Discharge status | 95.7 | 0 | 0 | 92.9 | 0 | 0 | 0 | 0 | 3.7 | 98.9 | 0 | 37.9 | 0 | 25.3 | 29.5 |
| O Date of last follow-up post-discharge | 96.8 | 0 | 0 | 0 | 100 | 0 | 98.8 | 12.7 | 0 | 0 | 0 | 37.7 | 0 | 26.6 | 14.0 |
| M Primary operation code, NNIS category | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| O Primary operation code, ICD-9- CM | 84.6 | 0.0 | 7.2 | 99.9 | 0.0 | 99.8 | 100 | 0.0 | 2.7 | 100.0 | 88.1 | 62.1 | 94.6 | 56.8 | 33.3 |
| M Wound contamination class | 97.63 | 100 | 99.9 | 98.13 | 100 | 95.14 | 99.36 | 96.93 | 99.55 | 99.57 | 97.0 | 95.9 | 100 | 98.4 | 99.3 |
| M Duration of operation | 98.6 | 99.8 | 100 | 96.4 | 100 | 99.6 | 98.1 | 99.8 | 99.2 | 97.8 | 95.0 | 88.6 | 50.5 | 94.1 | 98.7 |
| M ASA physical status classification | 93.7 | 100 | 100 | 88.62 | 99.37 | 0 | 76.53 | 94.17 | 88.39 | 81.2 | 93.3 | 68.2 | 100 | 83.3 | 93.0 |
| R Urgent/elective operation | 100 | 0 | 100 | 95.42 | 98.16 | 95.14 | 99.89 | 97.39 | 3.7 | 99.2 | 99.1 | 99.9 | 97.9 | 83.5 | 54.0 |
| R Endoscopic procedure | 100 | 100 | 100 | 100 | 97.8 | 0 | 99.7 | 0 | 99.2 | 100 | 100 | 100 | 100 | 84.4 | 88.9 |
| O Perioperative prophylactic antibiotics | 33.8 | 0 | 94.7 | 0 | 0 | 100 | 98.9 | 99.9 | 0 | 98.6 | 98.4 | 98.4 | 99.5 | 63.2 | 41.5 |
| M Surgical site infection | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Infection data | | | | | | | | | | | | | | | |
| R Type of SSI | 100 | 96.5 | 100 | 100 | 100 | 95.7 | 95.5 | 99.7 | 72.7 | 99.7 | 100 | 99.4 | 100 | 96.9 | 98.0 |
| M Date of infection | 100 | 100 | 100 | 100 | 100 | 100 | 92.1 | 100 | 100 | 100 | 90.9 | 98.8 | 91.3 | 98 | 99.8 |
| O Micro-organism | 56.2 | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 99.6 | 0 | 0 | 0 | 35.1 | 65.4 |
| O Resistance micro-organism | 0 | 21.0 | 0 | 0 | 0 | 0 | 6.8 | 0 | 86.9 | 28.1 | 0 | 0 | 0 | 11.0 | 16.0 |
| Total % (mean) | 85.5 | 69.9 | 77.0 | 75.4 | 76.7 | 65.1 | 87.0 | 72.9 | 71.5 | 88.5 | 75.4 | 77.5 | 74.3 | 76.7 | 76.0 |
| Total %, M&R only | 97.5 | 84.0 | 94.7 | 97.9 | 94.5 | 73.3 | 92.5 | 88.5 | 82.6 | 98.7 | 88.1 | 90.4 | 86.2 | 89.9 | 90.0 |
| Calculated variables | | | | | | | | | | | | | | | |
| <i>Last follow-up date after discharge date</i> | <i>66.9</i> | <i>0</i> | <i>0</i> | <i>0</i> | <i>71.0</i> | <i>0</i> | <i>0</i> | <i>12.5</i> | <i>0</i> | <i>0</i> | <i>0</i> | <i>26.8</i> | <i>0</i> | <i>13.6</i> | <i>9.4</i> |
| <i>Possible to calculate NNIS Risk Index</i> | <i>91.5</i> | <i>99.8</i> | <i>99.9</i> | <i>85.0</i> | <i>99.3</i> | <i>0.0</i> | <i>74.9</i> | <i>93.2</i> | <i>87.4</i> | <i>79.3</i> | <i>86.2</i> | <i>59.6</i> | <i>50.5</i> | <i>77.4</i> | <i>91.6</i> |

A: field attribute: M=mandatory: if missing, record will be rejected in routine data analysis/collection, R=required: used for routine analysis, record not rejected if missing, O=optional. Country codes: BE: Belgium, DE: Germany; ES: Spain, FI: Finland, FR: France, GR: Greece, LT: Lithuania, NL: the Netherlands, PL: Poland, UK-EN: United Kingdom-England, UK-NI: United Kingdom-Northern Ireland, UK-SC: United Kingdom-Scotland, UK-WA: United Kingdom-Wales.

The mean percentage of non-missing values can be expressed either as an average of the country means (column "country mean" in table 3.3, giving equal weight to each country) or as the average in the entire database (more influenced by "large" countries). When expressed as the average of the country means, the overall compatibility (percentage of non-missing values) for surgical procedure and infection data combined was 77% (considering mandatory, required and optional variables) ranging from 65% to 89%. When only mandatory (if missing, records will be rejected in routine data collection), without surgical unit code (see above) and required fields (used for routine analysis) were considered, the mean overall compatibility was as high at 90%, ranging from 73% to 99%. The mean compatibility for required variables was 80%, and 46% for optional variables. When expressed as weighted averages these overall numbers changed only slightly as shown in the last column of table 3.3.

Case definitions

There are some differences in interpretation of the CDC definitions for SSI between countries. For example, the criterion based on the culture of organisms from the wound may include wound swabs in some countries, but only fluid or tissue in others. In the English SSI surveillance system, the case-definition has been slightly modified from the CDC definition. Superficial incisional SSI requires the presence of two rather than one clinical sign together with a clinician's diagnosis, and clinician's diagnosis alone is not used as a criterion. The effect of these and other differences on rates of SSI, although probably small, is difficult to ascertain. However, differences in sensitivity and specificity of the case-finding are likely to have a more important impact, and this will also be influenced by how the surveillance of surgical site infections is perceived by the local hospital, in particular whether the surveillance is mainly undertaken as a quality assurance tool or because of a legal or financial obligation.

Coding of surgical procedures

In several countries specific codes for surgical procedures, different from ICD-9-CM are used. For example in the UK, OPCS codes are used in the SSI surveillance data collected. The categories of surgical procedure used in the surveillance scheme have been based on the same grouping of surgical procedures in NNIS. In most countries it appears to be possible to derive ICD-9-CM codes corresponding to the codes recorded by hospitals in that country, and networks are encouraged to translate their national coding schemes to ICD-9-CM codes whenever possible.

3.2 Results

3.2.1 Characteristics of patients and surgical procedures

Age differences between NNIS categories

The age of the patients was known for almost all the interventions (98.6%). Table 3.4 shows the median age by surgical procedure and by country. Age was lowest for Caesarean section and highest for hip arthroplasty.

Table 3.4. Median age (years) by surgical procedure and country

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|------|----|----|----|----|----|----|----|----|----|-------|-------|-------|-------|-------|
| CABG | 69 | 69 | 67 | | | 65 | | 64 | 64 | 67 | | | | 68 |
| CHOL | 59 | 60 | 61 | | 57 | 61 | 59 | 52 | 58 | | | | | 60 |
| COLO | 68 | 69 | 69 | | 68 | 69 | 69 | 68 | 66 | 69 | | | | 69 |
| CSEC | 28 | 33 | 30 | | 30 | 28 | 28 | 31 | 27 | | | 31 | | 32 |
| HPRO | 72 | | 72 | 71 | 73 | 70 | 70 | 72 | | 74 | 69 | 69 | 72 | 73 |
| LAM | 48 | | 45 | | | | | 52 | 55 | | | | | 50 |

Figure 3.1 shows the overall age distribution by surgical procedure. The box shows the median value surrounded by two quartiles, while the whiskers indicate the range of values (upper and lower adjacent values as defined by Tukey; Tukey JW, Exploratory Data Analysis, 1977 Addison-Wesley Publishing Co.). The data contained a few age outliers (shown by the dots) that might be unlikely for the surgical procedure in which they were performed, e.g. C-section in children or in women over 50 years of age. It is, however, difficult to exclude data based on this criterion alone: what for example should be done with a cholecystectomy with a registered age of 120 years? Since age is used in only a limited number of analyses we did not excluded any observations for this reason.

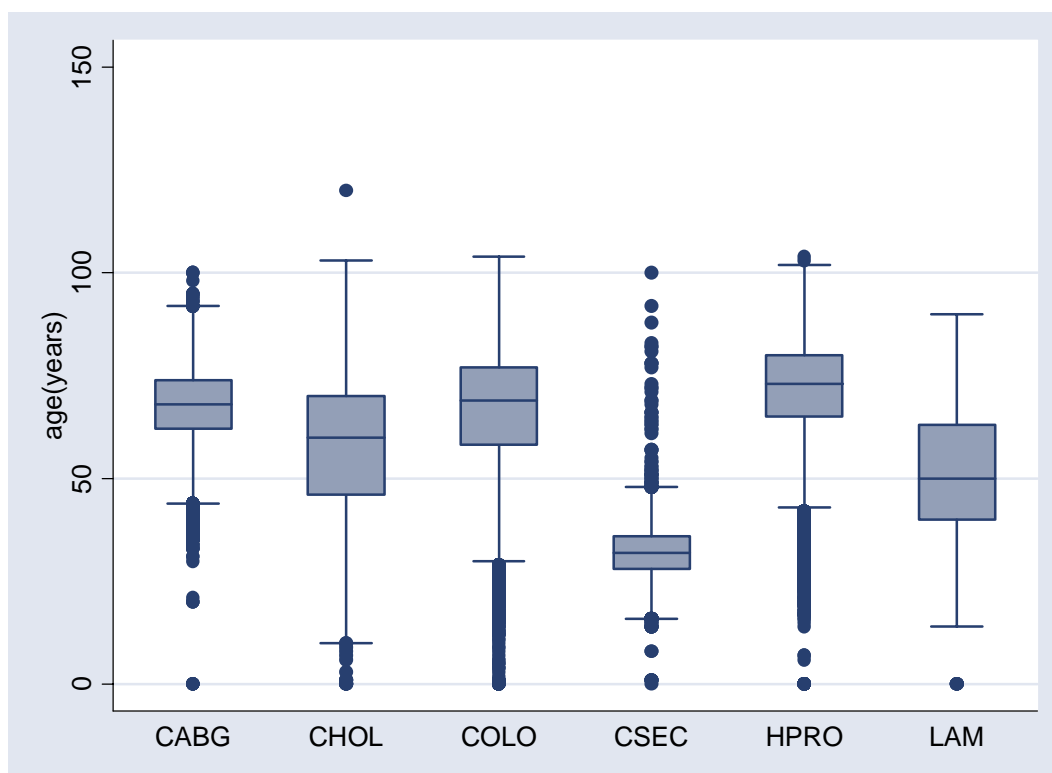


Figure 3.1. Age distribution by surgical procedure

Gender distribution

Gender distribution by surgical procedure and country is given in table 3.5. Coronary artery bypass grafting is more frequently performed in men, colon surgery and laminectomy equally in both sexes, cholecystectomy and hip replacement more frequently in women. According to the registered information 37 (0.1%) caesarean sections occurred in men, but this was considered to be erroneous gender information.

Table 3.5. Gender (% female) by surgical procedure and country

| | BE | DE | ES | FI | FR | GR ¹ | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|------|------|------|------|-----|------|-----------------|------|------|-----|-------|-------|-------|-------|-------|
| CABG | 29% | 24% | 22% | | | | | 19% | 21% | 20% | | | | 23% |
| CHOL | 66% | 69% | 64% | | 67% | | 79% | 71% | 75% | | | | | 69% |
| COLO | 50% | 54% | 41% | | 50% | | 56% | 53% | 49% | 46% | | | | 51% |
| CSEC | 100% | 100% | 100% | | 100% | 100% | 100% | 100% | 99% | | | 100% | | 100% |
| HPRO | 65% | | 61% | 63% | 61% | | 67% | 72% | | 67% | 57% | 64% | 60% | 66% |
| LAM | 46% | | 47% | | | | | 49% | 50% | | | | | 47% |

1 No gender information for Greece, female gender assumed for CSEC

Heterogeneity within NNIS categories

Patient characteristics may also vary considerably within the same surgical procedure category, pointing to heterogeneity within NNIS categories. As an example we show in table 3.6 the heterogeneity of age and gender within the hip prosthesis category by ICD-9-CM code.

Table 3.6. Median age and percentage of female patients in hip arthroplasty (HPRO) by ICD-9-CM code and country

| | BE | ES ¹ | FI | FR | GR | LT ² | NL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|-------------------------|----|-----------------|----|----|----|-----------------|----|-------|-------|-------|-------|-------|
| Median age | | | | | | | | | | | | |
| Total hip replacement | | | | | | | | | | | | |
| (81.51) | 71 | 69 | 67 | | 64 | | | 71 | 68 | 68 | 69 | 70 |
| Partial hip replacement | | | | | | | | | | | | |
| (81.52) | 80 | 85 | 81 | | 74 | | | 83 | 79 | 81 | 83 | 83 |

| | | | | | | | | | | | | |
|-------------------------------------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| Revision of hip replacement (81.53) | 71 | | 70 | | | | | 73 | 72 | 72 | 77 | 72 |
| All HPRO | 72 | 72 | 71 | 73 | 70 | 70 | 72 | 74 | 69 | 69 | 72 | 73 |
| % female patients | | | | | | | | | | | | |
| Total hip replacement (81.51) | 63.6% | 64.6% | 58.8% | | | | | 62.1% | 56.4% | 62.9% | 57.5% | 61.3% |
| Partial hip replacement (81.52) | 75.7% | 81.6% | 74.1% | | | | | 78.8% | 81.7% | 78.2% | 76.8% | 78.1% |
| Revision of hip replacement (81.53) | 62.0% | | 60.5% | | | | | 60.8% | 56.4% | 55.8% | 39.3% | 60.2% |
| All HPRO | 64.6% | 61.1% | 63.0% | 61.2% | NA ³ | 66.5% | 71.5% | 66.6% | 57.1% | 63.8% | 59.8% | 66.2% |

1 Only 191 HPRO in Spain had ICD-9-CM codes available

2 Only 3 digits of ICD codes for Lithuania

3 No gender information for Greece

The median age in partial hip replacement (ICD-9-CM code 81.52) was 83 years while it was only 70 years in total hip replacement (ICD-9-CM code 81.51) and 72 in revisions of hip replacement (code 81.53). This difference is probably related to the main indications for these surgical procedures, i.e. pain and functional disability due to osteoarthritis for 81.51 and hip fracture for 81.52, although indications may vary between countries due to a lack of consensus (Merx H, Dreinhofer K, et al. International variation in hip replacement rates. *Ann Rheum Dis.* 2003 Mar;62(3):222-6). The fact that partial hip replacement is more frequently performed in female patients also seems to support that hip fracture (more frequent in elderly women) is an important indication in these surgical procedures.

Figure 3.2 shows that within the HPRO category proportionally more total hip replacements are performed in Belgium compared to Finland and England, but the proportion of total hip replacements is also high in Scotland, Northern Ireland and Wales. This could be related to differences in healthcare systems in these countries, but may also be explained by the type of hospitals contributing data to the network (for example whether they include trauma orthopaedic services) and whether data on all partial hip replacements are included in the data collected (for example, partial hip replacements, which are commonly undertaken as emergency procedures, may be missed from the routine surveillance systems). These different operations (reflecting different indications) can be associated with real differences in SSI risks that can only be identified when ICD-9-CM codes are available but that are not identifiable with only the NNIS surgical procedure categories. In the chapter on SSI incidence we included some additional analysis of this heterogeneity.

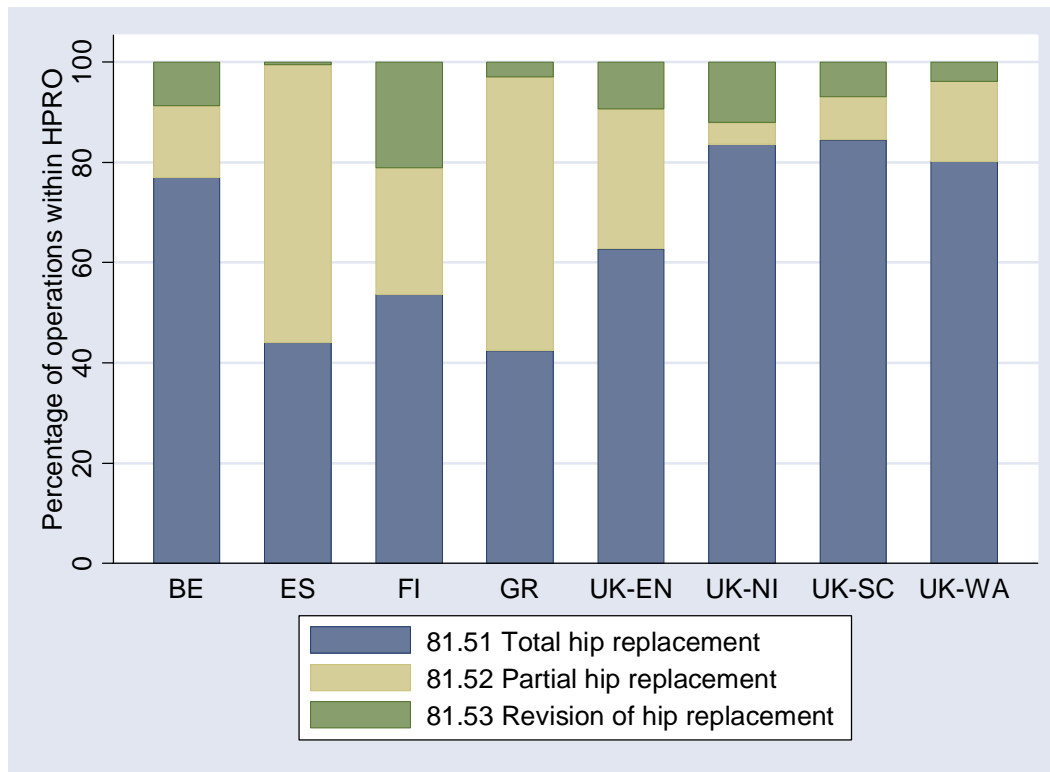


Figure 3.2. Differences in type of hip surgical procedures within the HPRO category by country

Length of post-operative stay

A major factor influencing the detection of surgical site infections is the duration of the post-operative stay in the hospital. After discharge, the detection of SSI is entirely dependent on the intensity of post-discharge surveillance organized by the hospital. Artificial differences in infection rates due to different or non-existent post-discharge surveillance are more likely to occur in surgical procedures with on average a shorter length of stay. The median length of post-operative stay in the hospitals is given in table 3.7 and figure 3, and is the shortest for cholecystectomy, followed by C-section and laminectomy. The markedly lower post-operative hospital stay for example in HPRO in Finland is related to the fact that patients are rapidly transferred to specialized rehabilitation units, where the chance of detection of SSIs is still high.

