Appendix 1 – Cost-effectiveness analysis concerning different discount rates for costs and outcomes

Below there is presented and extra analysis including different discounting rates for the costs and the effects as suggested by the implementing regulation issued by the Ministry of Health in Poland [46]. Replacing one discount rate (3.7%) based on the inflation data from the Central Statistical Office of Poland [33] by the 5% discount rate for the costs and 3.5% for the effect [46] brings only slightly different results to the foregoing analysis.

Baseline analysis

No screening

The no-screening scenario resulted in 1126 cases of CRC and 566 deaths because of CRC within the simulated cohort of 100 000 subjects. It resulted in the loss of 11 704 undiscounted life-years. The cost of CRC care and medicines for the patients was $11 071 613 for 100 000 subjects after discounting, which was approximately $110.7 per person (Table S1).

Colonoscopy screening

The colonoscopy screening scenario with adherence of 30% resulted in 914 cases of CRC and 454 CRC-related deaths. This translates into a 19.8% reduction in mortality and 18.9% reduction in incidence. Colonoscopy screening resulted in 1976 discounted life-years saved, which is 7.2 days gained per person. As a screening technique, colonoscopy resulted in a 21.3% reduction in costs for CRC care, which is $27.9 undiscounted savings per person. However, total costs were $12 017 339 higher for colonoscopy screening than no screening due to the costs associated with the screening (Table S1).

Cost-effectiveness

Colonoscopy screening turned out to be a cost-effective scenario with an ICER of $6013 per discounted life-year saved. Although it was not a cost-saving strategy due to the costs associated with the screening, the estimated ICER was still far below all of the analyzed cost-effectiveness thresholds ($50 000, $100 000, $200 000, $46 000 – $70 000). Therefore, compared to the no-screening scenario, colonoscopy allows for a high number of life-years saved at a relatively low and reasonable price.

Sensitivity analysis

Variables that may have had a significant impact on our analysis were level of adherence, CRC incidence and mortality reduction rates, and cost of colonoscopy examination. Conducting probabilistic analysis using Monte Carlo simulation with 100 000 iterations, we achieved a mean ICER of $5966 per discounted life-year saved (95% CI $3757-$9344). These results confirmed the use of colonoscopy as a cost-effective strategy, as the obtained values for the ICER were still

far below the accepted willingness-to-pay thresholds ($50 000, $100 000, $200 000, $46 000 –

$70 000).

The most important uncertain variables, i.e., had the most serious impact on the results of

the model, were the rate of adherence, mortality reduction rate, incidence reduction rate, and cost

of colonoscopy examination (Figure S1).

Table S1. Costs and effects of colonoscopy screening vs. no screening in the base case scenario assuming different discounting rates for the costs and the effects.

	No screening	Colonoscopy
CRC cases, n	1126	914
CRC deaths, n	566	454
CRC prevented, %	-	18.9%
CRC deaths prevented, %	-	19.8%
Life-years lost, n	11 704	9387
Life-years saved, n	-	2317
Life-years saved discounted, n	-	1976
Cost CRC care, $	13 076 409	10 290 580
Cost screening, $	-	14 803 168
Total cost, $	13 076 409	25 093 748
Total cost discounted, $	11 071 613	22 953 686
ICER *vs* no screening, $ per life-year saved (discounted)	-	6013

Abbreviations: CRC, colorectal cancer; ICER, incremental cost-effectiveness ratio

Figure S1. Tornado diagram of differences in ICER according to the variables used in the sensitivity analysis assuming different discounting rates for the costs and the effects.
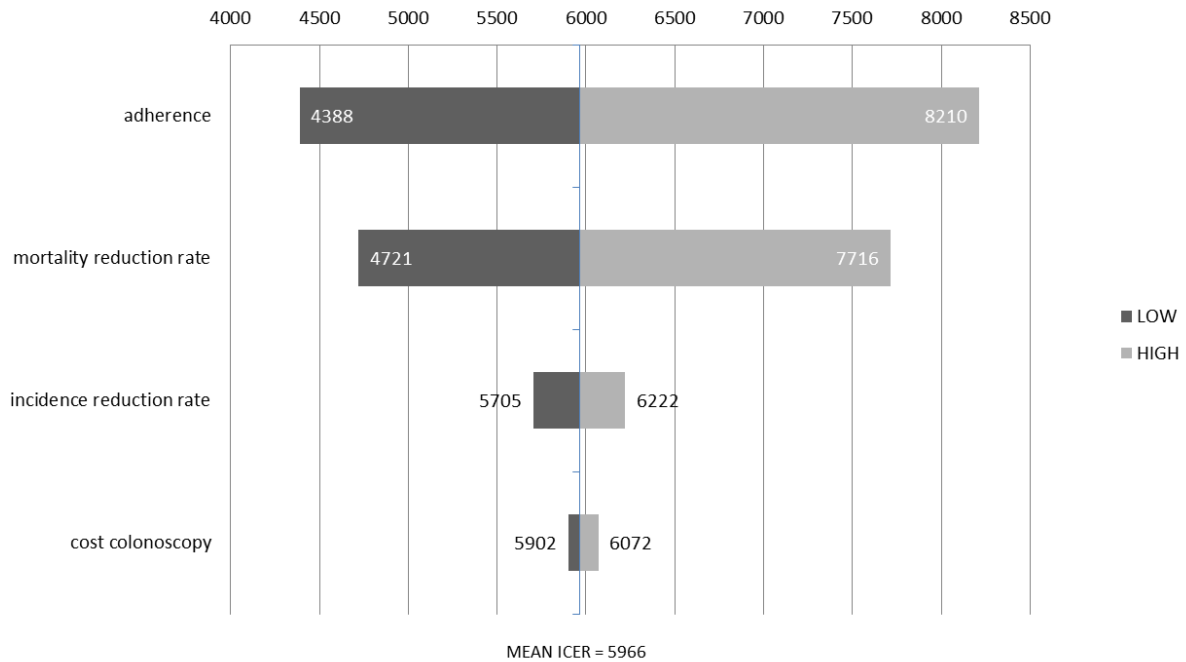
Where:

LOW – indicates lower values of ICER than the mean value obtained in the probabilistic analysis.

HIGH – indicates higher values of ICER than the mean value obtained in the probabilistic analysis.