Cost-effectiveness of selective decontamination of the digestive tract to decrease infectious complications in colorectal cancer surgery
the SELECT-trial group

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Cost-effectiveness of selective decontamination of the digestive tract to decrease infectious complications in colorectal cancer surgery: An analysis of the SELECT trial

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\textbf{ABSTRACT}

\textbf{Introduction:} Selective decontamination of the digestive tract (SDD) is effective in reducing infectious complications in elective colorectal cancer (CRC) surgery. However, it is unclear whether SDD is cost-effective compared to standard antibiotic prophylaxis.

\textbf{Material & methods:} Economic evaluation alongside multicenter randomized controlled trial, the SELECT-trial, from a healthcare perspective. Patients included underwent elective surgery for non-metastatic CRC. The intervention group received oral non-absorbable colistin, tobramycin and amphotericin B (SDD) next to standard antibiotic prophylaxis. Both groups received a single shot intravenous cefazolin and metronidazole preoperatively as standard prophylaxis. Occurrence of postoperative infectious complication in the first 30 postoperative days was extracted from medical records, Quality-Adjusted Life-Years (QALYs) based on the ED-5D-3L, and healthcare costs collected from the hospital’s financial administration.

\textbf{Results:} Of the 455 patients, 228 were randomly assigned to intervention group and 227 patients to the control group. SDD significantly reduced the number of infectious complications compared to control (difference = 0.13, 95 % CI -0.05 to 0.20). No difference was found for QALYs (difference = 0.002, 95 % CI -0.002 to 0.005). Healthcare costs were statistically significantly lower in the intervention group (difference = €1258, 95 % CI -2751 to 166). The ICER was –9872 / infectious complication prevented and –$20,380 / QALY gained. For all willingness-to-pay thresholds, the probability that prophylactic SDD was cost-effective compared to standard prophylactic practice alone was 1.0.

\textbf{Conclusion:} The addition of SDD to the standard preoperative intravenous antibiotic prophylaxis is cost-effective compared to standard prophylactic practice from a healthcare perspective and should be considered as the standard of care.

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1. Introduction

Surgical resection remains the cornerstone of curative treatment of colorectal cancer (CRC) [1]. Despite advances in techniques and perioperative care, 15–30% of patients undergoing CRC surgery develop infectious complications, that includes surgical site infections and anastomotic leakage [2–4]. Infectious complications are the main driver of healthcare costs after CRC surgery, and their management can lead to a 40% increase in costs compared to patients not suffering from postoperative infections [5,6].

Current standard of care to reduce infections after CRC surgery consists of preoperative prophylactic administration of intravenous antibiotics [7]. Additional interventions such as oral antibiotics prophylaxis, with or without mechanical bowel preparation, have been shown to be effective in reducing overall infectious complications [2,3,8]. Despite this evidence, oral antibiotic administration before surgery varies globally from around 30% in Europe to 95% in the U.S.A [9]. The Dutch randomized multicenter SELECT trial recently showed that the use of a specific regime of oral antibiotics prophylaxis, known as selective decontamination of the digestive tract (SDD), is effective in reducing infectious complications [2].

To maximize efficiency and prioritize limited resources in healthcare systems, policy makers use economic evaluations in the form of cost-effectiveness analyses [10,11]. Although cost-effectiveness of SDD in gastrointestinal surgery has been reported, there have been no previous studies that investigated the cost-effectiveness of SDD prophylaxis in the context of elective CRC surgery [12,13]. Therefore, the aim of this study was to evaluate the cost-effectiveness of the addition of SDD to the standard preoperative intravenous antibiotic prophylaxis in elective CRC surgery compared to the standard preoperative intravenous antibiotic prophylaxis alone from a healthcare perspective.

2. Methods

This is an economic evaluation alongside the SELECT trial, which was superiority, open-label, multicenter, randomized controlled trial (RCT) conducted in six Dutch hospitals. The aim of this RCT was to investigate the effect of adding an oral antibiotic prophylaxis to the standard preoperative intravenous antibiotic prophylaxis on infectious complications compared to the standard preoperative intravenous antibiotic prophylaxis. We further refer to this oral antibiotic as selective decontamination of the digestive tract (SDD). The trial was registered under ClinicalTrials.gov number NCT01740947 [14]. This study is reported according to the Consolidated Health Economic Evaluation Reporting Standards 2022 Statement [15].