Table 3.7. Median post-operative length of hospital stay (days) by operation category and country

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|------|----|----|----|----|----|----|----|----|----|-------|-------|-------|-------|-------|
| CABG | 11 | | 10 | | | 9 | | 10 | | 8 | | | | 9 |
| CHOL | 4 | | 5 | | 5 | 3 | 5 | 4 | | | | | | 5 |
| COLO | 12 | | 11 | | 12 | 9 | 13 | 12 | | 11 | | | | 12 |
| CSEC | 8 | | 6 | | 7 | 6 | 7 | 6 | | | | 5 | | 6 |
| HPRO | 13 | | 11 | 8 | 12 | 9 | 12 | 10 | | 10 | 6 | 8 | 11 | 10 |
| LAM | 6 | | 6 | | | | | 6 | | | | | | 6 |

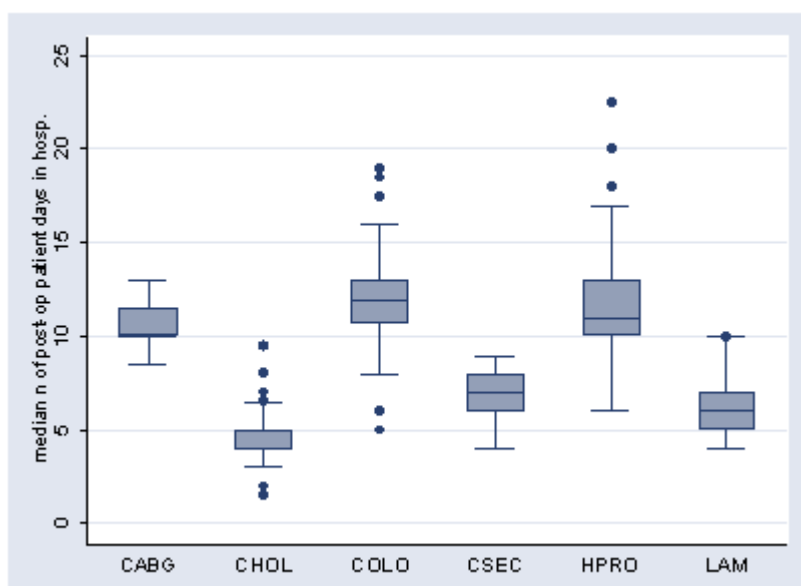


Figure 3.3. Median number of post-operative patient-days in hospital by operation category, aggregated by hospital, hospitals with ≥ 20 interventions

Patient/surgical procedure-related risk factors

Patient/surgical procedure-related risk factors included in the NNIS risk index are wound contamination class, ASA physical status classification (used in anesthesia), duration of the operation (information on the availability of these variables in table 3.3), and whether or not the entire operation was performed using an endoscope (cholecystectomy and colon surgery: table 3.8).

Table 3.8. Percentage surgical procedures carried out using an endoscope

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|------|-------|-------|-------|-------|--------------|-------|--------------|-------|------|-------|-------|-------|-------|-------|
| CHOL | 79.8% | 82.8% | 48.1% | 81.4% | ¹ | 92.9% | ¹ | 51.7% | | | | | | 79.2% |
| COLO | 12.5% | 8.6% | 3.0% | 17.3% | ¹ | 0.4% | ¹ | 1.7% | 0.0% | | | | | 7.6% |

¹ No information available at time of analysis, might be available in future

Endoscope use, however, was not consistently recorded in all countries, and some countries (England) excluded endoscopic interventions. Therefore, the basic NNIS risk index was used for further analyses.

For the duration of the operation, the 75th percentiles (T-times) from NNIS were used as a threshold. Percentile distributions for the European hospitals were similar to these, although slightly lower for HPRO (110 vs. 120), CHOL (88 vs. 120), CSEC (46 vs. 60), CABG (226 vs. 240 or 300). For LAM it was 120 minutes in both registrations.

Table 3.9. Percentiles of the distribution of duration of operation in European hospitals (in minutes)

| | Mean | p10 | P25 | p50 | P75 | p90 |
|------|------|-----|-----|-----|-----|-----|
| CABG | 194 | 123 | 150 | 185 | 226 | 270 |
| CHOL | 71 | 35 | 45 | 60 | 88 | 120 |
| COLO | 142 | 60 | 90 | 130 | 180 | 230 |
| CSEC | 40 | 24 | 30 | 37 | 46 | 60 |
| HPRO | 95 | 50 | 63 | 85 | 110 | 145 |
| LAM | 86 | 30 | 45 | 70 | 120 | 150 |

NNIS risk index

The NNIS risk index was computed from the wound contamination class (1 point if >2, contaminated or dirty/infected wounds), the ASA physical status classification (1 point if >2, severe systemic disease to moribund patient) and the duration of the operation (> 75th percentile of NNIS distribution). Missing values for one of the 3 components resulted in a missing risk index, which occurred in 8.4% of records overall, and only for Greece no NNIS risk index could be computed due to missing data on ASA classification. However, since some networks excluded records for which the risk index was missing before transmission because these variables were described as mandatory in the protocol, this percentage is certainly underestimated.

The comparison of the risk index by surgical procedure and by country (figure 4A - C) shows the expected differences between the prevalence of risk factors according to the type of operation, but it also shows important variations between countries within the same NNIS procedure category, a variation that is also reported between hospitals within one country, for example in Germany (C. Brandt, personal communication). E.g. in colon surgery, Germany and Spain have higher risk indices than Belgium, France, the Netherlands and England, with Poland and Lithuania in an intermediate position. Similar differences are noted for other surgical procedure categories specifically showing consistently high risk levels in Spain. These differences may be related to a selection of more severe patients, to differences in types of surgical procedures within the same category, to differences in the application of the definitions of the risk index components or to a combination of all of these.

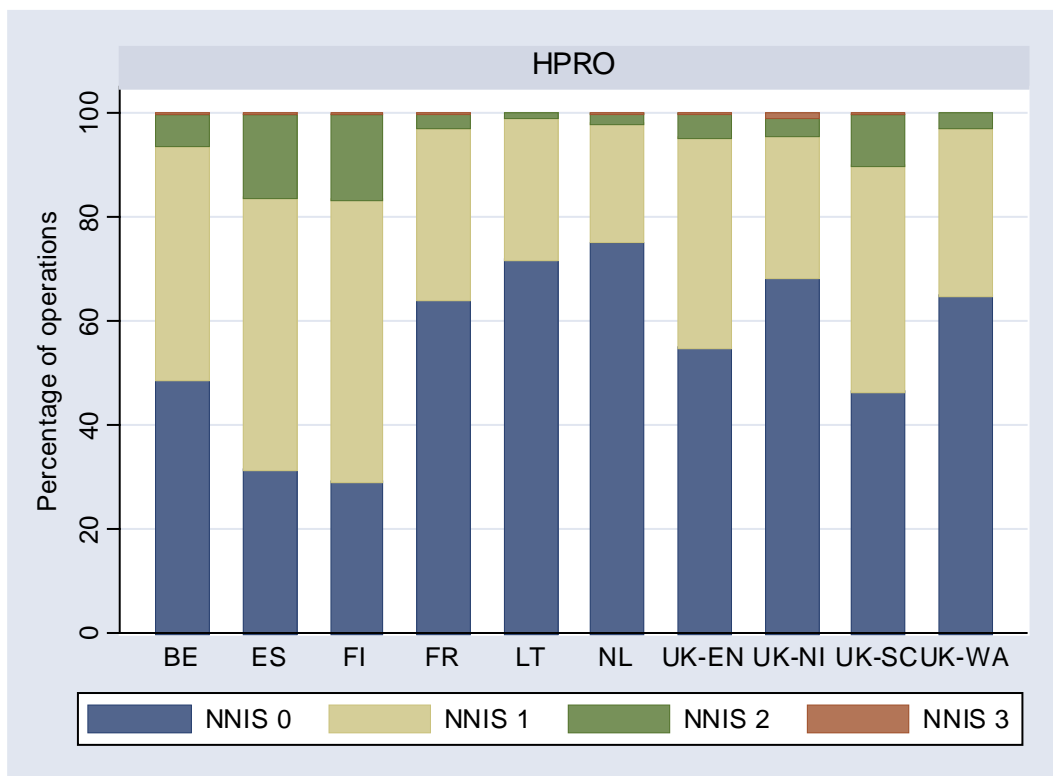


Figure 3.4A. Distribution of NNIS risk index for HPRO by country, hospitals with >=20 surgical procedures in category

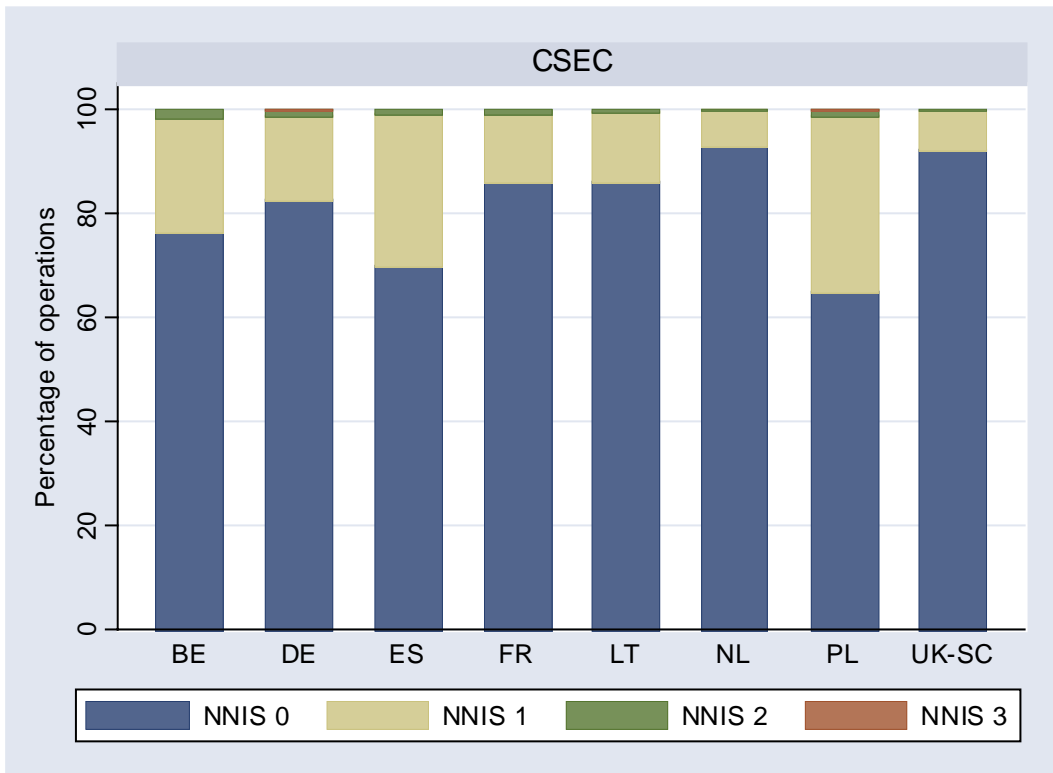


Figure 3.4B. Distribution of NNIS risk index for CSEC by country , hospitals with ≥ 20 surgical procedures in category

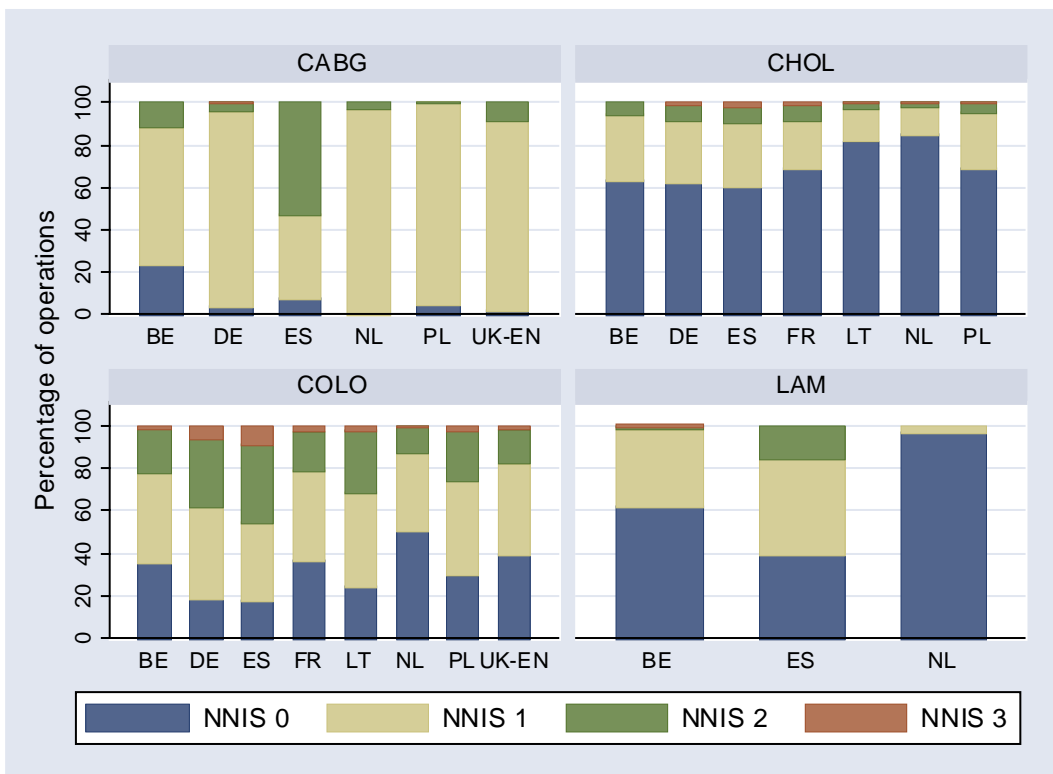


Figure 3.4C. Distribution of NNIS risk index for CABG, CHOL, COLO and LAM by country, hospitals with ≥ 20 surgical procedures in category

3.2.2 Characteristics of infection

Type of SSI

Surgical site infections are classified in 3 categories (see protocol for details), which are used by all surveillance networks. Again, major differences between countries (and between hospitals within the same country) were observed in the type of reported SSI within a same operation category (figure 5A - C). E.g., in each category, France reported the lowest proportion of superficial incisional infections, while in the Netherlands organ/space infections were seldom reported. These differences may be due to true differences in the severity of infections, to differences in the interpretation of the case definition, to differences in the sensitivity of case finding/reporting (hospitals may consider superficial infections as not important), or to a combination of all of these reasons.

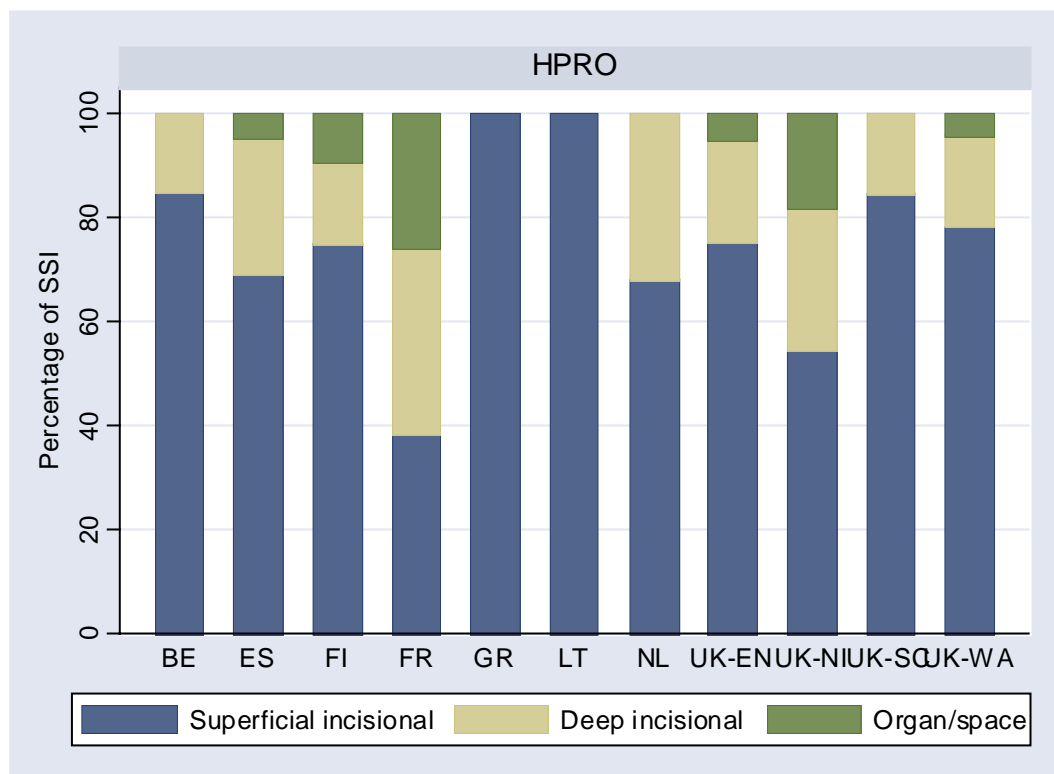


Figure 3.5A. Type of surgical site infections for HPRO by country, hospitals with ≥ 20 surgical procedures in category

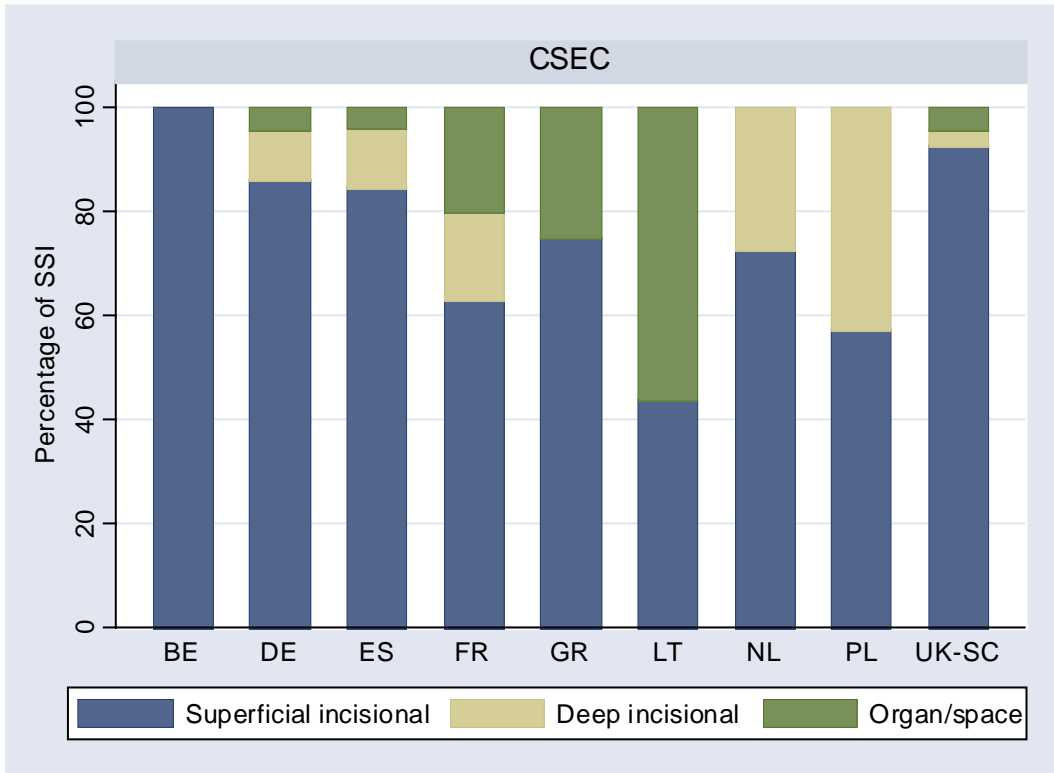


Figure 3.5B. Type of surgical site infections for CSEC by country, hospitals with ≥ 20 surgical procedures in category

