**Appendix 2. Background information of the surveillance algorithms**

**Table S1. Minimum required dataset to apply classification model and/or regression model**

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| **Theme** | **Variable1** | **Format** |
| Identifier | Identification number | numeric/text |
| Demographics | Age | numeric/text |
|  | Sex | numeric/text |
| Index surgery (Colorectal surgery) | Date of surgery | date |
|  | Description surgery (e.g. ICD-9/10 /CTG) | text |
|  | Treating specialty | text |
|  | Surgical technique | text |
|  | Date of admission | date |
|  | Date of discharge | date |
|  | Treating specialty | text |
|  | Wound class# | numeric/text |
| Readmission(s)\* | Date of admission | date |
|  | Date of discharge | date |
|  | Treating specialty | text |
| Re-surgery\* | Date of reoperation | date |
|  | Procedure code (e.g. ICD-9/10/CTG) | text |
|  | Description surgery | text |
|  | Treating specialty | text |
| Microbiology\*§ | Date of culture taken | date |
|  | Sample number | numeric/text |
|  | Sample material (e.g. blood, tissue) | text |
|  | Sample material additional text | text |
|  | Result | text |
|  | Conclusion/quantity | text |
| Antibiotics\* | Code (ATC in categories J01)/description | text |
|  | Start date | date |
|  | Stop date | date |
| Radiology\*§ | Date of radiology order | date |
|  | Procedure | numeric/text |
|  | Description | text |
|  | Treating Specialty | text |
| Mortality | 30-day mortality | date |

1 all data until 45 days post-surgery for the classification model, 30 days post-surgery for the regression model

\*Data may contain more than 1 record per patient

# Only required for the regression model

§ Only required for the classification model

|  |  |  |
| --- | --- | --- |
| **Elements algorithm** | **Criteriaa** | **Specification** |
| **(Re)Admissions** | Length of stay of index admission ≥ 14 days  OR  ≥ 1 re-admission OR Death | Length of hospital stay of the index admission (i.e., admission during which the colorectal surgery took place) of ≥ 14 days ((discharge date – date of index surgery) +1)  OR  ≥ 1 readmission(s) for the relevant specialty (i.e. specialty surgery or gastrointestinal oncology surgery), after the index surgery but within FU time  OR  Mortality within FU time |
| **Re-surgery** | ≥1 reoperation by original surgery specialty | Surgeries performed by the department of surgery or gastrointestinal oncology surgery, after the index surgery and within FU time. No further restrictions. |
| **Antibiotics** | ≥3 consecutive days of antibiotics (ATC J01) post-operative, starting from day 2 | All antibiotic orders (ATC J01) prescribed from day 2\* until end of FU, including outpatient prescriptions but excluding ICU prescriptions. Overlapping episodes count as 1 day (e.g. two antibiotic prescriptions, one for 4 days and one for 2 days of which 1 days overlap result in a total of 5 consecutive days of antibiotic exposure). |
| **Radiology** | Ordering CT scan | CT scan order within FU time |
| **Microbiology**$ | ≥1 culture taken from relevant body sites | ≥ 1 culture obtained from potentially relevant body site(s), such as wound cultures, purulent, fluid, drain, tissue, unspecified material. All cultures are taken into account from day 1\* until end FU. |
| \*Date of initial, index surgery = day 0 a All criteria should be fulfilled within 45 days after the index surgery (follow up (FU) time=45 days) $ Microbiology element only applied if 2 or 3 criteria from above are met | | |

**Table S2: Algorithm specifications classification model**

**General rules for applying the classification model (data cleaning)**

* A patient can only be included in the surveillance once, as only primary resections are included in the surveillance. Secondary colorectal resections are excluded from the surveillance population.
* If a patient has more index colorectal resection procedures during the same surgery, the resection with the highest risk is included in the surveillance. The highest risk is defined as the procedure in which the lowest part of the colon is removed.
* Patients can be included several times in the admission, antibiotic or microbiology data as they can have can have multiple readmissions, antibiotics or microbiology results.
* If start- and stop date of antibiotic prescriptions or admission/discharge dates are swapped: the number of days is converted from minus to plus.
* Microbiology results obtained from 1 culture count as 1 result.
* If an algorithm element cannot be computed due to incomplete data, the index surgery is flagged positive on that algorithm element.

**Table S3: Algorithm specifications prediction model**

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| --- | --- | --- |
| **Elements algorithm** | **Criteriaa** | **Coefficient** |
| **Post-operative length of stay** | Length of stay of initial surgery in days | 0.085 |
| **Re-surgery** | ≥1 reoperation by original surgery specialty | 3.037 |
| **Readmission** | ≥ 1 readmission(s) for the relevant specialty (i.e. specialty surgery or gastrointestinal oncology surgery), after the index surgery but within FU time | 1.489 |
| **Wound class** | Wound class 2 or wound class 3 | 0.890 |
| **Death** | Mortality within FU time | 1.127 |
| a All criteria should be fulfilled within 30 days after the index surgery (FU time=30 days). Date of initial, index surgery = day 0. Intercept=-5.234 | |  |