2.1. Study population

The study population included patients who underwent elective surgery with a primary bowel anastomosis for non-metastatic CRC. Exclusion criteria included other malignancy, inflammatory bowel disease, previous surgery for diverticular disease, ASA grade IV, polyposis/familial cancer syndromes, or inability to give informed consent. After the informed consent, participants were randomly assigned to SDD or standard preoperative intravenous antibiotic prophylaxis (control) in a 1:1 ratio. Patients who underwent left-sided, sigmoid or rectal resections received preoperative mechanical bowel preparation. Randomization was stratified by hospital, tumor localization, and type of resection (2). Further details on the study population are described in the original SELECT publication [2].

2.2. Setting and location

The SELECT trial was conducted at one university medical center and five teaching hospitals in the Netherlands. In all hospitals, the standard practice is to use intravenous antibiotic prophylaxis prior to CRC surgery to reduce the risk of surgical site infections according to national Dutch guidelines on CRC care [16]. All patients were operated on by specialized colorectal surgeons, or under direct supervision in the case surgery was performed by a resident.

2.3. Perspective and time horizon

For this economic evaluation, the healthcare perspective was adopted as only healthcare costs were assessed. The results describe the patients’ health in the first three months after surgery, therefore discounting was not necessary [10].

2.4. Comparators

The control group received the standard intravenous antibiotics prophylaxis 30 min prior to the CRC surgery, which consisted of 2000 mg cefazoline and 500 mg metronidazole. The intervention group received the same standard intravenous regime plus additional oral antibiotics prophylaxis consisting of 100 mg colistin sulphate, 80 mg tobramycin and 500 mg amphotericin B. SDD administration started 3 days prior to surgery and was continued until normal bowel motion was observed. Follow-up was performed according to national Dutch guidelines on CRC care [16].

2.5. Effect outcomes

Two effect outcomes were used in this economic evaluation. For the cost-effectiveness analysis, the occurrence of infectious complications was used as the effect outcome. Infectious complications were defined as surgical site infections, intra-abdominal infection and/or anastomotic leakage or other infections such as pneumonia within 90 days after the index operation. For definitions we refer to the original publication [2]. Data on infectious complications were prospectively collected from medical records by data collectors who were not masked, since the study was designed as open label trial. For the cost-utility analysis, Quality-Adjusted Life-Years (QALYs) were used. QALYs were calculated based on health-related quality of life data collected using the EQ-5D-3L at baseline and 3 months after the index operation. The EQ-5D-3L includes five dimensions of quality of life (i.e., mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and 3 response levels (i.e., no problems, some problems, and severe problems). The participants’ health states obtained from the EQ-5D-3L responses were converted in utility values using the Dutch tariff [17]. The utility values were used to calculate QALYs by means of the area under the curve method (i.e., the mean utility value between baseline and 3-month follow-up multiplied by 0.25 years, i.e., 3 months) [10].

2.6. Cost outcomes

Data on utilization of healthcare resources used during the 3-month follow-up were collected from the SELECT study database which contains all information from the patients’ case report form (CRF). Resource use related to the SDD medication, the number of hospital admission days (i.e., surgical ward and intensive care unit [ICU]) and reinterventions (i.e., reoperation, transanal abscess drainage and radiological drainage) were collected. Unit costs of SDD medications and reinterventions were collected from the hospital’s financial administration. Unit costs of hospital admission days were based on the Dutch standard costs [18]. Given that costs related to the CRC surgery and to the standard intravenous antibiotic prophylaxis were the same for all patients in both groups, they were not included in the analyses. Thus, intervention costs in the control group were zero, while in the intervention group, intervention costs consisted of the costs of the additional oral antibiotic prophylaxis. All costs were collected in 2019 and indexed to 2021 using the Consumer Price Index [19] (Supplementary Table A1).
separately, and estimates were pooled using Rubin %, resulting in 10 imputed datasets [22]. The 10 datasets were analyzed the skewed distribution of the costs [21]. The number of imputations (CE-planes) [25]. Cost-effectiveness acceptability curves (CEACs) were
strapped cost-effect pairs were plotted on cost-effectiveness planes
generated bootstrapping with 5000 replications was used to estimate the
to the outcome in the univariate analyses. For QALYs, baseline utility
two-level structure was used where hospital and participants repre
ested to show the probability of SDD being cost-effective compared
to control for a range of willingness-to-pay (WTP) thresholds (i.e., the
maximum amount of money the healthcare system is willing to pay for a
unit of effect gained) [26]. For the outcome occurrence of infectious complications, we used a maximum WTP of €2098 which is equivalent
to the costs of one admission day on the ICU [18]. For QALYs, we used a
WTP threshold of €200,000/QALY gained as recommended by the Dutch
Health Care Institute [27].