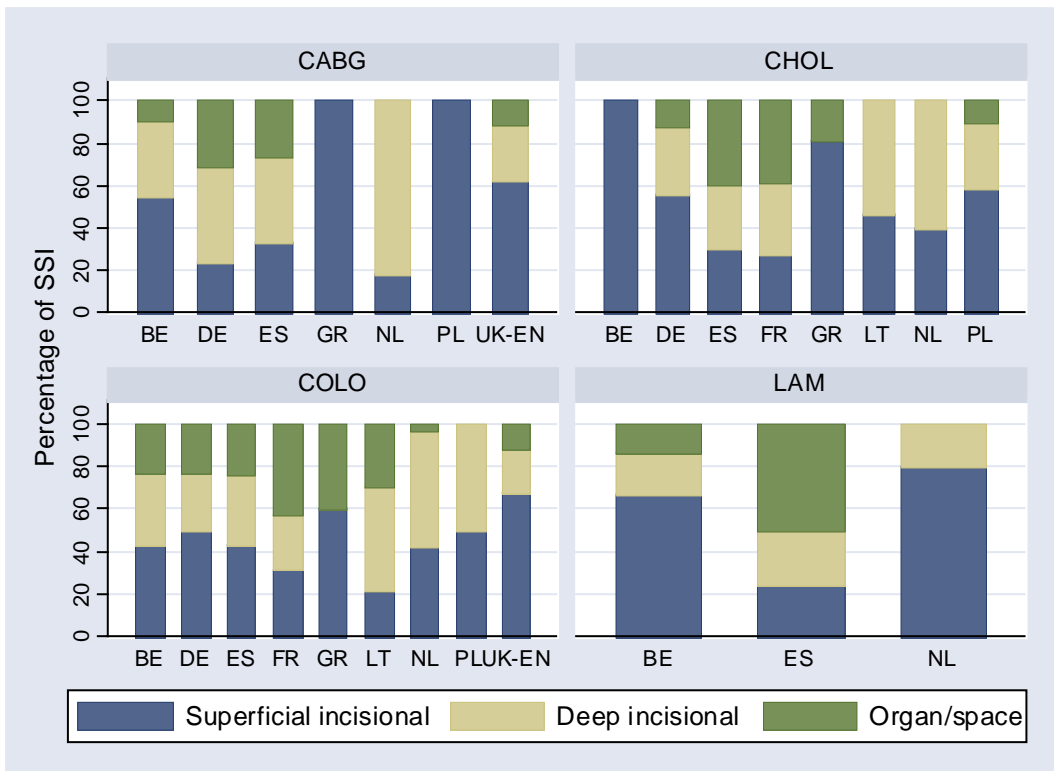


Figure 3.5C. Type of surgical site infections for CABG, CHOL, COLO and LAM by country, hospitals with ≥ 20 surgical procedures in category

Proportion of SSIs detected during post-discharge surveillance

As mentioned above, differences in the percentage of SSI may also arise from differences in post-discharge surveillance (30 days post-op exc. 1 year for HPRO). An indicator of this process is the proportion of SSI detected after discharge from the hospital and is shown in table 3.10. This table includes all known infections even in the absence of formal post-discharge surveillance.

Table 3.10. Percentage of SSI detected after discharge from the hospital

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UK-EN | UK-NI | UK-SC | UK-WA | Total |
|------|-----|----|-----|-----|-----|-----|----|------|----|-------|-------|-------|-------|-------|
| CABG | 21% | | 0% | | | | | 55% | | 0% | | | | 4% |
| CHOL | 0% | | 17% | | 43% | 88% | 7% | 40% | | | | | | 29% |
| COLO | 12% | | 6% | | 12% | 55% | 0% | 16% | | 0% | | | | 7% |
| CSEC | 33% | | 19% | | 31% | 75% | 0% | 64% | | | | 77% | | 49% |
| HPRO | 36% | | 7% | 44% | 44% | 50% | 0% | 28% | | 0% | 55% | 0% | 19% | 17% |
| LAM | 41% | | 25% | | | | | 100% | | | | | | 48% |

As expected, the overall percentage of SSI detected after discharge is the highest in surgical procedures with the shortest length of post-operative hospital stay (CSEC, LAM and CHOL). Table 3.10 also shows that the proportion of SSI detected post-discharge varies considerably between countries. Spain has lower post-discharge SSI rates overall compared to Belgium, Finland, France, Greece, the Netherlands and Northern Ireland, Wales and Scotland (for C-section).

In some countries such as England, post-discharge SSI are not reported as part of the surveillance system. In other countries where post-discharge surveillance is undertaken, variation in length of stay will affect the proportion of SSI detected after discharge, e.g. in Finland where patients are rapidly transferred to rehabilitation units. In addition, the sensitivity of case-finding post-discharge is likely to vary considerably according to the methods used within each country. In Germany and Poland, this indicator could not be computed because the date of discharge from the hospital was not available in these networks.

Distribution of isolated micro-organisms

Not all countries have information on micro-organisms responsible for SSI. Therefore no country comparisons are included in this analysis. An overview of micro-organisms detected is given in table 3.11.

Table 3.11. Distribution of micro-organisms isolated in infections for which at least one micro-organism was reported, pooled data from networks from BE, DE (only 2001), PL and UK-EN, 2000-2003

| | CABG | CHOL | COLO | CSEC | HPRO | Total |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Number of micro-organisms | 126 | 120 | 297 | 114 | 416 | 1074 |
| Gram-positive cocci | 81.7% | 38.3% | 28.6% | 76.3% | 71.2% | 57.4% |
| STAPHYLOCOCCUS AUREUS | 43.7% | 11.7% | 7.7% | 28.9% | 48.6% | 30.4% |
| COAGULASE-NEGATIVE STAFYLOCOCCI | 34.9% | 10.8% | 7.1% | 15.8% | 12.7% | 13.9% |
| STREPTOCOCCUS SPECIES | 2.4% | 0.8% | 6.1% | 9.6% | 2.4% | 4.0% |
| ENTEROCOCCUS SPECIES | 0.0% | 14.2% | 7.7% | 21.9% | 6.7% | 8.7% |
| OTHER GRAM POSITIVE COCCI | 0.8% | 0.8% | 0.0% | 0.0% | 0.7% | 0.5% |
| Gram-negative cocci | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Gram-positive bacilli | 0.0% | 0.0% | 0.3% | 3.5% | 2.6% | 1.5% |
| Gram-negative bacilli, enterobacteriaceae | 15.1% | 46.7% | 53.9% | 13.2% | 9.4% | 26.9% |
| CITROBACTER SPECIES | 2.4% | 0.8% | 1.0% | 0.0% | 0.2% | 0.7% |
| ENTEROBACTER SPECIES | 5.6% | 5.0% | 5.7% | 0.9% | 1.2% | 3.4% |
| ESCHERICHIA COLI | 1.6% | 28.3% | 34.0% | 8.8% | 2.9% | 14.8% |
| KLEBSIELLA SPECIES | 0.0% | 8.3% | 4.4% | 0.9% | 1.2% | 2.7% |
| PROTEUS SPECIES | 3.2% | 3.3% | 6.7% | 0.9% | 2.6% | 3.7% |
| SERRATIA SPECIES | 1.6% | 0.0% | 0.0% | 1.8% | 1.0% | 0.7% |
| OTHER ENTEROBACTERIACEAE | 0.8% | 0.8% | 2.0% | 0.0% | 0.2% | 0.8% |
| Gram-negative bacilli, non-enterobacteriaceae | 2.4% | 8.3% | 10.1% | 4.4% | 8.7% | 7.9% |
| ACINETOBACTER SPECIES | 0.0% | 5.0% | 1.3% | 0.9% | 1.7% | 1.8% |
| PSEUDOMONAS AERUGINOSA | 1.6% | 1.7% | 8.4% | 3.5% | 4.1% | 4.7% |
| STENOTROPHOMONAS MALTOPHILIA | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| PSEUDOMONADACEAE FAMILY, OTHER | 0.0% | 0.0% | 0.0% | 0.0% | 2.6% | 1.0% |
| HAEMOPHILUS SPECIES | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| LEGIONELLA SPECIES | 0.8% | 0.8% | 0.3% | 0.0% | 0.2% | 0.4% |
| OTH. NON ENTEROBACTERIACEAE | 0.0% | 0.8% | 0.0% | 0.0% | 0.0% | 0.1% |
| Anaerobic bacilli | 0.0% | 2.5% | 4.0% | 2.6% | 1.2% | 2.1% |
| BACTEROIDES SPECIES | 0.0% | 0.8% | 3.0% | 0.9% | 0.2% | 1.1% |
| OTHER ANAEROBES | 0.0% | 1.7% | 1.0% | 1.8% | 1.0% | 1.0% |
| Other bacteria | 0.0% | 0.0% | 0.0% | 0.0% | 6.7% | 2.6% |
| Fungi, parasites | 0.8% | 4.2% | 3.0% | 0.0% | 0.2% | 1.5% |
| CANDIDA SPECIES | 0.8% | 4.2% | 3.0% | 0.0% | 0.2% | 1.5% |
| ASPERGILLUS SPECIES | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| OTHER FUNGI / PARASITES | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

3.2.3 Incidence of infection

Two indicators are routinely calculated in Helics-SSI. The first is the crude percentage of operations resulting in an SSI, called the “cumulative incidence” of SSI in the 30 days (1 year for hip procedures) after operation, and is given in table 3.12. The second indicator is the number of first SSI per 1000 post-operative days at risk (i.e. without prior SSI) in the hospital, or the “incidence density” (table 3.13). In theory, the incidence density is the favored metric for the comparison of incidence between countries as it only uses the observations during the hospital stay in both numerator and denominator. However, it can only be calculated when the discharge date is known. Especially for the German data where no discharge dates are available, this is a problem because they are an important contributor to the database. Therefore, both indicators will be given in this report. Additional information showing more details can be found in the reference tables in the appendix.

As mentioned above, the incidence surgical site infections depends on a variety of factors other than quality of care: case mix (as reflected e.g. by the NNIS risk index and ICD-9-CM codes) and case selection (e.g. hospitals with problems in a certain category, or only patients admitted to the ICU), the overall sensitivity of surveillance (partly reflected by the proportion of superficial infections reported), the observation time in the hospital (length of post-operative hospital stay) and the intensity of post-discharge surveillance (as reflected by the % of infections detected after discharge).

Table 3.12. Cumulative incidence of registered surgical site infection by surgical procedure and country (only included when at least 150 operations performed)

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UKEN | UKNI | UKSC | UKWA | Total |
|------|------|------|-------|------|------|------|-------|------|------|------|------|------|------|-------|
| CABG | 1.8% | 2.7% | 6.0% | | | | | 2.1% | 1.9% | 2.9% | | | | 2.7% |
| CHOL | | 1.4% | 4.8% | | 1.1% | 7.2% | 1.7% | 1.0% | 1.3% | | | | | 1.4% |
| COLO | 5.9% | 6.4% | 21.6% | | 7.3% | | 22.0% | 8.6% | 5.2% | 8.6% | | | | 8.1% |
| CSEC | | 1.6% | 5.5% | | 2.1% | | 3.8% | 1.0% | 1.9% | | | 9.8% | | 2.1% |
| HPRO | 1.9% | | 3.1% | 4.0% | 1.3% | | 0.5% | 3.2% | | 2.8% | 0.9% | 2.0% | 3.0% | 2.7% |
| LAM | 0.8% | | 1.8% | | | | | 0.6% | | | | | | 0.8% |

CABG, CHOL, COLO, CSEC, LAM: SSI within 30 days after intervention; HPRO: SSI within 1 year after intervention; hospitals with less than 20 operations included

Table 3.13. Incidence density of in-hospital surgical site infections per 1000 post-operative patient-days at risk (without prior SSI) in the hospital, by surgical procedure and country (only included when at least 1000 post-operative hospital days)

| | BE | DE | ES | FI | FR | GR | LT | NL | PL | UKEN | UKNI | UKSC | UKWA | Total |
|------|-----|----|------|-----|-----|-----|------|------------------|----|------|------|------|------|-------|
| CABG | 1.4 | | 4.7 | | | | | 0.9 | | 3.0 | | | | 2.8 |
| CHOL | | | 6.3 | | 1.0 | | 2.6 | 1.8 | | | | | | 2.9 |
| COLO | 3.9 | | 17.3 | | 4.6 | 7.9 | 16.9 | 5.8 | | 6.9 | | | | 7.3 |
| CSEC | | | 7.1 | | 2.0 | | 5.4 | 0.7 | | | | 4.2 | | 3.8 |
| HPRO | 0.7 | | 2.4 | 2.5 | 0.5 | | 0.4 | 1.9 | | 2.0 | 0.5 | 1.9 | 1.8 | 1.8 |
| LAM | 0.6 | | 2.3 | | | | | 0.0 ¹ | | | | | | 0.6 |

CABG, CHOL, COLO, CSEC, LAM: SSI within 30 days after intervention; HPRO: SSI within 1 year after intervention; hospitals with less than 20 operations included

¹Only SSI after discharge

The first factor is partly dealt with by stratifying SSI rates according to the NNIS risk index. If ICD-9-CM codes are available, rates can further be fine-tuned according to the type of surgical procedure. Differences in post-discharge surveillance are accounted for in the SSI incidence density, which only looks at the number of infections detected during hospital stay (where case finding is probably more homogeneous) corrected for the duration of the observation (per 1000 post-operative patient-days in the hospital without prior infection). For instance, the registered cumulative incidence of SSI after caesarean section in Scotland was almost twice that of Spain (table 3.12), but the incidence density of in-hospital SSI in CSEC was lower in Scotland as compared to Spain (table 3.13), due to differences in post-discharge surveillance, as shown in table 3.10. For additional comparability, especially for those countries where discharge date is unknown, we also compared SSI rates in the first days after the operation; in theory these rates should be more comparable since most patients are still in hospitals in this period.

For Poland, where the discharge date is documented in only a small proportion of cases, an additional problem of information bias occurs (as documented in the reference tables where no minimal amount of post-operation days was required for inclusion): in patients with SSI the discharge date is more often documented, leading to very high incidence rates in those with a discharge date documented.

Validity and precision of incidence estimates

The estimates for the incidence of SSI given in the above tables have to be considered taking into account potential problems with validity and precision.

Potential problems concerning validity caused by information bias or selection bias have been mentioned previously. Registration practices differ by country, and even with the same registration protocol the practical application of the definitions of SSI may differ to some degree, for example for the definition of SSI type. Furthermore, the patient mix and indications for surgical interventions might not be homogeneous in all countries.

Precision problems occur when the numbers of observations is low. This should always be considered while interpreting results for individual hospitals but even at country level problems may occur due to a low SSI rate, a low number of observations or a combination of both. Precision can be described in the results using the confidence interval (CI) for the estimate. In this report we consistently use a 95 percent confidence interval. In the main incidence tables results were only shown when at least 150 surgical procedures were performed or when at least 1000 post-operative days at risk for that specific surgical procedures were available for analysis.

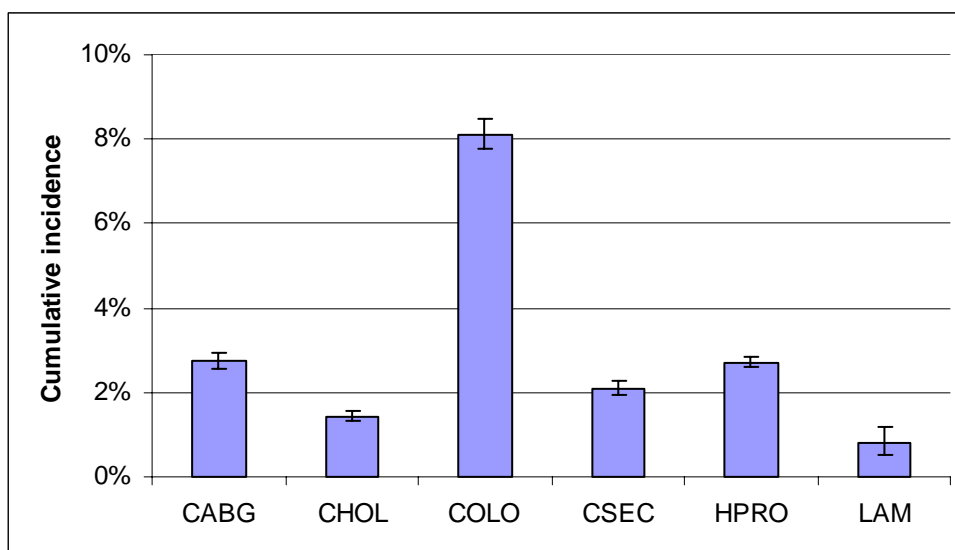


Figure 3.6A. Cumulative incidence or registered surgical site infection by surgical procedure (overall) and 95% confidence intervals

Figure 3.6 shows the overall cumulative incidence (A) and the incidence density (B) by surgical procedure together with the CI. It is clear that there are significant differences between SSI incidence in various surgical procedures, with colon surgery obviously carrying the highest infection risk, whichever metric used. The tables in the appendix give more details about the confidence intervals by country and the distribution of incidence within countries. Although some countries have significantly higher SSI rates for specific interventions, those results need to be interpreted with caution for reasons explained previously. Finally, for laminectomy, the absolute number of SSI is low due to a low SSI rate combined with a low number of registered operations leading to wide CIs.

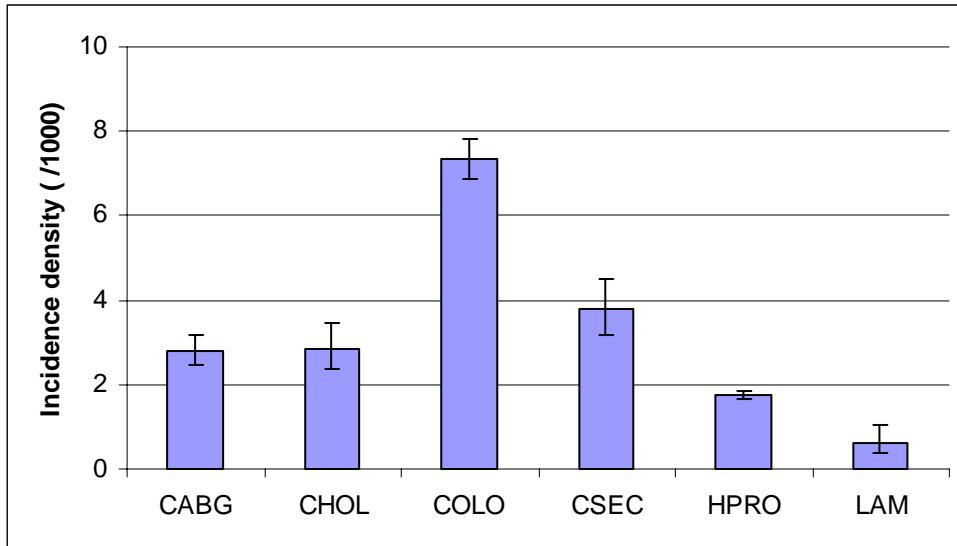


Figure 3.6B. Incidence density (/1000 patient-days) of registered surgical site infection by surgical procedure (overall) and 95% confidence intervals

SSI Incidence by NNIS risk index

For most surgical procedures the SSI incidence increases with increasing NNIS risk index, with the NNIS index unknown category holding an intermediate position. Figure 3.7 shows the cumulative incidence (A) and the incidence density (B) by NNIS risk index for different surgical procedures, including the 95% confidence intervals. More details about the incidence by NNIS risk index and by country can be found in the appendix.