2.8. Sensitivity analyses

Two sensitivity analyses (SA) were performed to assess the robustness
of the results. SA1 was performed using seemingly unrelated regression (SUR) [28]. Differently than the multilevel model used in the
main analysis, the SUR model accounts for the inherent correlation
between costs and effects, e.g., in situations where patients with poor
health require more intensive treatment and, thus, have higher costs
[28]. However, the SUR model does not account for the multilevel
structure of the data. SA2 was a complete case analysis, meaning that
only cases with complete data were included in the analysis.

3. Results

3.1. Study population

A total of 455 colorectal cancer patients were included in the SELECT
trial, of whom 227 (49.9 %) were allocated to the control group and 228
(50.1 %) to the intervention group (see Table 1). Complete data was
available on the effect outcome occurrence of infectious complications.
Baseline EQ-5D-3L was completed by 77 % of the participants in the
control (n = 174) and the intervention (n = 175) group. After three
months, the EQ-5D-3L was completed by 69 % of the participants in the
control trial, of whom 227 (49.9 %) were allocated to the control group and 228
(50.1 %) to the intervention group (see Table 1). Complete data was
available on the effect outcome occurrence of infectious complications.

### Table 1

Baseline characteristics.

<table>
<thead>
<tr>
<th></th>
<th>SDD (n = 228)</th>
<th>Control (n = 227)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>67.5 (8.4)</td>
<td>68.1 (9.0)</td>
</tr>
<tr>
<td>Sex ratio (M:F)</td>
<td>131 (57): 97 (43)</td>
<td>134 (59):93 (41)</td>
</tr>
<tr>
<td>ASA fitness grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (healthy)</td>
<td>60 (26.3)</td>
<td>64 (28.2)</td>
</tr>
<tr>
<td>II (mild systemic disease)</td>
<td>137 (60.1)</td>
<td>129 (58.6)</td>
</tr>
<tr>
<td>III (severe systemic disease)</td>
<td>31 (13.6)</td>
<td>33 (14.5)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>1 (0.4)</td>
</tr>
<tr>
<td>BMI (kg/m²)*</td>
<td>26.7 (4.3)</td>
<td>25.9 (4.3)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>36 (15.9)</td>
<td>24 (10.7)</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (0.4)</td>
<td>2 (0.9)</td>
</tr>
<tr>
<td>Preoperative hemoglobin level (mmol/l)*</td>
<td>8.2 (1.2)</td>
<td>8.2 (1.2)</td>
</tr>
<tr>
<td>Active smoker</td>
<td>29 (14.1)</td>
<td>32 (15.4)</td>
</tr>
<tr>
<td>Missing</td>
<td>23 (10.1)</td>
<td>19 (8.4)</td>
</tr>
<tr>
<td>Neoadjuvant therapy</td>
<td>6 (2.6)</td>
<td>13 (5.7)</td>
</tr>
<tr>
<td>Surgical intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right hemicolectomy</td>
<td>84 (36.8)</td>
<td>78 (34.4)</td>
</tr>
<tr>
<td>Transverse colectomy</td>
<td>11 (4.8)</td>
<td>6 (2.6)</td>
</tr>
<tr>
<td>Left hemicolectomy (extended)</td>
<td>21 (9.2)</td>
<td>20 (8.8)</td>
</tr>
<tr>
<td>Sigmoid resection</td>
<td>60 (26.3)</td>
<td>64 (28.2)</td>
</tr>
<tr>
<td>Low anterior resection</td>
<td>47 (20.6)</td>
<td>56 (24.7)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (2.2)</td>
<td>3 (1.3)</td>
</tr>
<tr>
<td>Type of surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>224 (98.2)</td>