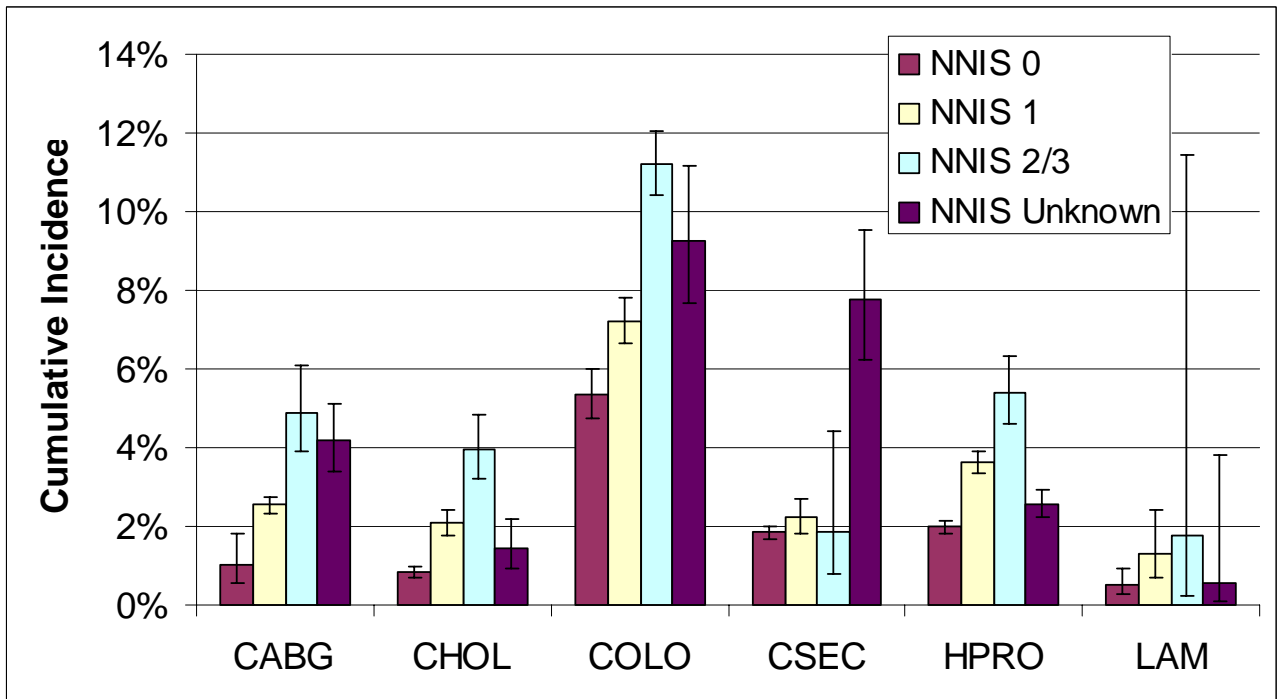


Figure 3.7A. Cumulative incidence (overall mean) of registered surgical site infection by NNIS risk index and surgical procedure (overall) and 95% confidence intervals

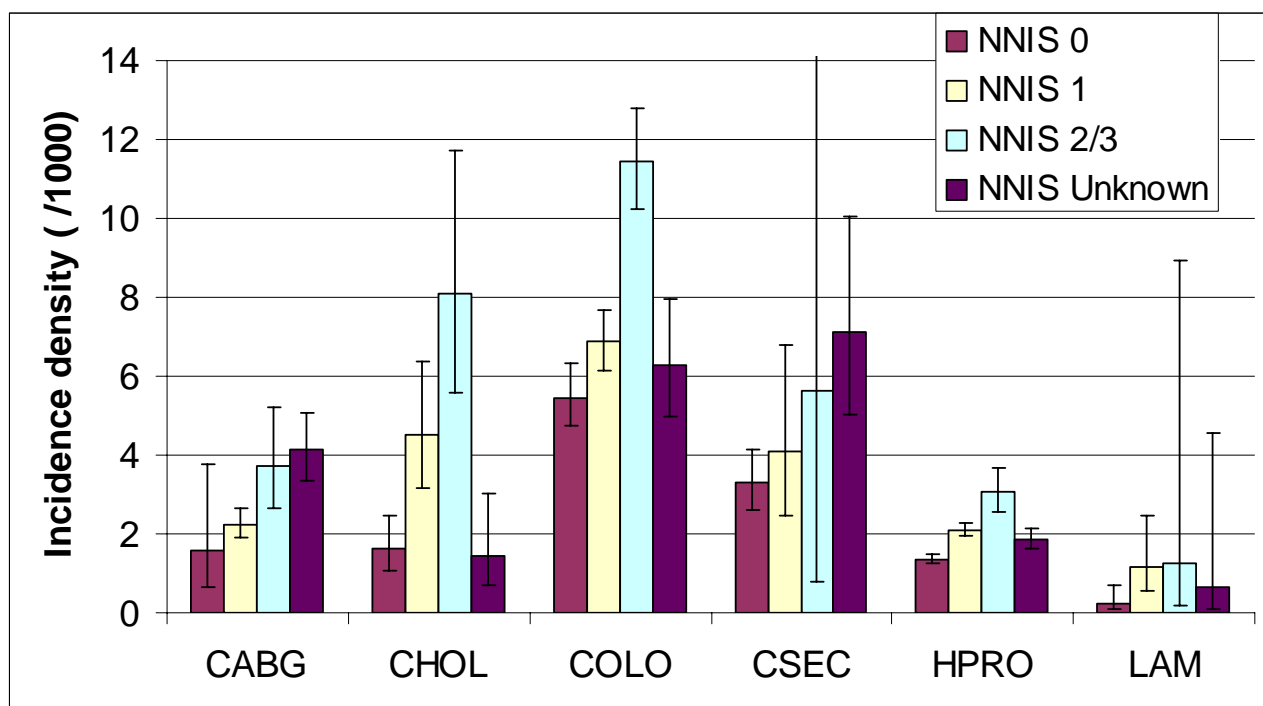


Figure 3.7B. Incidence density (overall mean) of registered surgical site infection by NNIS risk index and surgical procedure (overall) and 95% confidence intervals

Incidence differences within same NNIS surgical procedure category: HPRO

Even within one surgical procedure categories differences exists. In a previous chapter the example of hip arthroplasty was discussed and we showed that for partial hip replacement the patients were older and more ‘female’, probably reflecting a different indication for operation: hip fracture rather than osteoarthritis. We hypothesized that this might also be associated with different SSI risk, as was suggested previously (Ridgeway et al. Surgical Site Infection After Hip Arthroplasty, Bone & Joint, 2005). The reasons for this are thought to be a combination of the traumatic injury itself, and increased age and frailty leading to a higher a priori risk in patients undergoing partial hip replacements.

For those countries where ICD-9-CM codes were available we compared SSI rates for the different ICD categories within the HPRO group. While the cumulative incidence of SSI was 2.7% overall (table 3.12), this was 4.6% for the partial hip replacement group and only 2.0% in the total hip replacement group. Those differences were present in all countries and strongest in England. Part of the effect, however, is through length of stay and part of the effect disappears when incidence is expressed as incidence density: 2.2 vs. 1.6 /1000 hospital days at risk. With a longer length of stay the likelihood to detect SSI also increases. This analysis demonstrates the value of including more detailed information such as ICD codes in the surveillance.

SSI Incidence by duration of follow-up: time since operation

In the previous analyses we have considered the incidence of SSI within 30 days of the operation (1 year for HPRO), but otherwise regardless of the time after surgery. Implicitly this assumes that the infection rates would be constant over time. Most likely, however, they are not.

Additional analysis of the infection rates by time since surgery can help for a better understanding of the mechanisms and etiology of SSI. Figure 3.8 shows the overall SSI rate by days since operation, grouped in five-day periods. In this analysis we used all SSI reported whether they occurred in-hospital or after discharge. The incidence rates of SSI clearly show a peak between days 6 – 10 after operation, followed by a rapid decline thereafter. After 3 weeks incidence rates become very low. When analyzed separately by surgical procedure, colon surgery and CABG show a similar pattern as the overall SSI rate, while the other categories rather show a plateau on days 1-5 and then days 6-10 with a decline thereafter.

Since incidence rates are highest in the first two weeks after operation we looked more closely to this period in smaller time intervals. Figure 3.9A shows that the overall incidence rates really peaks at days 5-6 and declines thereafter, while in figure 9B it is shown that colon surgery has significantly higher SSI rates than the other surgical procedures at all times after operation.

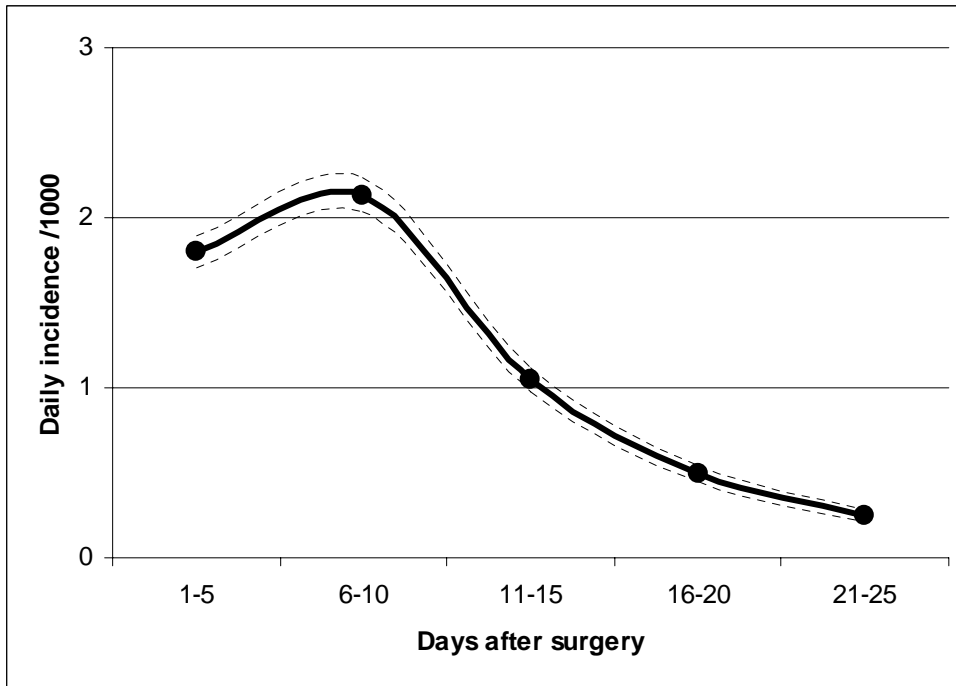


Figure 3.8. Overall incidence rate of registered surgical site infection, by number of days since surgical procedure and 95% confidence curves (dotted lines), in 5-day analysis periods and smoothed

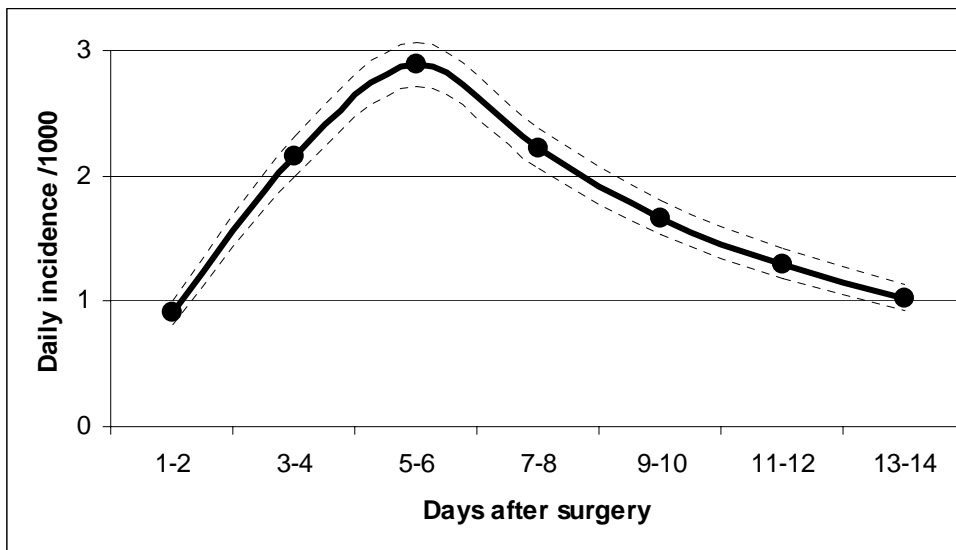


Figure 3.9A. Overall incidence rate of registered surgical site infection, by number of days since surgical procedure and 95% confidence curves (dotted lines), in 2-day analysis periods and smoothed

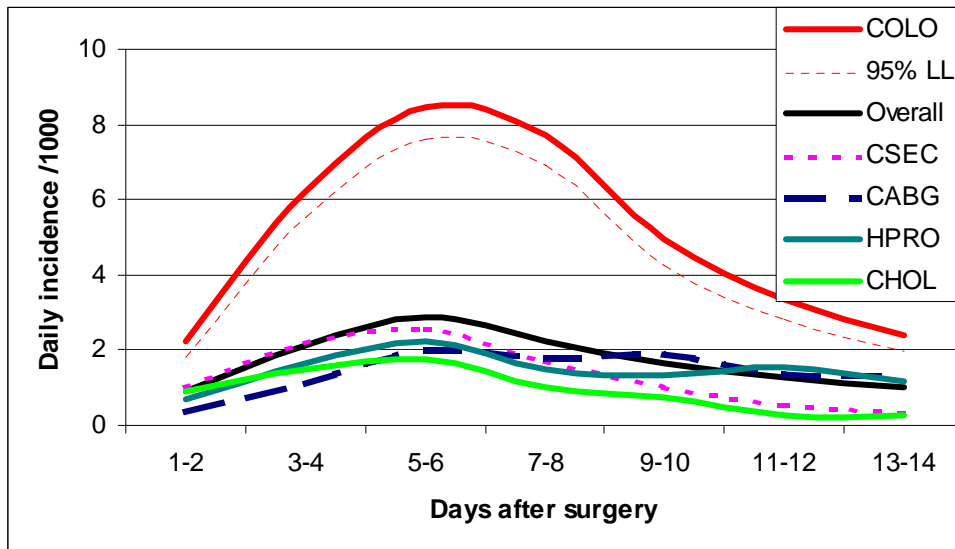


Figure 3.9B. Incidence rate of registered surgical site infection, by number of days since operation by surgical procedure category (in 2-day periods and smoothed)

Looking at infection rates in time slices after operation also allows for a better comparison between countries even with varying lengths of stay and varying methods (or absence) of post-discharge surveillance. In the first week after colon surgery most countries show a similar pattern of SSI rates, but some at a significantly higher level. As an example we show in figure 10 three examples of countries with higher than average rates shown in color (central estimate and 95% confidence bounds), with the Helics average rates shown in black. This figure also shows that, even with small numbers, significantly higher incidence rates of SSI can be detected with this analysis during the first week after operation.

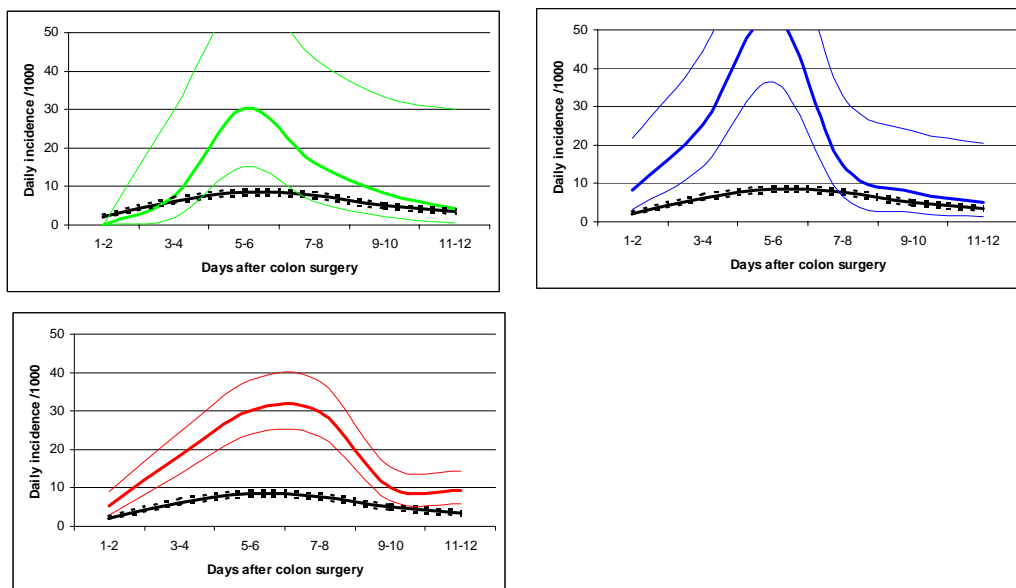


Figure 3.10. Incidence rate (and 95% confidence limits) of registered surgical site infection after colon surgery, by number of days since operation for selected countries with incidence rates higher than average (smoothed). Black lines indicate HELICS surveillance average for all countries(central estimate and 95% confidence limits); coloured lines indicate specific country estimate and 95% confidence limits.

4 Discussion

4.1 Quality of data

This report shows that SSI surveillance in different member states and comparison of the results across countries is feasible. The quality of the data obtained is sufficient for this surveillance to become a valuable tool to better understand the etiology of surgical site infections, to analyze the differences within and between countries, and to help in the search for better prevention methods in the future.

However, since many different systems are used for surveillance, common protocols with a strict adherence to definitions are needed for comparisons to become meaningful. This reports identified some areas where the quality of data, and especially the comparability could be enhanced. Expressed as a proportion of data available according to the HELICS protocol, we achieved a high degree of compatibility: approximately 90% for mandatory and required variables combined, and 76% for all variables including the optional variables. Of these variables, the most important are those that are needed for stratified comparison across countries according to the a priori risk. Wound contamination class and duration of the intervention are routinely available in most countries but ASA score is in sometimes partially or completely missing. This hampers meaningful comparisons when infection rates cannot be corrected for obvious confounding.

We observed some heterogeneity within NNIS procedure categories, but this could only be studied in those countries that supplied additional information, such as ICD-9-CM codes. A more generalized use of these codes (or codes that can be translated into common codes) would enhance comparability of data. Therefore, including those codes as 'required' rather than, as 'optional' variables would enhance future comparability of data.