<td>223 (98.2)</td>
</tr>
<tr>
<td>Open</td>
<td>4 (1.8)</td>
<td>4 (1.8)</td>
</tr>
<tr>
<td>Bowel preparation</td>
<td>155 (68.0)</td>
<td>161 (70.9)</td>
</tr>
<tr>
<td>Diverting ileostomy</td>
<td>12 (5.3)</td>
<td>11 (4.8)</td>
</tr>
<tr>
<td>Conversion</td>
<td>24 (10.7)</td>
<td>30 (13.2)</td>
</tr>
<tr>
<td>Time in theatre (min)*</td>
<td>193 (58)</td>
<td>185 (45)</td>
</tr>
<tr>
<td>Missing</td>
<td>56</td>
<td>55</td>
</tr>
<tr>
<td>Blood loss (ml) φ</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Missing</td>
<td>93</td>
<td>81</td>
</tr>
<tr>
<td>Pathological stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (T1 2 NO M0)</td>
<td>73 (32.0)</td>
<td>63 (27.8)</td>
</tr>
<tr>
<td>II (T3 4 NO M0)</td>
<td>76 (33.3)</td>
<td>68 (30.0)</td>
</tr>
<tr>
<td>III (T2–4 N, M0)</td>
<td>70 (30.7)</td>
<td>85 (37.4)</td>
</tr>
<tr>
<td>YpT0 M0</td>
<td>1 (0.4)</td>
<td>3 (1.3)</td>
</tr>
<tr>
<td>pT0 (dysplasia)</td>
<td>8 (3.5)</td>
<td>8 (3.5)</td>
</tr>
<tr>
<td>Health-related quality of life baseline*</td>
<td>0.88 (0.16)</td>
<td>0.89 (0.15)</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages unless indicated otherwise; values are
*mean(s.d.) and φmedian. SDD, selective decontamination of the digestive tract.

### Table 2

Multiply imputed mean effects and costs by group and mean difference at 3
months follow-up.

<table>
<thead>
<tr>
<th></th>
<th>Control (n = 228)</th>
<th>SDD (n = 227)</th>
<th>Mean difference (95 % CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infectious complications</td>
<td>0.28</td>
<td>0.15</td>
<td>−0.13 (−0.20; −0.05)</td>
</tr>
<tr>
<td>QALY gained</td>
<td>0.22</td>
<td>0.22</td>
<td>0.002 (−0.002; 0.005)</td>
</tr>
<tr>
<td>Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>0</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>(medication)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical ward</td>
<td>3436</td>
<td>3070</td>
<td>−366 (−936; 203)</td>
</tr>
<tr>
<td>Intensive Care Unit</td>
<td>1095</td>
<td>281</td>
<td>−814 (−1927; −231)</td>
</tr>
<tr>
<td>Reoperation</td>
<td>339</td>
<td>205</td>
<td>−134 (−299; 32)</td>
</tr>
<tr>
<td>Transanal abscess drainage</td>
<td>41</td>
<td>20</td>
<td>−21 (−140; 28)</td>
</tr>
<tr>
<td>Radiological drainage</td>
<td>6</td>
<td>2</td>
<td>−4 (−18; 2)</td>
</tr>
<tr>
<td>Total healthcare costs per patient</td>
<td>4918</td>
<td>3660</td>
<td>−1258 (−2751; −166)</td>
</tr>
</tbody>
</table>

Values are measured in euros. Index operation costs and intravenous antibiotic prophylaxis are the same for both groups and are therefore not shown.

a Mean effect difference was adjusted by hospital centers.
b QALYs were adjusted by baseline utility values and hospital centers.
c Difference in costs without adjustment for hospital centers.
3.2. Effectiveness

A detailed description of the effectiveness of the SELECT trial has been published previously and is summarized here [2]. A statistically significant difference in the occurrence of infectious complications at 3-month follow-up was found between the intervention and control group (mean difference \(= 0.13, 95\% \text{ CI } -0.20 \text{ to } 0.05\)) (Table 2).

There was no statistically significant difference in QALYs between groups (mean difference \(= 0.002, 95\% \text{ CI } -0.002 \text{ to } 0.005\)) (Table 2).

3.3. Costs

In the intervention group, total healthcare costs were statistically significantly lower than in the control group with a mean unadjusted difference of \(-€1285 \text{ (95\% CI } -2751 \text{ to } -166\) (Table 2). ICU costs were also statistically significantly lower, but were only a relatively small contributor to total healthcare costs. The main contributor in both groups being costs of days admitted to the surgical ward (€3436 in control group vs €3070 in intervention group) (Table 2).

3.4. Cost-effectiveness analysis

The ICER for the prevention of infectious complications was –9872 €/infectious complication prevented indicating that SDD is dominant over control (Table 3). This means that SDD was on average more effective to prevent the occurrence of infectious complications and less expensive than the standard preoperative prophylactic practice alone (Fig. 2A) (see Fig. 1). The probability of the SDD being cost-effective compared to control was 1.0 at all WTP thresholds (Fig. 2B).

Table 3

<table>
<thead>
<tr>
<th>Effect outcome*</th>
<th>Cost difference, € (95 % CI)</th>
<th>Effect difference (95 % CI)</th>
<th>ICER €/effect gained</th>
<th>Distribution of the CE-plane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main analysis</td>
<td></td>
<td></td>
<td></td>
<td>North-East</td>
</tr>
<tr>
<td>Infectious complications</td>
<td>-1253 (-2532; -194)</td>
<td>0.13 (0.05; 0.20)</td>
<td>-9872</td>
<td>0.02</td>
</tr>
<tr>
<td>QALY</td>
<td>-1253 (-2532; -194)</td>
<td>0.002 (-0.002; 0.005)</td>
<td>-820,380</td>
<td>0.01</td>
</tr>
<tr>
<td>SA1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infectious complications</td>
<td>-1296 (-2752; -188)</td>
<td>0.13 (0.05; 0.20)</td>
<td>-1069</td>
<td>0.02</td>
</tr>
<tr>
<td>QALY</td>
<td>-1296 (-2752; -188)</td>
<td>0.002 (-0.002; 0.005)</td>
<td>-577,847</td>
<td>0.01</td>
</tr>
<tr>
<td>SA2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infectious complications</td>
<td>-1447 (-2903; -243)</td>
<td>0.14 (-0.21; -0.06)</td>
<td>-10563</td>
<td>0.02</td>
</tr>
<tr>
<td>QALY</td>
<td>-1003 (-2240; 55)</td>
<td>0.003 (-0.001; 0.006)</td>
<td>-373,330</td>
<td>0.03</td>
</tr>
</tbody>
</table>

ICER, Incremental cost effectiveness ratio; CE-plane, cost-effectiveness plane; QALY, Quality-adjusted life-years; SA1, sensitivity analysis based on the seemingly unrelated regressions model (SUR); SA2, main analysis including only observations with complete data for infectious complications (n = 402) and for QALY (n = 247).

This was confirmed by the cost-effectiveness plane where most of the bootstrapped cost-effect pairs (98%) were in the South-East quadrant (Fig. 2A).

* The effect outcome occurrence of infectious complication was multiplied by –1 to make the cost-effectiveness plane interpretable.

Fig. 1. CONSORT diagram for the SELECT trial. SDD, selective decontamination of digestive tract; TME, total mesorectal excision.
The ICER for QALYs was €820,380 indicating again that SDD is dominant over control. Again, the majority of the bootstrapped cost-effect pairs (81%) was located in the South-East quadrant of the CE-plane (Table 3) indicating that on average SDD was more effective and less expensive than standard preoperative prophylactic practice alone (Fig. 2C). The probability of the SDD being cost-effective compared to control was 1.0 at all WTP thresholds (Fig. 2D).