Too few countries consistently reported the microorganisms held responsible for the SSI and therefore no meaningful comparisons between countries could be made for these microorganisms. Again, reporting of microorganisms was optional in the current protocol. If the comparison of microorganisms between countries is considered important, this variable should become a required.

To correct for the huge differences in post-discharge surveillance we also compared SSI incidence during the hospital stay. However, for an important contributor to the database (Germany) this was not possible since discharge date from the hospital were not available. For the other countries, with the exception of Poland, this variable was available in the vast majority of cases.

The data were gathered with different systems and this will most likely continue in the near future, especially for those countries with a long history of surveillance programs. However, for those countries that are starting up a surveillance system it would be preferable that a common software program would be used, based on the common HELICS protocol. The software system HELICS/WIN that was developed as part of the HELICS program could form the basis for this.

4.2 Results

We compiled SSI surveillance data from 170.000 surgical interventions, in 600 hospitals from 10 member states. For each of the surgical interventions studied, we observed few important differences in baseline population characteristics (age and gender) between the countries, as shown in the tables in chapter 3. There were some differences in the length of hospital stay after the operation but there was mainly a huge difference in the level of post-discharge surveillance of SSI, ranging from no post-discharge surveillance at all in some countries to post-discharge surveillance in the majority of interventions in some other countries (details in chapter 6). This of course has an important influence on the recorded incidence of SSI.

Apart from the expected differences in Risk Index (RI) by type of surgical intervention, important differences were observed between countries (figure 3.4). In addition to the expected differences by type of intervention, patients tended to have a higher RI in countries as Spain (and also Germany for colon surgery). Whether this is due to real differences in a priori risk or to a different interpretation of the same definitions for risk classification remains a question.

The type of SSI varied between countries as shown in figure 3.5. France reported the lowest proportion of superficial incisional infections, while in the Netherlands organ/space infections were rare. Again, whether those differences are real or artifactual is unknown at this moment. A comparison of the microorganisms involved in the infections was impossible since most countries did not report those.

For the incidence of SSI two indicators were used: the cumulative incidence (crude percentage of operations resulting in an SSI) and the incidence density (the number of first infections per 1000 post-operative patient days in hospital). The latter is the preferred metric for comparisons between countries as it uses the same observation time in both numerator and denominator and can therefore correct for differences in post-discharge surveillance. Unfortunately, however, it was not possible to calculate this indicator for an important proportion of the database, mainly due to the absence of length of stay information in Germany.

There were important and significant differences in infection rates between various surgical procedures and also between countries, as shown in figure 3.6 and in the tables in the appendix. The overall results also show a significant difference of infection rates by level of risk as expressed by the calculated NNIS Risk Index. The infection rates show a highly significant increase with increasing levels of baseline risk. For those interventions where no RI could be calculated, due to the lack of the necessary data, the infection rates were intermediate between rates at the lowest and at the highest risk, as would be expected.

To further compare the infection rates we added an analysis by time since surgical intervention for the first weeks after operation. This technique promises to be a valuable tool for the comparison of SSI rates between countries, even in the absence of post-discharge surveillance, because it can describe infection rates in the early days after operation when most of the patients are still within the hospital. Using this technique we detected important differences between countries (see chapter 6).

4.3 Recommendations for surveillance in Europe

The most important keys to success for making SSI surveillance in Europe comparable are in the use of common agreed protocols. This was achieved with the HELICS protocols. These protocols should further be enhanced, mainly by requiring a few additional variables as outlined in this report. The most important variables are: hospital discharge information, overall availability of the recommended data for risk stratification, the usage of more detailed ICD-9 or comparable procedure codes, and information on the micro-organisms involved.

4.4 Recommendations for future research and development

The use of common surveillance systems should be encouraged, especially in those member states that currently have no national or regional surveillance schemes. The HELICS/WIN software that was developed during the HELICS program could form the technical basis for this. Further research into the reasons behind the observed differences in SSI rates between countries should be encouraged.

At this moment, the time between data collection and analysis is quite long. A more streamlined flow of the data and an early and automated feedback system of the results back to the countries would greatly enhance both the participation in the surveillance and the usefulness of the results on the ground in the hospitals.

5 References

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6 Appendix: reference statistical tables

In the main part of the report we described the overall results of the Helics-SSI Surveillance for the years 2000 till 2003. In this appendix detailed information is provided. For the interpretation of these tables the same caution applies as for the rest of this report.

Tables 6.1 and 6.2 give the 95% confidence intervals for the data shown in table 3.12 and 3.13 from the main report.

Table 6.3 gives the distribution in percentiles of the cumulative incidence for each surgical procedure overall, and stratified by NNIS risk index for all countries combined. The mean gives the number of SSI divided by the number of operations and is therefore a weighted average, while the 'mean of means' gives the unweighted average of the means. Hospitals with less than 20 interventions for a given surgical procedure were excluded because they were considered to be less relevant for the description of the distribution. However, they were allowed to have less than 20 interventions in the risk-stratified analysis.

Table 6.4 gives similar information for the incidence density. The details per country are given in tables 6.5 to 10 for the distribution of the cumulative incidence and in tables 6.11 to 16 for the incidence density. It should be noted that the results in those tables are not limited to at least 150 operations or 1000 in hospital patient-days per country.

Table 6.1. Cumulative incidence (95% CI) of registered surgical site infection by surgical procedure and country (only included when at least 150 operations performed)

| | BE | DE | ES | FI | FR | GR | LT |
|------|-------------------|------------------|-------------------|------------------|-------------------|-------------------|---------------------|
| CABG | 1,8% (1 - 3,2) | 2,7% (2,5 - 2,9) | 6,0% (3,6 - 9,7) | | | | |
| CHOL | | 1,4% (1,2 - 1,5) | 4,8% (3,4 - 6,6) | | 1,1% (0,8 - 1,5) | 7,2% (4,5 - 11,5) | 1,7% (1 - 2,7) |
| COLO | 5,9% (4,9 - 7,2) | 6,4% (6 - 6,9) | 21,6% (19,4 - 24) | | 7,3% (6,3 - 8,4) | | 22,0% (17,3 - 27,7) |
| CSEC | | 1,6% (1,5 - 1,8) | 5,5% (3,8 - 7,9) | | 2,1% (1,5 - 2,9) | | 3,8% (2,4 - 6) |
| HPRO | 1,9% (1,4 - 2,5) | | 3,1% (2,3 - 4,1) | 4,0% (3,5 - 4,5) | 1,3% (1 - 1,6) | | 0,5% (0,1 - 3,1) |
| LAM | 0,8% (0,5 - 1,2) | | 1,8% (0,6 - 5,5) | | | | |
| | NL | PL | UKEN | UKNI | UKSC | UKWA | Total |
| CABG | 2,1% (1,1 - 3,7) | 1,9% (0,9 - 3,9) | 2,9% (2,5 - 3,3) | | | | 2,7% (2,5 - 2,9) |
| CHOL | 1,0% (0,6 - 1,8) | 1,3% (0,9 - 1,8) | | | | | 1,4% (1,3 - 1,6) |
| COLO | 8,6% (7,2 - 10,3) | 5,2% (3,8 - 7,3) | 8,6% (7,7 - 9,5) | | | | 8,1% (7,8 - 8,5) |
| CSEC | 1,0% (0,5 - 1,8) | 1,9% (1,3 - 2,9) | | | 9,8% (8,2 - 11,6) | | 2,1% (1,9 - 2,3) |
| HPRO | 3,2% (2,9 - 3,5) | | 2,8% (2,6 - 3) | 0,9% (0,6 - 1,3) | 2,0% (1,5 - 2,7) | 3,0% (2 - 4,5) | 2,7% (2,6 - 2,8) |
| LAM | 0,6% (0,2 - 1,4) | | | | | | 0,8% (0,5 - 1,2) |

Table 6.2. Incidence density (95% CI) of in-hospital surgical site infections per 1000 post-operative patient-days at risk in the hospital, by surgical procedure and country (only included when at least 1000 post-operative hospital days)

| | BE | DE | ES | FI | FR | GR | LT |
|------|-----------------|----|--------------------|-----------------|-----------------|------------------|--------------------|
| CABG | 1,4 (0,8 - 2,5) | | 4,7 (2,8 - 7,8) | | | | |
| CHOL | | | 6,3 (4,4 - 9) | | 1,0 (0,7 - 1,5) | | 2,6 (1,5 - 4,3) |
| COLO | 3,9 (3,1 - 4,8) | | 17,3 (15,3 - 19,4) | | 4,6 (3,9 - 5,4) | 7,9 (4,2 - 14,6) | 16,9 (12,9 - 22,7) |
| CSEC | | | 7,1 (4,7 - 10,7) | | 2,0 (1,4 - 2,9) | | 5,4 (3,3 - 8,6) |
| HPRO | 0,7 (0,5 - 1,1) | | 2,4 (1,7 - 3,2) | 2,5 (2,1 - 3,1) | 0,5 (0,4 - 0,8) | | 0,4 (0,1 - 2,6) |
| LAM | 0,6 (0,3 - 1,2) | | 2,3 (0,7 - 7) | | | | |
| | NL | PL | UKEN | UKNI | UKSC | UKWA | Total |
| CABG | 0,9 (0,4 - 2,1) | | 3,0 (2,6 - 3,4) | | | | 2,8 (2,5 - 3,2) |
| CHOL | 1,8 (0,8 - 4,1) | | | | | | 2,9 (2,4 - 3,5) |
| COLO | 5,8 (4,7 - 7,1) | | 6,9 (6,2 - 7,7) | | | | 7,3 (6,9 - 7,8) |
| CSEC | 0,7 (0,3 - 1,8) | | | | 4,2 (2,9 - 6,1) | | 3,8 (3,2 - 4,5) |
| HPRO | 1,9 (1,7 - 2,1) | | 2,0 (1,8 - 2,1) | 0,5 (0,3 - 0,9) | 1,9 (1,4 - 2,6) | 1,8 (1,1 - 2,8) | 1,8 (1,7 - 1,9) |
| LAM | | | | | | | 0,6 (0,4 - 1) |

Table 6.3. Distribution of the cumulative incidence of registered surgical site infection by surgical procedure and NNIS risk index

| | NNIS risk s | N Hosp operations | N of SSI | Mean | Mean of means | | | | | | |
|------|-------------|-------------------|----------|------|---------------|-------|------|------|------|-------|-------|
| | | | | | p10 | p25 | p50 | p75 | p90 | | |
| CABG | Overall | 36 | 28429 | 774 | 2.72 | 2.51 | 0.00 | 1.48 | 2.03 | 3.38 | 5.07 |
| | 0 | 28 | 1098 | 11 | 1.00 | 2.22 | 0.00 | 0.00 | 0.00 | 1.15 | 7.14 |
| | 1 | 34 | 23697 | 601 | 2.54 | 2.48 | 0.00 | 1.05 | 2.00 | 3.04 | 4.23 |
| | 2/3 | 34 | 1477 | 72 | 4.87 | 3.11 | 0.00 | 0.00 | 0.67 | 5.34 | 7.76 |
| | Unknown | 26 | 2157 | 90 | 4.17 | 6.43 | 0.00 | 0.00 | 0.00 | 1.26 | 6.00 |
| CHOL | Overall | 159 | 28890 | 410 | 1.42 | 1.31 | 0.00 | 0.00 | 0.33 | 1.96 | 4.23 |
| | 0 | 158 | 17598 | 144 | 0.82 | 0.52 | 0.00 | 0.00 | 0.00 | 0.57 | 1.61 |
| | 1 | 157 | 7537 | 156 | 2.07 | 2.18 | 0.00 | 0.00 | 0.00 | 1.69 | 6.67 |
| | 2/3 | 135 | 2224 | 88 | 3.96 | 5.03 | 0.00 | 0.00 | 0.00 | 2.96 | 16.67 |
| | Unknown | 33 | 1531 | 22 | 1.44 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 | 7.24 |
| COLO | Overall | 170 | 19166 | 1534 | 8.00 | 7.67 | 0.00 | 1.72 | 6.19 | 11.11 | 16.55 |
| | 0 | 158 | 4829 | 258 | 5.34 | 5.57 | 0.00 | 0.00 | 2.62 | 8.00 | 15.38 |
| | 1 | 168 | 7716 | 555 | 7.19 | 7.30 | 0.00 | 0.00 | 5.05 | 10.63 | 20.00 |
| | 2/3 | 160 | 5553 | 622 | 11.20 | 12.37 | 0.00 | 0.00 | 5.36 | 20.00 | 33.33 |
| | Unknown | 65 | 1068 | 99 | 9.27 | 8.45 | 0.00 | 0.00 | 0.00 | 8.33 | 20.00 |
| CSEC | Overall | 110 | 29704 | 625 | 2.10 | 2.21 | 0.00 | 0.00 | 0.94 | 3.26 | 6.13 |
| | 0 | 107 | 23725 | 437 | 1.84 | 2.87 | 0.00 | 0.00 | 0.69 | 2.63 | 7.14 |
| | 1 | 102 | 4691 | 104 | 2.22 | 3.43 | 0.00 | 0.00 | 0.00 | 3.03 | 9.52 |
| | 2/3 | 44 | 268 | 5 | 1.87 | 2.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Unknown | 37 | 1020 | 79 | 7.75 | 6.33 | 0.00 | 0.00 | 0.00 | 5.26 | 25.00 |
| HPRO | Overall | 265 | 58151 | 1589 | 2.73 | 2.51 | 0.00 | 0.00 | 1.85 | 3.99 | 6.06 |
| | 0 | 262 | 29029 | 576 | 1.98 | 1.88 | 0.00 | 0.00 | 0.79 | 3.03 | 5.41 |
| | 1 | 262 | 18117 | 654 | 3.61 | 3.18 | 0.00 | 0.00 | 0.76 | 5.26 | 9.43 |
| | 2/3 | 212 | 2705 | 146 | 5.40 | 6.57 | 0.00 | 0.00 | 0.00 | 2.33 | 16.67 |
| | Unknown | 151 | 8300 | 213 | 2.57 | 2.94 | 0.00 | 0.00 | 0.00 | 2.81 | 5.88 |
| LAM | Overall | 29 | 3025 | 22 | 0.73 | 0.81 | 0.00 | 0.00 | 0.00 | 1.40 | 2.63 |
| | 0 | 29 | 2026 | 10 | 0.49 | 0.57 | 0.00 | 0.00 | 0.00 | 0.00 | 2.56 |
| | 1 | 29 | 762 | 10 | 1.31 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 7.14 |
| | 2/3 | 16 | 57 | 1 | 1.75 | 1.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Unknown | 14 | 180 | 1 | 0.56 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

CABG, CHOL, COLO, CSEC, LAM: SSI within 30 days after intervention; HPRO: SSI within 1 year after intervention; hospitals with less than 20 operations of a specific type were excluded

Table 6.4. Distribution of the incidence density of in-hospital surgical site infections per 1000 post-operative patient-days in the hospital, by surgical procedure and NNIS risk index

| | NNIS risk index | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|------|-----------------|--------|--------------|--------------|--------------|---------------|------|------|------|-------|--------|
| CABG | Overall | 26 | 96616 | 268 | 2.77 | 3.11 | 0.00 | 0.80 | 2.04 | 3.34 | 5.87 |
| | 0 | 18 | 3201 | 5 | 1.56 | 2.97 | 0.00 | 0.00 | 0.00 | 0.00 | 15.15 |
| | 1 | 24 | 62737 | 140 | 2.23 | 10.34 | 0.00 | 0.69 | 1.65 | 3.32 | 5.65 |
| | 2/3 | 23 | 9097 | 34 | 3.74 | 2.43 | 0.00 | 0.00 | 0.00 | 5.21 | 6.99 |
| | Unknown | 19 | 21581 | 89 | 4.12 | 2.35 | 0.00 | 0.00 | 0.00 | 2.93 | 5.98 |
| CHOL | Overall | 102 | 29461 | 90 | 3.05 | 10.46 | 0.00 | 0.00 | 0.00 | 3.27 | 11.90 |
| | 0 | 101 | 14043 | 23 | 1.64 | 5.93 | 0.00 | 0.00 | 0.00 | 0.00 | 4.99 |
| | 1 | 100 | 7106 | 32 | 4.50 | 10.55 | 0.00 | 0.00 | 0.00 | 0.00 | 16.26 |
| | 2/3 | 78 | 3457 | 28 | 8.10 | 26.60 | 0.00 | 0.00 | 0.00 | 0.00 | 33.33 |
| | Unknown | 21 | 4855 | 7 | 1.44 | 18.78 | 0.00 | 0.00 | 0.00 | 9.37 | 50.00 |
| COLO | Overall | 128 | 116122 | 867 | 7.47 | 12.66 | 0.00 | 1.24 | 5.32 | 10.87 | 19.09 |
| | 0 | 118 | 33528 | 183 | 5.46 | 6.34 | 0.00 | 0.00 | 2.31 | 7.48 | 16.53 |
| | 1 | 126 | 44514 | 306 | 6.87 | 11.98 | 0.00 | 0.00 | 4.06 | 10.09 | 19.77 |
| | 2/3 | 118 | 26930 | 308 | 11.44 | 19.90 | 0.00 | 0.00 | 3.87 | 19.05 | 37.04 |
| | Unknown | 57 | 11150 | 70 | 6.28 | 13.32 | 0.00 | 0.00 | 2.59 | 7.04 | 23.81 |
| CSEC | Overall | 64 | 30915 | 122 | 3.95 | 16.50 | 0.00 | 0.00 | 2.29 | 5.79 | 31.58 |
| | 0 | 61 | 22567 | 74 | 3.28 | 10.50 | 0.00 | 0.00 | 0.97 | 3.85 | 11.35 |
| | 1 | 57 | 3673 | 15 | 4.08 | 7.88 | 0.00 | 0.00 | 0.00 | 0.00 | 21.28 |
| | 2/3 | 11 | 178 | 1 | 5.62 | 9.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Unknown | 21 | 4497 | 32 | 7.12 | 32.68 | 0.00 | 0.00 | 4.63 | 31.25 | 100.00 |
| HPRO | Overall | 265 | 720292 | 1289 | 1.79 | 1.49 | 0.00 | 0.00 | 1.01 | 2.31 | 3.82 |
| | 0 | 262 | 324621 | 442 | 1.36 | 1.20 | 0.00 | 0.00 | 0.00 | 1.85 | 3.84 |
| | 1 | 262 | 251170 | 531 | 2.11 | 1.75 | 0.00 | 0.00 | 0.00 | 2.61 | 5.99 |
| | 2/3 | 212 | 38277 | 118 | 3.08 | 4.55 | 0.00 | 0.00 | 0.00 | 0.00 | 8.35 |
| | Unknown | 151 | 106224 | 198 | 1.86 | 2.52 | 0.00 | 0.00 | 0.00 | 1.75 | 4.78 |
| LAM | Overall | 29 | 21399 | 12 | 0.56 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 2.31 |
| | 0 | 29 | 13118 | 3 | 0.23 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 2.24 |
| | 1 | 29 | 5932 | 7 | 1.18 | 0.76 | 0.00 | 0.00 | 0.00 | 0.00 | 5.41 |
| | 2/3 | 16 | 794 | 1 | 1.26 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Unknown | 14 | 1555 | 1 | 0.64 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