3.5. Sensitivity analyses

SA1, using seemingly unrelated regression models, resulted in a similar difference in costs between groups compared to the main analysis (SA1 = €1253 vs main analysis = €1296), while no differences with the main analysis were found for both effect outcomes (Table 3). The distribution of the bootstrapped cost-effect pairs did also not differ between SA1 and the main analysis. SA2, also resulted in a similar difference in costs and effects between groups compared to the main analysis (Table 3). Also, the distribution of the bootstrapped cost-effect pairs did not differ between SA2 and the main analysis.

4. Discussion

This economic evaluation shows that addition of SDD to standard preoperative prophylactic practice results in statistically significantly less infectious complications, and lower costs than standard preoperative prophylactic practice alone. However, there was no clinically relevant difference in QALYs between groups. Cost-effectiveness acceptability planes and curves showed that SDD is dominant over control both for infectious complications prevented and QALYs.

Previous research has shown that the implementation of SDD in the intensive care unit and the surgical field reduces the occurrence of infectious complications significantly compared to standard prophylactic care [2, 8, 29, 30]. Nevertheless, the use SDD in elective CRC surgery is not endorsed by insurance companies, likely due to a lack of economic evaluations. As a result, broad implementation in daily practice is still lacking. Since infectious complications are the main driver of in-hospital healthcare costs after CRC surgery, it is very relevant to also evaluate the cost-effectiveness of SDD [5, 6]. So far, this study is the first to address this research question for elective CRC surgery.

In this context, one cost-effectiveness analysis of the SDD was performed by Dijksman et al., in a single center study [12], concluding that SDD was cost-effective compared to placebo. Important difference with our current study was the inclusion of a large variety of gastrointestinal surgical procedures, rather than CRC surgery only, and the comparison with the standard prophylactic care. A more recently published observational retrospective study by Bogner et al. supports these findings in CRC surgery patients [13]. However, both studies only conducted a cost-effectiveness analysis and not a cost-utility analysis, whereas healthcare decision makers prefer information on health-related quality of life and QALYs specifically [10]. An unexpected finding of the present study was that the cost-utility analysis showed a minimal difference of 0.002 in QALYs favoring the SDD group. This may be explained by the...
fact that both groups already had high health-related quality of life at baseline. Also, the moment of the second measurement of the cost-utility questionnaire could be of importance. Possibly, the impact of post-operative infections is more outspoken in the first few weeks after surgery and this difference in diminished three months after surgery.

One of the strengths of this study is that the economic evaluation was performed alongside a multicenter randomized controlled trial which allows for prospective collection of patient-level data thereby increasing the validity of the results [11]. In addition, our study was based on the results of six different medical centers in the Netherlands, including one university medical center and five teaching hospitals which may increase generalizability of results.

Our study also has several limitations. First, the fact that the study was performed from a healthcare perspective, rather than a societal perspective. A societal perspective includes all relevant costs for decision-making, such as costs associated with loss of productivity and costs of informal care. This data was not collected in this study. Another limitation is the relatively short follow-up period of three months. Collection of data with longer follow-up was not feasible. Finally, the open label character of the original study provides the possibility of certain bias, e.g. the difference in outcome reporting [31].

Despite these limitations and considering the relatively low costs of SDD (approximately €80) in relation to the expected reduction in the occurrence of infectious complications, we recommend to provide SDD as standard prophylactic care in elective CRC surgery. Future studies should evaluate the cost-effectiveness of SDD for other indications, over longer follow-up periods, and from a societal perspective as recommended by the Dutch Health Care Institute [27]. Healthcare systems in other countries evidently differ from the Dutch system. For example, Abd El Aziz et al. report in their study a widespread adaptation in the USA of preoperative oral antibiotics with mechanical bowel preparation in the last decade and reported infectious complications rates are lower than the ones reported in the SELECT-trial [32]. Although this is a retrospective study, its results fuel the necessity of replication of our current study in other countries to confirm cost-effectiveness of SDD prophylaxis in colorectal cancer surgery.

In conclusion, the addition of SDD as an oral antibiotic prophylaxis in elective CRC surgery is dominant in reducing infectious complications compared to standard preoperative antibiotic prophylaxis alone. This finding is highly relevant for the daily clinical use as it is for health insurance policy makers.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

CRediT authorship contribution statement

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

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References