CABG, CHOL, COLO, CSEC, LAM: SSI within 30 days after intervention; HPRO: SSI within 1 year after intervention; hospitals with less than 20 operations of a specific type were excluded

Table 6.5. Distribution of the cumulative incidence of surgical site infection (within 30 days after operation) in coronary artery bypass grafting (CABG=CBGB+CBGC), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 | |
|----------------------------|-------------------|--------------|------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|
| All risk categories | | | | | | | | | | |
| BE | 6 | 610 | 8 | 1.31 | 1.20 | 0.00 | 0.00 | 0.76 | 2.00 | 3.70 |
| DE | 10 | 18645 | 504 | 2.70 | 2.64 | 0.95 | 1.87 | 3.06 | 3.39 | 3.94 |
| ES | 3 | 240 | 15 | 6.25 | 5.64 | 1.79 | 1.79 | 7.50 | 7.64 | 7.64 |
| GR | 1 | 48 | 0 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 2 | 536 | 11 | 2.05 | 1.82 | 1.14 | 1.14 | 1.82 | 2.50 | 2.50 |
| PL | 1 | 363 | 7 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 |
| UKEN | 13 | 7987 | 229 | 2.87 | 2.63 | 1.07 | 1.70 | 2.34 | 3.00 | 5.07 |
| Total | 36 | 28429 | 774 | 2.72 | 2.51 | 0.00 | 1.48 | 2.03 | 3.38 | 5.07 |
| Risk Index 0 | | | | | | | | | | |
| BE | 5 | 141 | 1 | 0.71 | 1.43 | 0.00 | 0.00 | 0.00 | 0.00 | 7.14 |
| DE | 9 | 805 | 6 | 0.75 | 1.59 | 0.00 | 0.00 | 0.00 | 2.22 | 7.14 |
| ES | 2 | 20 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 1 | 18 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKEN | 11 | 114 | 4 | 3.51 | 3.69 | 0.00 | 0.00 | 0.00 | 2.00 | 10.00 |
| Total | 28 | 1098 | 11 | 1.00 | 2.22 | 0.00 | 0.00 | 0.00 | 1.15 | 7.14 |
| Risk Index 1 | | | | | | | | | | |
| BE | 6 | 379 | 6 | 1.58 | 1.36 | 0.00 | 0.00 | 0.98 | 1.96 | 4.23 |
| DE | 10 | 17048 | 458 | 2.69 | 2.54 | 0.94 | 1.78 | 2.97 | 3.25 | 3.81 |
| ES | 3 | 93 | 6 | 6.45 | 7.70 | 2.33 | 2.33 | 7.14 | 13.64 | 13.64 |
| NL | 2 | 516 | 11 | 2.13 | 1.89 | 1.17 | 1.17 | 1.89 | 2.61 | 2.61 |
| PL | 1 | 331 | 1 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| UKEN | 12 | 5330 | 119 | 2.23 | 1.97 | 0.78 | 0.93 | 2.00 | 2.58 | 4.00 |
| Total | 34 | 23697 | 601 | 2.54 | 2.48 | 0.00 | 1.05 | 2.00 | 3.04 | 4.23 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 6 | 68 | 1 | 1.47 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 | 3.57 |
| DE | 10 | 774 | 39 | 5.04 | 3.75 | 0.00 | 0.00 | 2.63 | 5.77 | 12.50 |
| ES | 3 | 127 | 9 | 7.09 | 2.59 | 0.00 | 0.00 | 0.00 | 7.76 | 7.76 |
| NL | 2 | 17 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKEN | 12 | 490 | 23 | 4.69 | 4.51 | 0.00 | 0.67 | 4.28 | 7.60 | 7.69 |
| Total | 34 | 1477 | 72 | 4.87 | 3.11 | 0.00 | 0.00 | 0.67 | 5.34 | 7.76 |
| Risk Index unknown | | | | | | | | | | |
| BE | 2 | 22 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DE | 7 | 18 | 1 | 5.56 | 14.29 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| GR | 1 | 48 | 0 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 2 | 3 | 0 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 1 | 13 | 6 | 46.15 | 46.15 | 46.15 | 46.15 | 46.15 | 46.15 | 46.15 |
| UKEN | 13 | 2053 | 83 | 4.04 | 1.61 | 0.00 | 0.00 | 0.00 | 3.01 | 5.56 |
| Total | 26 | 2157 | 90 | 4.17 | 6.43 | 0.00 | 0.00 | 0.00 | 1.26 | 6.00 |

Table 6.6. Distribution of the cumulative incidence of surgical site infection (within 30 days after operation) in cholecystectomy (CHOL), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 |
|----------------------------|-------------------|--------------|------------|-------------|---------------|-------------|-------------|-------------|-------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 2 | 100 | 2 | 2.00 | 2.74 | 1.32 | 1.32 | 2.74 | 4.17 | 4.17 |
| DE | 57 | 21007 | 283 | 1.35 | 1.30 | 0.00 | 0.35 | 0.87 | 1.83 | 2.89 |
| ES | 8 | 679 | 32 | 4.71 | 3.50 | 0.00 | 0.00 | 3.37 | 6.41 | 8.40 |
| FR | 61 | 2166 | 17 | 0.78 | 0.84 | 0.00 | 0.00 | 0.00 | 0.00 | 3.92 |
| GR | 1 | 221 | 16 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 |
| LT | 5 | 958 | 14 | 1.46 | 2.15 | 0.00 | 0.25 | 0.49 | 4.44 | 5.56 |
| NL | 6 | 1077 | 11 | 1.02 | 1.43 | 0.00 | 0.00 | 0.30 | 2.72 | 5.26 |
| PL | 19 | 2682 | 35 | 1.30 | 1.23 | 0.00 | 0.00 | 0.33 | 2.40 | 4.94 |
| Total | 159 | 28890 | 410 | 1.42 | 1.31 | 0.00 | 0.00 | 0.33 | 1.96 | 4.23 |
| Risk Index 0 | | | | | | | | | | |
| BE | 2 | 55 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DE | 57 | 13088 | 111 | 0.85 | 0.62 | 0.00 | 0.00 | 0.45 | 1.05 | 1.76 |
| ES | 8 | 411 | 9 | 2.19 | 1.40 | 0.00 | 0.00 | 0.00 | 2.59 | 6.02 |
| FR | 61 | 1487 | 3 | 0.20 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 5 | 460 | 6 | 1.30 | 1.30 | 0.00 | 0.00 | 0.00 | 1.54 | 4.95 |
| NL | 6 | 473 | 6 | 1.27 | 0.85 | 0.00 | 0.00 | 0.46 | 1.61 | 2.58 |
| PL | 19 | 1624 | 9 | 0.55 | 0.41 | 0.00 | 0.00 | 0.00 | 0.59 | 1.30 |
| Total | 158 | 17598 | 144 | 0.82 | 0.52 | 0.00 | 0.00 | 0.00 | 0.57 | 1.61 |
| Risk Index 1 | | | | | | | | | | |
| BE | 2 | 26 | 1 | 3.85 | 8.33 | 0.00 | 0.00 | 8.33 | 16.67 | 16.67 |
| DE | 57 | 6049 | 117 | 1.93 | 2.11 | 0.00 | 0.00 | 0.98 | 3.37 | 5.00 |
| ES | 8 | 203 | 12 | 5.91 | 3.75 | 0.00 | 0.00 | 0.76 | 7.79 | 12.90 |
| FR | 60 | 496 | 8 | 1.61 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 | 3.77 |
| LT | 5 | 87 | 3 | 3.45 | 3.37 | 0.00 | 0.00 | 0.00 | 4.35 | 12.50 |
| NL | 6 | 69 | 4 | 5.80 | 6.17 | 0.00 | 0.00 | 0.00 | 3.70 | 33.33 |
| PL | 19 | 607 | 11 | 1.81 | 1.59 | 0.00 | 0.00 | 0.00 | 4.26 | 6.78 |
| Total | 157 | 7537 | 156 | 2.07 | 2.18 | 0.00 | 0.00 | 0.00 | 1.69 | 6.67 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 1 | 5 | 1 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 |
| DE | 57 | 1831 | 55 | 3.00 | 2.74 | 0.00 | 0.00 | 0.00 | 3.17 | 10.00 |
| ES | 7 | 65 | 11 | 16.92 | 21.99 | 0.00 | 0.00 | 16.67 | 40.00 | 42.86 |
| FR | 45 | 179 | 6 | 3.35 | 2.48 | 0.00 | 0.00 | 0.00 | 0.00 | 9.09 |
| LT | 3 | 17 | 3 | 17.65 | 16.07 | 0.00 | 7.14 | 15.48 | 25.00 | 33.33 |
| NL | 4 | 12 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 18 | 115 | 12 | 10.43 | 11.22 | 0.00 | 0.00 | 0.00 | 16.67 | 33.33 |
| Total | 135 | 2224 | 88 | 3.96 | 5.03 | 0.00 | 0.00 | 0.00 | 2.96 | 16.67 |
| Risk Index unknown | | | | | | | | | | |
| BE | 2 | 14 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DE | 12 | 39 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 1 | 4 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 221 | 16 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 | 7.24 |
| LT | 4 | 394 | 2 | 0.51 | 1.54 | 0.00 | 0.00 | 0.13 | 3.08 | 5.88 |
| NL | 3 | 523 | 1 | 0.19 | 0.09 | 0.00 | 0.00 | 0.00 | 0.28 | 0.28 |
| PL | 10 | 336 | 3 | 0.89 | 7.00 | 0.00 | 0.00 | 0.00 | 16.67 | 26.67 |
| Total | 33 | 1531 | 22 | 1.44 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 | 7.24 |

Table 6.7. Distribution of the cumulative incidence of surgical site infection (Within 30 days after operation) in colon surgery (COLO), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 | |
|----------------------------|-------------------|--------------|-------------|---------------|--------------|-------------|-------------|-------------|--------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 30 | 1405 | 73 | 5.20 | 5.61 | 0.00 | 0.00 | 4.11 | 9.09 | 12.70 |
| DE | 42 | 9593 | 617 | 6.43 | 6.27 | 1.00 | 3.18 | 5.06 | 8.06 | 15.40 |
| ES | 12 | 1188 | 264 | 22.22 | 20.35 | 14.29 | 15.12 | 19.42 | 26.11 | 28.04 |
| FR | 27 | 1187 | 61 | 5.14 | 5.69 | 0.00 | 0.00 | 2.80 | 7.50 | 16.67 |
| GR | 1 | 135 | 22 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 |
| LT | 3 | 218 | 49 | 22.48 | 19.19 | 10.42 | 10.42 | 20.00 | 27.14 | 27.14 |
| NL | 15 | 1199 | 100 | 8.34 | 7.04 | 1.54 | 2.94 | 8.60 | 10.87 | 12.07 |
| PL | 12 | 574 | 31 | 5.40 | 4.99 | 0.00 | 0.00 | 1.82 | 9.65 | 14.29 |
| UKEN | 28 | 3667 | 317 | 8.64 | 8.39 | 0.46 | 6.10 | 7.81 | 11.37 | 16.30 |
| Total | 170 | 19166 | 1534 | 8.00 | 7.67 | 0.00 | 1.72 | 6.19 | 11.11 | 16.55 |
| Risk Index 0 | | | | | | | | | | |
| BE | 28 | 450 | 23 | 5.11 | 7.76 | 0.00 | 0.00 | 1.19 | 12.13 | 33.33 |
| DE | 40 | 1766 | 59 | 3.34 | 3.42 | 0.00 | 0.00 | 2.42 | 5.22 | 7.95 |
| ES | 8 | 211 | 44 | 20.85 | 19.31 | 7.14 | 16.58 | 20.58 | 23.11 | 26.83 |
| FR | 27 | 429 | 8 | 1.86 | 1.98 | 0.00 | 0.00 | 0.00 | 1.59 | 10.00 |
| LT | 3 | 41 | 12 | 29.27 | 17.55 | 0.00 | 0.00 | 18.18 | 34.48 | 34.48 |
| NL | 15 | 511 | 34 | 6.65 | 6.06 | 0.00 | 0.00 | 5.26 | 10.91 | 14.29 |
| PL | 10 | 153 | 4 | 2.61 | 2.01 | 0.00 | 0.00 | 0.00 | 0.00 | 10.03 |
| UKEN | 27 | 1268 | 74 | 5.84 | 5.70 | 0.00 | 2.67 | 4.88 | 9.09 | 13.33 |
| Total | 158 | 4829 | 258 | 5.34 | 5.57 | 0.00 | 0.00 | 2.62 | 8.00 | 15.38 |
| Risk Index 1 | | | | | | | | | | |
| BE | 30 | 546 | 26 | 4.76 | 5.71 | 0.00 | 0.00 | 3.21 | 7.69 | 16.03 |
| DE | 42 | 4179 | 236 | 5.65 | 5.71 | 0.00 | 1.98 | 4.12 | 7.69 | 11.11 |
| ES | 12 | 430 | 93 | 21.63 | 20.47 | 10.34 | 12.73 | 18.18 | 27.67 | 36.00 |
| FR | 27 | 500 | 21 | 4.20 | 4.43 | 0.00 | 0.00 | 2.27 | 8.00 | 10.00 |
| LT | 3 | 73 | 17 | 23.29 | 15.60 | 0.00 | 0.00 | 23.08 | 23.73 | 23.73 |
| NL | 15 | 375 | 32 | 8.53 | 6.89 | 0.00 | 0.00 | 6.67 | 11.36 | 13.33 |
| PL | 11 | 234 | 11 | 4.70 | 4.64 | 0.00 | 0.00 | 0.00 | 5.56 | 19.35 |
| UKEN | 28 | 1379 | 119 | 8.63 | 8.90 | 0.00 | 5.15 | 8.37 | 13.04 | 18.18 |
| Total | 168 | 7716 | 555 | 7.19 | 7.30 | 0.00 | 0.00 | 5.05 | 10.63 | 20.00 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 28 | 275 | 18 | 6.55 | 8.49 | 0.00 | 0.00 | 0.00 | 10.00 | 33.33 |
| DE | 42 | 3596 | 309 | 8.59 | 10.79 | 0.00 | 0.00 | 6.38 | 14.46 | 33.33 |
| ES | 12 | 545 | 127 | 23.30 | 24.27 | 0.00 | 12.12 | 25.00 | 33.33 | 40.00 |
| FR | 24 | 248 | 32 | 12.90 | 12.81 | 0.00 | 0.00 | 0.00 | 19.60 | 40.00 |
| LT | 3 | 53 | 13 | 24.53 | 20.69 | 0.00 | 12.22 | 24.72 | 29.17 | 33.33 |
| NL | 12 | 126 | 21 | 16.67 | 8.57 | 0.00 | 0.00 | 0.00 | 19.38 | 23.08 |
| PL | 12 | 134 | 12 | 8.96 | 7.68 | 0.00 | 0.00 | 0.00 | 20.00 | 25.00 |
| UKEN | 27 | 576 | 90 | 15.63 | 14.67 | 0.00 | 0.00 | 9.17 | 22.22 | 40.00 |
| Total | 160 | 5553 | 622 | 11.20 | 12.37 | 0.00 | 0.00 | 5.36 | 20.00 | 33.33 |
| Risk Index unknown | | | | | | | | | | |
| BE | 13 | 134 | 6 | 4.48 | 11.31 | 0.00 | 0.00 | 0.00 | 4.35 | 33.33 |
| DE | 8 | 52 | 13 | 25.00 | 4.51 | 0.00 | 0.00 | 0.00 | 0.00 | 36.11 |
| ES | 1 | 2 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 3 | 10 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 135 | 22 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 | 16.30 |
| LT | 3 | 51 | 7 | 13.73 | 25.93 | 0.00 | 0.00 | 11.11 | 66.67 | 66.67 |
| NL | 7 | 187 | 13 | 6.95 | 3.65 | 0.00 | 0.00 | 0.00 | 7.14 | 11.76 |
| PL | 4 | 53 | 4 | 7.55 | 24.58 | 0.00 | 3.33 | 15.83 | 45.83 | 66.67 |
| UKEN | 25 | 444 | 34 | 7.66 | 5.92 | 0.00 | 0.00 | 4.76 | 10.00 | 16.67 |
| Total | 65 | 1068 | 99 | 9.27 | 8.45 | 0.00 | 0.00 | 0.00 | 8.33 | 20.00 |

Table 6.8. Distribution of the cumulative incidence of surgical site infection (within 30 days after operation) in caesarean section (CSEC), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 |
|----------------------------|-------------------|--------------|------------|-------------|---------------|-------------|-------------|-------------|-------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 1 | 86 | 9 | 10.47 | 10.47 | 10.47 | 10.47 | 10.47 | 10.47 | 10.47 |
| DE | 46 | 23814 | 386 | 1.62 | 1.25 | 0.00 | 0.27 | 0.84 | 1.61 | 3.02 |
| ES | 4 | 477 | 26 | 5.45 | 3.74 | 0.00 | 2.02 | 4.24 | 5.46 | 6.47 |
| FR | 29 | 1474 | 33 | 2.24 | 2.42 | 0.00 | 0.00 | 1.64 | 3.70 | 8.00 |
| GR | 1 | 36 | 3 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 |
| LT | 4 | 451 | 17 | 3.77 | 3.36 | 0.00 | 1.64 | 3.81 | 5.07 | 5.80 |
| NL | 5 | 1030 | 10 | 0.97 | 0.66 | 0.00 | 0.00 | 0.49 | 0.85 | 1.94 |
| PL | 15 | 1145 | 22 | 1.92 | 1.51 | 0.00 | 0.00 | 0.00 | 2.94 | 3.49 |
| UKSC | 5 | 1191 | 119 | 9.99 | 8.42 | 0.00 | 3.26 | 7.44 | 14.47 | 16.95 |
| Total | 110 | 29704 | 625 | 2.10 | 2.21 | 0.00 | 0.00 | 0.94 | 3.26 | 6.13 |
| Risk Index 0 | | | | | | | | | | |
| BE | 1 | 55 | 7 | 12.73 | 12.73 | 12.73 | 12.73 | 12.73 | 12.73 | 12.73 |
| DE | 46 | 19687 | 301 | 1.53 | 1.13 | 0.00 | 0.00 | 0.70 | 1.85 | 2.86 |
| ES | 4 | 333 | 19 | 5.71 | 3.89 | 0.00 | 1.28 | 3.91 | 6.50 | 7.73 |
| FR | 29 | 1268 | 25 | 1.97 | 2.07 | 0.00 | 0.00 | 0.00 | 2.78 | 7.50 |
| LT | 4 | 371 | 15 | 4.04 | 3.55 | 0.00 | 1.78 | 4.02 | 5.32 | 6.15 |
| NL | 5 | 932 | 9 | 0.97 | 0.62 | 0.00 | 0.00 | 0.00 | 1.12 | 1.98 |
| PL | 13 | 617 | 10 | 1.62 | 8.40 | 0.00 | 0.00 | 0.00 | 0.00 | 8.43 |
| UKSC | 5 | 462 | 51 | 11.04 | 8.02 | 0.00 | 2.86 | 10.96 | 11.76 | 14.52 |
| Total | 107 | 23725 | 437 | 1.84 | 2.87 | 0.00 | 0.00 | 0.69 | 2.63 | 7.14 |
| Risk Index 1 | | | | | | | | | | |
| BE | 1 | 16 | 1 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 | 6.25 |
| DE | 45 | 3857 | 81 | 2.10 | 3.52 | 0.00 | 0.00 | 1.09 | 3.57 | 9.09 |
| ES | 4 | 140 | 7 | 5.00 | 3.51 | 0.00 | 0.00 | 2.25 | 7.01 | 9.52 |
| FR | 28 | 193 | 7 | 3.63 | 3.89 | 0.00 | 0.00 | 0.00 | 0.00 | 16.67 |
| LT | 4 | 58 | 1 | 1.72 | 0.56 | 0.00 | 0.00 | 0.00 | 1.11 | 2.22 |
| NL | 5 | 70 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 11 | 320 | 1 | 0.31 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKSC | 4 | 37 | 6 | 16.22 | 13.94 | 0.00 | 4.17 | 12.50 | 23.72 | 30.77 |
| Total | 102 | 4691 | 104 | 2.22 | 3.43 | 0.00 | 0.00 | 0.00 | 3.03 | 9.52 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DE | 29 | 239 | 4 | 1.67 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 1 | 4 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 6 | 9 | 1 | 11.11 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| LT | 1 | 2 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 4 | 11 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKSC | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 44 | 268 | 5 | 1.87 | 2.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Risk Index unknown | | | | | | | | | | |
| BE | 1 | 14 | 1 | 7.14 | 7.14 | 7.14 | 7.14 | 7.14 | 7.14 | 7.14 |
| DE | 16 | 31 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 2 | 4 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 36 | 3 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 | 8.33 |
| LT | 2 | 20 | 1 | 5.00 | 2.63 | 0.00 | 0.00 | 2.63 | 5.26 | 5.26 |
| NL | 3 | 27 | 1 | 3.70 | 8.33 | 0.00 | 0.00 | 0.00 | 25.00 | 25.00 |
| PL | 7 | 197 | 11 | 5.58 | 19.93 | 0.00 | 0.00 | 3.26 | 50.00 | 50.00 |
| UKSC | 5 | 691 | 62 | 8.97 | 9.82 | 0.00 | 0.00 | 7.03 | 21.00 | 21.05 |
| Total | 37 | 1020 | 79 | 7.75 | 6.33 | 0.00 | 0.00 | 0.00 | 5.26 | 25.00 |

Table 6.9. Distribution of the cumulative incidence of surgical site infection (within 1 year after operation) in hip arthroplasty (HPRO), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 | |
|----------------------------|-------------------|--------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 38 | 2339 | 46 | 1.97 | 2.40 | 0.00 | 0.00 | 1.28 | 4.00 | 9.09 |
| ES | 13 | 1354 | 42 | 3.10 | 3.36 | 0.00 | 1.00 | 1.32 | 3.85 | 10.53 |
| FI | 8 | 5288 | 210 | 3.97 | 3.43 | 0.54 | 1.58 | 2.56 | 4.72 | 9.18 |
| FR | 70 | 3414 | 39 | 1.14 | 1.18 | 0.00 | 0.00 | 0.00 | 1.85 | 4.38 |
| GR | 1 | 33 | 2 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 |
| LT | 2 | 202 | 1 | 0.50 | 0.43 | 0.00 | 0.00 | 0.43 | 0.86 | 0.86 |
| NL | 40 | 13596 | 429 | 3.16 | 3.44 | 0.59 | 1.49 | 2.56 | 4.54 | 7.21 |
| UKEN | 90 | 26598 | 735 | 2.76 | 2.98 | 0.10 | 1.20 | 2.53 | 4.33 | 6.20 |
| UKNI | 1 | 2571 | 22 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| UKSC | 1 | 1997 | 40 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| UKWA | 1 | 759 | 23 | 3.03 | 3.03 | 3.03 | 3.03 | 3.03 | 3.03 | 3.03 |
| Total | 265 | 58151 | 1589 | 2.73 | 2.51 | 0.00 | 0.00 | 1.85 | 3.99 | 6.06 |
| Risk Index 0 | | | | | | | | | | |
| BE | 37 | 1055 | 19 | 1.80 | 1.99 | 0.00 | 0.00 | 0.00 | 3.85 | 6.67 |
| ES | 13 | 427 | 9 | 2.11 | 2.51 | 0.00 | 0.00 | 0.00 | 2.63 | 11.11 |
| FI | 8 | 1313 | 39 | 2.97 | 2.28 | 0.00 | 0.25 | 2.04 | 4.15 | 5.35 |
| FR | 70 | 2172 | 16 | 0.74 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 3.94 |
| LT | 2 | 141 | 1 | 0.71 | 0.59 | 0.00 | 0.00 | 0.59 | 1.18 | 1.18 |
| NL | 40 | 9830 | 243 | 2.47 | 2.80 | 0.14 | 1.23 | 2.28 | 4.20 | 5.25 |
| UKEN | 89 | 11676 | 219 | 1.88 | 2.13 | 0.00 | 0.00 | 1.36 | 3.25 | 6.01 |
| UKNI | 1 | 1517 | 7 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 |
| UKSC | 1 | 649 | 11 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 |
| UKWA | 1 | 249 | 12 | 4.82 | 4.82 | 4.82 | 4.82 | 4.82 | 4.82 | 4.82 |
| Total | 262 | 29029 | 576 | 1.98 | 1.88 | 0.00 | 0.00 | 0.79 | 3.03 | 5.41 |
| Risk Index 1 | | | | | | | | | | |
| BE | 38 | 967 | 20 | 2.07 | 2.84 | 0.00 | 0.00 | 0.00 | 3.51 | 14.29 |
| ES | 13 | 707 | 27 | 3.82 | 3.74 | 0.00 | 1.06 | 2.67 | 5.26 | 9.43 |
| FI | 8 | 2435 | 116 | 4.76 | 4.19 | 0.00 | 1.38 | 3.43 | 6.84 | 10.26 |
| FR | 69 | 1114 | 20 | 1.80 | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | 7.69 |
| LT | 2 | 54 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 40 | 2997 | 140 | 4.67 | 4.82 | 0.00 | 0.00 | 3.12 | 8.58 | 12.14 |
| UKEN | 89 | 8510 | 300 | 3.53 | 3.62 | 0.00 | 0.00 | 2.70 | 5.92 | 8.33 |
| UKNI | 1 | 608 | 9 | 1.48 | 1.48 | 1.48 | 1.48 | 1.48 | 1.48 | 1.48 |
| UKSC | 1 | 602 | 16 | 2.66 | 2.66 | 2.66 | 2.66 | 2.66 | 2.66 | 2.66 |
| UKWA | 1 | 123 | 6 | 4.88 | 4.88 | 4.88 | 4.88 | 4.88 | 4.88 | 4.88 |
| Total | 262 | 18117 | 654 | 3.61 | 3.18 | 0.00 | 0.00 | 0.76 | 5.26 | 9.43 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 35 | 137 | 4 | 2.92 | 2.93 | 0.00 | 0.00 | 0.00 | 0.00 | 16.67 |
| ES | 13 | 220 | 6 | 2.73 | 4.11 | 0.00 | 0.00 | 0.00 | 2.63 | 16.67 |
| FI | 8 | 749 | 44 | 5.87 | 4.29 | 0.00 | 0.00 | 1.97 | 6.41 | 11.18 |
| FR | 38 | 96 | 2 | 2.08 | 2.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 31 | 256 | 34 | 13.28 | 11.05 | 0.00 | 0.00 | 0.00 | 14.29 | 25.00 |
| UKEN | 83 | 1006 | 53 | 5.27 | 9.08 | 0.00 | 0.00 | 0.00 | 7.69 | 20.00 |
| UKNI | 1 | 91 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKSC | 1 | 138 | 3 | 2.17 | 1.10 | 0.00 | 0.00 | 1.10 | 2.21 | 2.21 |
| UKWA | 1 | 11 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 212 | 2705 | 146 | 5.40 | 6.57 | 0.00 | 0.00 | 0.00 | 2.33 | 16.67 |
| Risk Index unknown | | | | | | | | | | |
| BE | 22 | 180 | 3 | 1.67 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FI | 8 | 791 | 11 | 1.39 | 1.74 | 0.00 | 0.00 | 1.57 | 3.22 | 4.35 |
| FR | 9 | 32 | 1 | 3.13 | 11.11 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| GR | 1 | 33 | 2 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 | 6.06 |
| LT | 2 | 6 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 19 | 513 | 12 | 2.34 | 3.38 | 0.00 | 0.00 | 0.00 | 3.70 | 14.29 |
| UKEN | 87 | 5406 | 163 | 3.02 | 2.75 | 0.00 | 0.00 | 0.00 | 3.86 | 6.72 |
| UKNI | 1 | 355 | 6 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 | 1.69 |
| UKSC | 1 | 608 | 10 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 |
| UKWA | 1 | 376 | 5 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| Total | 151 | 8300 | 213 | 2.57 | 2.94 | 0.00 | 0.00 | 0.00 | 2.81 | 5.88 |

Table 6.10. Distribution of the cumulative incidence of surgical site infection (within 30 days after operation) in laminectomy (LAM), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp operations | N of SSI | Mean | Mean of means | p10 | p25 | p50 | p75 | p90 | |
|----------------------------|-------------------|----------|------|---------------|------|------|------|------|------|------|
| All risk categories | | | | | | | | | | |
| BE | 22 | 1997 | 14 | 0.70 | 0.76 | 0.00 | 0.00 | 0.00 | 1.40 | 2.17 |
| ES | 3 | 152 | 3 | 1.97 | 1.72 | 0.00 | 0.00 | 2.53 | 2.63 | 2.63 |
| NL | 4 | 876 | 5 | 0.57 | 0.35 | 0.00 | 0.00 | 0.34 | 0.70 | 0.72 |
| Total | 29 | 3025 | 22 | 0.73 | 0.81 | 0.00 | 0.00 | 0.00 | 1.40 | 2.63 |
| Risk Index 0 | | | | | | | | | | |
| BE | 22 | 1121 | 5 | 0.45 | 0.58 | 0.00 | 0.00 | 0.00 | 0.00 | 2.56 |
| ES | 3 | 60 | 1 | 1.67 | 0.83 | 0.00 | 0.00 | 0.00 | 2.50 | 2.50 |
| NL | 4 | 845 | 4 | 0.47 | 0.30 | 0.00 | 0.00 | 0.23 | 0.60 | 0.73 |
| Total | 29 | 2026 | 10 | 0.49 | 0.57 | 0.00 | 0.00 | 0.00 | 0.00 | 2.56 |
| Risk Index 1 | | | | | | | | | | |
| BE | 22 | 664 | 7 | 1.05 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 5.26 |
| ES | 3 | 68 | 2 | 2.94 | 3.32 | 0.00 | 0.00 | 3.70 | 6.25 | 6.25 |
| NL | 4 | 30 | 1 | 3.33 | 1.92 | 0.00 | 0.00 | 0.00 | 3.85 | 7.69 |
| Total | 29 | 762 | 10 | 1.31 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 7.14 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 13 | 34 | 1 | 2.94 | 2.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 3 | 23 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 16 | 57 | 1 | 1.75 | 1.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Risk Index unknown | | | | | | | | | | |
| BE | 12 | 178 | 1 | 0.56 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 1 | 1 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 14 | 180 | 1 | 0.56 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Table 6.11. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in coronary artery bypass grafting (CABG), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|---------------------|-----------|--------------|--------------|--------------|---------------|-------------|-------------|-------------|-------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 6 | 7946 | 8 | 1,01 | 0,92 | 0,00 | 0,00 | 0,00 | 2,20 | 3,34 |
| ES | 3 | 3137 | 15 | 4,78 | 4,48 | 1,27 | 1,27 | 5,87 | 6,29 | 6,29 |
| GR | 1 | 470 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| NL | 2 | 5818 | 5 | 0,86 | 0,77 | 0,49 | 0,49 | 0,77 | 1,06 | 1,06 |
| PL | 1 | 269 | 7 | 26,02 | 26,02 | 26,02 | 26,02 | 26,02 | 26,02 | 26,02 |
| UKEN | 13 | 78976 | 233 | 2,95 | 2,64 | 1,14 | 1,84 | 2,21 | 2,97 | 4,22 |
| Total | 26 | 96616 | 268 | 2,77 | 3,11 | 0,00 | 0,80 | 2,04 | 3,34 | 5,87 |
| Risk Index 0 | | | | | | | | | | |
| BE | 5 | 1997 | 1 | 0,50 | 1,49 | 0,00 | 0,00 | 0,00 | 0,00 | 7,46 |
| ES | 2 | 249 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| UKEN | 11 | 955 | 4 | 4,19 | 4,18 | 0,00 | 0,00 | 0,00 | 2,63 | 15,15 |
| Total | 18 | 3201 | 5 | 1,56 | 2,97 | 0,00 | 0,00 | 0,00 | 0,00 | 15,15 |
| Risk Index 1 | | | | | | | | | | |
| BE | 6 | 4511 | 5 | 1,11 | 0,97 | 0,00 | 0,00 | 0,00 | 1,48 | 4,36 |
| ES | 3 | 1218 | 6 | 4,93 | 5,51 | 1,89 | 1,89 | 5,65 | 8,98 | 8,98 |
| NL | 2 | 5574 | 5 | 0,90 | 0,81 | 0,51 | 0,51 | 0,81 | 1,10 | 1,10 |
| PL | 1 | 5 | 1 | 200,00 | 200,00 | 200,00 | 200,00 | 200,00 | 200,00 | 200,00 |
| UKEN | 12 | 51429 | 123 | 2,39 | 2,01 | 0,86 | 1,11 | 1,97 | 2,91 | 3,72 |
| Total | 24 | 62737 | 140 | 2,23 | 10,34 | 0,00 | 0,69 | 1,65 | 3,32 | 5,65 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 6 | 1191 | 2 | 1,68 | 0,72 | 0,00 | 0,00 | 0,00 | 0,00 | 4,29 |
| ES | 3 | 1670 | 9 | 5,39 | 1,97 | 0,00 | 0,00 | 0,00 | 5,92 | 5,92 |
| NL | 2 | 212 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| UKEN | 12 | 6024 | 23 | 3,82 | 3,81 | 0,00 | 0,51 | 3,34 | 6,48 | 8,55 |
| Total | 23 | 9097 | 34 | 3,74 | 2,43 | 0,00 | 0,00 | 0,00 | 5,21 | 6,99 |
| Risk Index unknown | | | | | | | | | | |
| BE | 2 | 247 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| GR | 1 | 470 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| NL | 2 | 32 | 0 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| PL | 1 | 264 | 6 | 22,73 | 22,73 | 22,73 | 22,73 | 22,73 | 22,73 | 22,73 |
| UKEN | 13 | 20568 | 83 | 4,04 | 1,69 | 0,00 | 0,00 | 0,00 | 2,93 | 5,82 |
| Total | 19 | 21581 | 89 | 4,12 | 2,35 | 0,00 | 0,00 | 0,00 | 2,93 | 5,98 |

Table 6.12. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in cholecystectomy (CHOL), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|----------------------------|------------|--------------|--------------|--------------|---------------|-------------|-------------|-------------|-------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 2 | 776 | 2 | 2.58 | 4.15 | 1.59 | 1.59 | 4.15 | 6.71 | 6.71 |
| ES | 8 | 4485 | 27 | 6.02 | 5.15 | 0.00 | 0.00 | 5.33 | 9.47 | 11.59 |
| FR | 61 | 13654 | 10 | 0.73 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 2.81 |
| GR | 1 | 962 | 2 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 |
| LT | 5 | 5425 | 12 | 2.21 | 3.35 | 0.00 | 0.40 | 0.91 | 6.27 | 9.19 |
| NL | 6 | 3263 | 6 | 1.84 | 2.29 | 0.00 | 0.00 | 0.36 | 3.27 | 9.74 |
| PL | 19 | 896 | 31 | 34.60 | 71.90 | 0.00 | 9.69 | 28.40 | 102.98 | 166.67 |
| Total | 102 | 29461 | 90 | 3.05 | 10.46 | 0.00 | 0.00 | 0.00 | 3.27 | 11.90 |
| Risk Index 0 | | | | | | | | | | |
| BE | 2 | 224 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 8 | 2028 | 5 | 2.47 | 1.56 | 0.00 | 0.00 | 0.00 | 3.76 | 4.99 |
| FR | 61 | 7583 | 3 | 0.40 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 5 | 2285 | 5 | 2.19 | 2.17 | 0.00 | 0.00 | 0.00 | 2.31 | 8.55 |
| NL | 6 | 1731 | 3 | 1.73 | 1.08 | 0.00 | 0.00 | 0.00 | 1.99 | 4.50 |
| PL | 19 | 192 | 7 | 36.46 | 44.33 | 0.00 | 0.00 | 0.00 | 88.24 | 166.67 |
| Total | 101 | 14043 | 23 | 1.64 | 5.93 | 0.00 | 0.00 | 0.00 | 0.00 | 4.99 |
| Risk Index 1 | | | | | | | | | | |
| BE | 2 | 181 | 1 | 5.52 | 6.94 | 0.00 | 0.00 | 6.94 | 13.89 | 13.89 |
| ES | 8 | 1646 | 11 | 6.68 | 5.16 | 0.00 | 0.00 | 0.74 | 8.33 | 23.12 |
| FR | 60 | 4048 | 4 | 0.99 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 5 | 512 | 3 | 2.94 | 5.02 | 0.00 | 0.00 | 0.00 | 8.85 | 16.26 |
| NL | 6 | 415 | 3 | 7.23 | 7.81 | 0.00 | 0.00 | 0.00 | 0.00 | 46.88 |
| PL | 19 | 304 | 10 | 32.89 | 78.02 | 0.00 | 0.00 | 37.75 | 62.50 | 290.82 |
| Total | 100 | 7106 | 32 | 4.50 | 10.55 | 0.00 | 0.00 | 0.00 | 0.00 | 16.26 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 1 | 51 | 1 | 19.61 | 19.61 | 19.61 | 19.61 | 19.61 | 19.61 | 19.61 |
| ES | 7 | 811 | 11 | 13.56 | 30.94 | 0.00 | 0.00 | 8.13 | 33.33 | 51.72 |
| FR | 45 | 1991 | 3 | 1.51 | 1.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 3 | 167 | 2 | 11.98 | 7.25 | 0.00 | 0.00 | 7.04 | 14.50 | 14.93 |
| NL | 4 | 218 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 18 | 219 | 11 | 50.23 | 187.44 | 0.00 | 0.00 | 55.63 | 250.00 | 625.00 |
| Total | 78 | 3457 | 28 | 8.10 | 26.60 | 0.00 | 0.00 | 0.00 | 0.00 | 33.33 |
| Risk Index unknown | | | | | | | | | | |
| BE | 2 | 320 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 1 | 32 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 962 | 2 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 | 2.08 |
| LT | 4 | 2461 | 2 | 0.81 | 4.27 | 0.00 | 0.00 | 0.21 | 8.54 | 16.67 |
| NL | 3 | 899 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 10 | 181 | 3 | 16.57 | 56.25 | 0.00 | 0.00 | 31.25 | 50.00 | 200.00 |
| Total | 21 | 4855 | 7 | 1.44 | 18.78 | 0.00 | 0.00 | 0.00 | 9.37 | 50.00 |

Table 6.13. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in colon surgery (COLO), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|----------------------------|------------|---------------|--------------|--------------|---------------|-------------|-------------|-------------|--------------|--------------|
| All risk categories | | | | | | | | | | |
| BE | 30 | 20196 | 69 | 3.42 | 3.86 | 0.00 | 0.00 | 2.38 | 5.36 | 9.45 |
| ES | 12 | 14451 | 255 | 17.65 | 15.85 | 8.42 | 12.22 | 16.00 | 19.27 | 21.52 |
| FR | 27 | 16068 | 50 | 3.11 | 3.41 | 0.00 | 0.00 | 1.27 | 3.89 | 11.82 |
| GR | 1 | 1273 | 10 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 |
| LT | 3 | 2831 | 48 | 16.96 | 15.24 | 5.06 | 5.06 | 18.52 | 22.14 | 22.14 |
| NL | 15 | 15182 | 87 | 5.73 | 4.98 | 1.88 | 2.43 | 5.20 | 6.81 | 8.37 |
| PL | 12 | 602 | 30 | 49.83 | 106.12 | 0.00 | 48.98 | 75.50 | 150.00 | 300.00 |
| UKEN | 28 | 45519 | 318 | 6.99 | 6.66 | 0.38 | 4.43 | 6.77 | 8.31 | 11.51 |
| Total | 128 | 116122 | 867 | 7.47 | 12.66 | 0.00 | 1.24 | 5.32 | 10.87 | 19.09 |
| Risk Index 0 | | | | | | | | | | |
| BE | 28 | 5291 | 22 | 4.16 | 5.96 | 0.00 | 0.00 | 0.00 | 6.40 | 23.26 |
| ES | 8 | 2383 | 40 | 16.79 | 15.97 | 0.00 | 11.10 | 17.31 | 22.69 | 25.58 |
| FR | 27 | 5099 | 6 | 1.18 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 | 4.37 |
| LT | 3 | 474 | 12 | 25.32 | 15.07 | 0.00 | 0.00 | 15.27 | 29.94 | 29.94 |
| NL | 15 | 5779 | 26 | 4.50 | 3.92 | 0.00 | 0.00 | 3.52 | 6.29 | 10.24 |
| PL | 10 | 60 | 4 | 66.67 | 68.57 | 57.14 | 57.14 | 68.57 | 80.00 | 80.00 |
| UKEN | 27 | 14442 | 73 | 5.05 | 4.85 | 0.00 | 2.15 | 3.57 | 7.43 | 11.17 |
| Total | 118 | 33528 | 183 | 5.46 | 6.34 | 0.00 | 0.00 | 2.31 | 7.48 | 16.53 |
| Risk Index 1 | | | | | | | | | | |
| BE | 30 | 8160 | 21 | 2.57 | 3.90 | 0.00 | 0.00 | 0.00 | 5.08 | 8.39 |
| ES | 12 | 4962 | 88 | 17.73 | 17.47 | 9.97 | 10.73 | 17.57 | 21.55 | 23.74 |
| FR | 27 | 7017 | 18 | 2.57 | 2.86 | 0.00 | 0.00 | 1.06 | 5.46 | 7.69 |
| LT | 3 | 861 | 17 | 19.74 | 13.18 | 0.00 | 0.00 | 19.74 | 19.80 | 19.80 |
| NL | 15 | 5373 | 30 | 5.58 | 4.31 | 0.00 | 0.00 | 3.65 | 7.07 | 7.79 |
| PL | 11 | 189 | 11 | 58.20 | 124.00 | 0.00 | 43.48 | 72.47 | 222.22 | 333.33 |
| UKEN | 28 | 17952 | 121 | 6.74 | 6.78 | 0.00 | 3.60 | 6.67 | 10.21 | 14.08 |
| Total | 126 | 44514 | 306 | 6.87 | 11.98 | 0.00 | 0.00 | 4.06 | 10.09 | 19.77 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 28 | 5028 | 20 | 3.98 | 7.12 | 0.00 | 0.00 | 0.00 | 8.00 | 20.41 |
| ES | 12 | 7088 | 127 | 17.92 | 19.04 | 0.00 | 9.48 | 19.29 | 25.64 | 37.04 |
| FR | 24 | 3843 | 26 | 6.77 | 9.46 | 0.00 | 0.00 | 0.00 | 7.40 | 30.30 |
| LT | 3 | 686 | 13 | 18.95 | 17.24 | 0.00 | 9.24 | 18.86 | 25.24 | 31.25 |
| NL | 12 | 2338 | 21 | 8.98 | 5.76 | 0.00 | 0.00 | 0.00 | 12.99 | 14.53 |
| PL | 12 | 160 | 11 | 68.75 | 226.22 | 19.61 | 45.45 | 76.92 | 250.00 | 1000.00 |
| UKEN | 27 | 7787 | 90 | 11.56 | 11.76 | 0.00 | 0.00 | 6.58 | 16.39 | 32.26 |
| Total | 118 | 26930 | 308 | 11.44 | 19.90 | 0.00 | 0.00 | 3.87 | 19.05 | 37.04 |
| Risk Index unknown | | | | | | | | | | |
| BE | 13 | 1717 | 6 | 3.49 | 12.17 | 0.00 | 0.00 | 0.00 | 2.93 | 23.81 |
| ES | 1 | 18 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 3 | 109 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 1273 | 10 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 | 7.86 |
| LT | 3 | 810 | 6 | 7.41 | 25.53 | 0.00 | 0.00 | 5.17 | 71.43 | 71.43 |
| NL | 7 | 1692 | 10 | 5.91 | 2.68 | 0.00 | 0.00 | 0.00 | 5.99 | 7.25 |
| PL | 4 | 193 | 4 | 20.73 | 92.26 | 0.00 | 41.67 | 113.10 | 142.86 | 142.86 |
| UKEN | 25 | 5338 | 34 | 6.37 | 5.14 | 0.00 | 0.00 | 3.33 | 7.04 | 14.45 |
| Total | 57 | 11150 | 70 | 6.28 | 13.32 | 0.00 | 0.00 | 2.59 | 7.04 | 23.81 |

Table 6.14. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in caesarean section (CSEC), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|---------------------|--------|--------------|--------------|--------------|---------------|-------|-------|--------|--------|--------|
| All risk categories | | | | | | | | | | |
| BE | 1 | 683 | 6 | 8.78 | 8.78 | 8.78 | 8.78 | 8.78 | 8.78 | 8.78 |
| ES | 4 | 3011 | 21 | 6.97 | 4.47 | 0.00 | 1.85 | 4.75 | 7.08 | 8.37 |
| FR | 29 | 11246 | 23 | 2.05 | 2.39 | 0.00 | 0.00 | 0.00 | 3.22 | 8.57 |
| GR | 1 | 216 | 1 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 |
| LT | 4 | 3168 | 17 | 5.37 | 4.79 | 0.00 | 2.31 | 5.63 | 7.26 | 7.89 |
| NL | 5 | 5840 | 4 | 0.68 | 0.57 | 0.00 | 0.00 | 0.61 | 0.96 | 1.29 |
| PL | 15 | 359 | 22 | 61.28 | 90.86 | 0.00 | 24.39 | 52.63 | 166.67 | 250.00 |
| UKSC | 5 | 6392 | 28 | 4.38 | 3.26 | 0.00 | 2.43 | 3.98 | 4.34 | 5.56 |
| Total | 64 | 30915 | 122 | 3.95 | 16.50 | 0.00 | 0.00 | 2.29 | 5.79 | 31.58 |
| Risk Index 0 | | | | | | | | | | |
| BE | 1 | 432 | 5 | 11.57 | 11.57 | 11.57 | 11.57 | 11.57 | 11.57 | 11.57 |
| ES | 4 | 2041 | 16 | 7.84 | 4.87 | 0.00 | 1.86 | 4.07 | 7.89 | 11.35 |
| FR | 29 | 9632 | 17 | 1.76 | 2.04 | 0.00 | 0.00 | 0.00 | 2.48 | 9.01 |
| LT | 4 | 2604 | 15 | 5.76 | 5.06 | 0.00 | 2.52 | 5.92 | 7.60 | 8.40 |
| NL | 5 | 5148 | 3 | 0.58 | 0.36 | 0.00 | 0.00 | 0.00 | 0.81 | 0.97 |
| PL | 13 | 114 | 10 | 87.72 | 86.30 | 0.00 | 0.00 | 18.18 | 133.33 | 280.00 |
| UKSC | 5 | 2596 | 8 | 3.08 | 2.55 | 0.00 | 2.65 | 2.88 | 3.37 | 3.85 |
| Total | 61 | 22567 | 74 | 3.28 | 10.50 | 0.00 | 0.00 | 0.97 | 3.85 | 11.35 |
| Risk Index 1 | | | | | | | | | | |
| BE | 1 | 108 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 4 | 911 | 5 | 5.49 | 4.35 | 0.00 | 0.00 | 2.12 | 8.70 | 13.16 |
| FR | 28 | 1515 | 5 | 3.30 | 2.52 | 0.00 | 0.00 | 0.00 | 0.00 | 21.28 |
| LT | 4 | 421 | 1 | 2.38 | 0.77 | 0.00 | 0.00 | 0.00 | 1.54 | 3.09 |
| NL | 5 | 491 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PL | 11 | 10 | 1 | 100.00 | 125.00 | 0.00 | 0.00 | 125.00 | 250.00 | 250.00 |
| UKSC | 4 | 217 | 3 | 13.82 | 9.39 | 0.00 | 0.00 | 7.14 | 18.77 | 23.26 |
| Total | 57 | 3673 | 15 | 4.08 | 7.88 | 0.00 | 0.00 | 0.00 | 0.00 | 21.28 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 1 | 10 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 1 | 59 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FR | 6 | 71 | 1 | 14.08 | 16.67 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| LT | 1 | 18 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 1 | 14 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKSC | 1 | 6 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 11 | 178 | 1 | 5.62 | 9.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Risk Index unknown | | | | | | | | | | |
| BE | 1 | 133 | 1 | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 | 7.52 |
| FR | 2 | 28 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GR | 1 | 216 | 1 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 | 4.63 |
| LT | 2 | 125 | 1 | 8.00 | 4.24 | 0.00 | 0.00 | 4.24 | 8.47 | 8.47 |
| NL | 3 | 187 | 1 | 5.35 | 10.42 | 0.00 | 0.00 | 0.00 | 31.25 | 31.25 |
| PL | 7 | 235 | 11 | 46.81 | 111.19 | 24.39 | 31.58 | 66.67 | 100.00 | 333.33 |
| UKSC | 5 | 3573 | 17 | 4.76 | 2.61 | 0.00 | 0.00 | 0.00 | 4.58 | 8.49 |
| Total | 21 | 4497 | 32 | 7.12 | 32.68 | 0.00 | 0.00 | 4.63 | 31.25 | 100.00 |

Table 6.15. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in hip arthroplasty (HPRO), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|---------------------|------------|---------------|--------------|--------------|---------------|-------------|-------------|-------------|-------------|-------------|
| All risk categories | | | | | | | | | | |
| BE | 38 | 37054 | 28 | 0.76 | 1.07 | 0.00 | 0.00 | 0.00 | 2.00 | 3.52 |
| ES | 13 | 16016 | 38 | 2.37 | 2.14 | 0.00 | 0.00 | 1.04 | 2.58 | 5.58 |
| FI | 8 | 40068 | 101 | 2.52 | 2.20 | 0.00 | 0.62 | 0.65 | 4.80 | 6.49 |
| FR | 70 | 44974 | 22 | 0.49 | 0.54 | 0.00 | 0.00 | 0.00 | 0.65 | 2.18 |
| GR | 1 | 310 | 1 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 |
| LT | 2 | 2463 | 1 | 0.41 | 0.37 | 0.00 | 0.00 | 0.37 | 0.73 | 0.73 |
| NL | 40 | 160884 | 300 | 1.86 | 1.84 | 0.00 | 0.49 | 1.12 | 2.53 | 5.96 |
| UKEN | 90 | 369431 | 734 | 1.99 | 2.13 | 0.10 | 1.04 | 1.83 | 3.09 | 4.12 |
| UKNI | 1 | 19637 | 10 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 |
| UKSC | 1 | 19790 | 37 | 1.87 | 1.87 | 1.87 | 1.87 | 1.87 | 1.87 | 1.87 |
| UKWA | 1 | 9665 | 17 | 1.76 | 1.76 | 1.76 | 1.76 | 1.76 | 1.76 | 1.76 |
| Total | 265 | 720292 | 1289 | 1.79 | 1.49 | 0.00 | 0.00 | 1.01 | 2.31 | 3.82 |
| Risk Index 0 | | | | | | | | | | |
| BE | 37 | 14456 | 10 | 0.69 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 | 3.91 |
| ES | 13 | 4951 | 8 | 1.62 | 1.35 | 0.00 | 0.00 | 0.00 | 0.00 | 7.66 |
| FI | 8 | 10177 | 20 | 1.97 | 2.20 | 0.00 | 0.77 | 1.28 | 4.68 | 5.18 |
| FR | 70 | 27479 | 9 | 0.33 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 1.73 |
| LT | 2 | 1698 | 1 | 0.59 | 0.50 | 0.00 | 0.00 | 0.50 | 0.99 | 0.99 |
| NL | 40 | 105521 | 155 | 1.47 | 1.48 | 0.00 | 0.41 | 0.79 | 2.41 | 3.95 |
| UKEN | 89 | 142092 | 218 | 1.53 | 1.73 | 0.00 | 0.00 | 1.23 | 2.85 | 4.67 |
| UKNI | 1 | 9786 | 1 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| UKSC | 1 | 5810 | 11 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 |
| UKWA | 1 | 2651 | 9 | 3.39 | 3.39 | 3.39 | 3.39 | 3.39 | 3.39 | 3.39 |
| Total | 262 | 324621 | 442 | 1.36 | 1.20 | 0.00 | 0.00 | 0.00 | 1.85 | 3.84 |
| Risk Index 1 | | | | | | | | | | |
| BE | 38 | 16356 | 16 | 0.98 | 1.50 | 0.00 | 0.00 | 0.00 | 1.70 | 6.13 |
| ES | 13 | 8246 | 24 | 2.91 | 2.43 | 0.00 | 0.00 | 1.79 | 2.64 | 6.49 |
| FI | 8 | 17124 | 49 | 2.86 | 2.62 | 0.00 | 0.00 | 0.31 | 6.42 | 8.66 |
| FR | 69 | 15461 | 10 | 0.65 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 1.74 |
| LT | 2 | 684 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 40 | 44598 | 109 | 2.44 | 2.40 | 0.00 | 0.00 | 1.25 | 3.65 | 7.58 |
| UKEN | 89 | 135761 | 300 | 2.21 | 2.35 | 0.00 | 0.00 | 1.82 | 3.80 | 5.22 |
| UKNI | 1 | 5145 | 4 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| UKSC | 1 | 6408 | 16 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| UKWA | 1 | 1387 | 3 | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 | 2.16 |
| Total | 262 | 251170 | 531 | 2.11 | 1.75 | 0.00 | 0.00 | 0.00 | 2.61 | 5.99 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 35 | 3028 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 13 | 2819 | 6 | 2.13 | 2.31 | 0.00 | 0.00 | 0.00 | 2.13 | 12.50 |
| FI | 8 | 5934 | 27 | 4.55 | 3.17 | 0.00 | 0.00 | 0.27 | 2.26 | 13.48 |
| FR | 38 | 1545 | 2 | 1.29 | 2.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LT | 1 | 13 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 31 | 4738 | 27 | 5.70 | 6.54 | 0.00 | 0.00 | 0.00 | 5.41 | 14.93 |
| UKEN | 83 | 16303 | 53 | 3.25 | 7.35 | 0.00 | 0.00 | 0.00 | 3.62 | 16.95 |
| UKNI | 1 | 1853 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| UKSC | 1 | 1885 | 3 | 1.59 | 0.80 | 0.00 | 0.00 | 0.80 | 1.61 | 1.61 |
| UKWA | 1 | 159 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 212 | 38277 | 118 | 3.08 | 4.55 | 0.00 | 0.00 | 0.00 | 0.00 | 8.35 |
| Risk Index unknown | | | | | | | | | | |
| BE | 22 | 3214 | 2 | 0.62 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| FI | 8 | 6833 | 5 | 0.73 | 1.09 | 0.00 | 0.00 | 0.00 | 0.77 | 5.78 |
| FR | 9 | 489 | 1 | 2.04 | 12.35 | 0.00 | 0.00 | 0.00 | 0.00 | 111.11 |
| GR | 1 | 310 | 1 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 | 3.23 |
| LT | 2 | 68 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 19 | 6027 | 9 | 1.49 | 3.00 | 0.00 | 0.00 | 0.00 | 2.62 | 13.70 |
| UKEN | 87 | 75275 | 163 | 2.17 | 2.19 | 0.00 | 0.00 | 0.00 | 2.83 | 5.39 |
| UKNI | 1 | 2853 | 5 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |
| UKSC | 1 | 5687 | 7 | 1.23 | 1.23 | 1.23 | 1.23 | 1.23 | 1.23 | 1.23 |
| UKWA | 1 | 5468 | 5 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Total | 151 | 106224 | 198 | 1.86 | 2.52 | 0.00 | 0.00 | 0.00 | 1.75 | 4.78 |

Table 6.16. Distribution of the incidence density of surgical site infection (n of in-hospital SSI/1000 patient-days in hospital) in laminectomy (LAM), by NNIS risk index and country, hospitals including at least 20 operations, 2000-2003

| | N Hosp | Patient days | In-hosp. SSI | Overall Rate | Mean of rates | p10 | p25 | p50 | p75 | p90 |
|---------------------|--------|--------------|--------------|--------------|---------------|------|------|------|------|------|
| All risk categories | | | | | | | | | | |
| BE | 22 | 14332 | 9 | 0.63 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 2.07 |
| ES | 3 | 1215 | 3 | 2.47 | 1.93 | 0.00 | 0.00 | 2.78 | 3.01 | 3.01 |
| NL | 4 | 5852 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 29 | 21399 | 12 | 0.56 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 2.31 |
| Risk Index 0 | | | | | | | | | | |
| BE | 22 | 7165 | 2 | 0.28 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 3 | 364 | 1 | 2.75 | 1.41 | 0.00 | 0.00 | 0.00 | 4.22 | 4.22 |
| NL | 4 | 5589 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 29 | 13118 | 3 | 0.23 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 2.24 |
| Risk Index 1 | | | | | | | | | | |
| BE | 22 | 5066 | 5 | 0.99 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 3 | 609 | 2 | 3.28 | 2.99 | 0.00 | 0.00 | 3.57 | 5.41 | 5.41 |
| NL | 4 | 257 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 29 | 5932 | 7 | 1.18 | 0.76 | 0.00 | 0.00 | 0.00 | 0.00 | 5.41 |
| Risk Index 2,3 | | | | | | | | | | |
| BE | 13 | 564 | 1 | 1.77 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 3 | 230 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 16 | 794 | 1 | 1.26 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Risk Index unknown | | | | | | | | | | |
| BE | 12 | 1537 | 1 | 0.65 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ES | 1 | 12 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NL | 1 | 6 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 14 | 1555 | 1 | 0.64 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |