

BACKGROUND AND OBJECTIVES

- Ostomy for fecal diversion is associated with a substantial long-term cost burden
- In the UK, £233.5 million is spent annually on products for stoma care alone
- Our objectives were
 - To assess the patient-level ostomy-associated costs in the UK;
 - To explore the potential impact of new approaches to avoid the necessity for a diverting ostomy after rectal cancer resection

METHODS

- We developed a Markov model to estimate the lifetime cost of stoma care post rectal resection
- Patient characteristics were based on a retrospective cohort study¹ (age 65 years, 49.8% female)
- Cohort survival was taken from the English cohort of a population-based study with data from 2010-12²
- Monthly stoma care costs were derived from NHS guidelines for stoma product prescriptions; see Table 1 for assumed utilization and resulting costs
- We assumed that 80% of the stomas would be reversed in a take-down procedure within the first year while the remaining ostomies were permanent
- Stoma take-down costs were based on 2017-18 NHS Reference Costs for England
- Conservatively, we did not consider cost of potential adverse events experienced by stoma patients
- All costs were calculated over the patient’s lifetime, discounted at 3.5% p.a.
- Sensitivity analysis was performed to evaluate the effect of changes in assumptions

Table 1. Description, Assumed Utilization, and Costs for Stoma Care Items

Item Description	Units/month	Unit Costs	Monthly Costs
Stoma Care Appliance Items			
Colostomy bags (one-piece systems)	60	£2.37	£142.18
Colostomy bags (two-piece systems)	60	£1.43	£85.53
Colostomy flanges	15	£3.41	£51.11
Ileostomy bags (one-piece systems)	20	£3.03	£60.66
Ileostomy bags (two-piece systems)	20	£3.03	£60.66
Ileostomy flanges	15	£3.41	£51.11
Stoma Care Accessory Items			
Flange extenders (for all systems)	3	£11.60	£34.80
Belts (for convex pouches)	0.25	£3.34	£0.84
Support belts	0.25	£3.34	£0.84
Adhesive removers	2	£11.01	£22.02

Table 2. Other Model input parameters.

Parameter	Value	Reference/Comment
Patient Characteristics		
Age	65.0	Sheetz et al. 2014 ¹
Female gender	49.8%	Sheetz et al. 2014 ¹
Proportion ileostomy (vs. colostomy)	50%	Assumption
Proportion of stomas reversed at mo.9	80%	Assumption
Proportion of one-piece systems	60%	Assumption
Mortality Parameters		
Background mortality		2014-16 Lifetables for England
Weighted hazard ratio	11.04	Calculated from Majano et al. 2019 ²
Cost and Discounting Parameters		
Costs for Stoma Reversal procedure	£7,916	NHS England 2017/18 reference costs; assumes complex large intestinal procedure, 19yrs and over, with CC score 0-2
Annual discount rate for costs	3.5%	NICE guidelines

RESULTS

- In the base case, the lifetime costs of stoma management post colorectal surgery were £8,960 per stoma patient
- For patients in whom stoma was reversed, lifetime costs were £8,755, while costs for a permanent stoma surpassed the reversal after around eight years, for a total of £9,779 over lifetime; see Figure 1 for the cost build-up over time by scenario

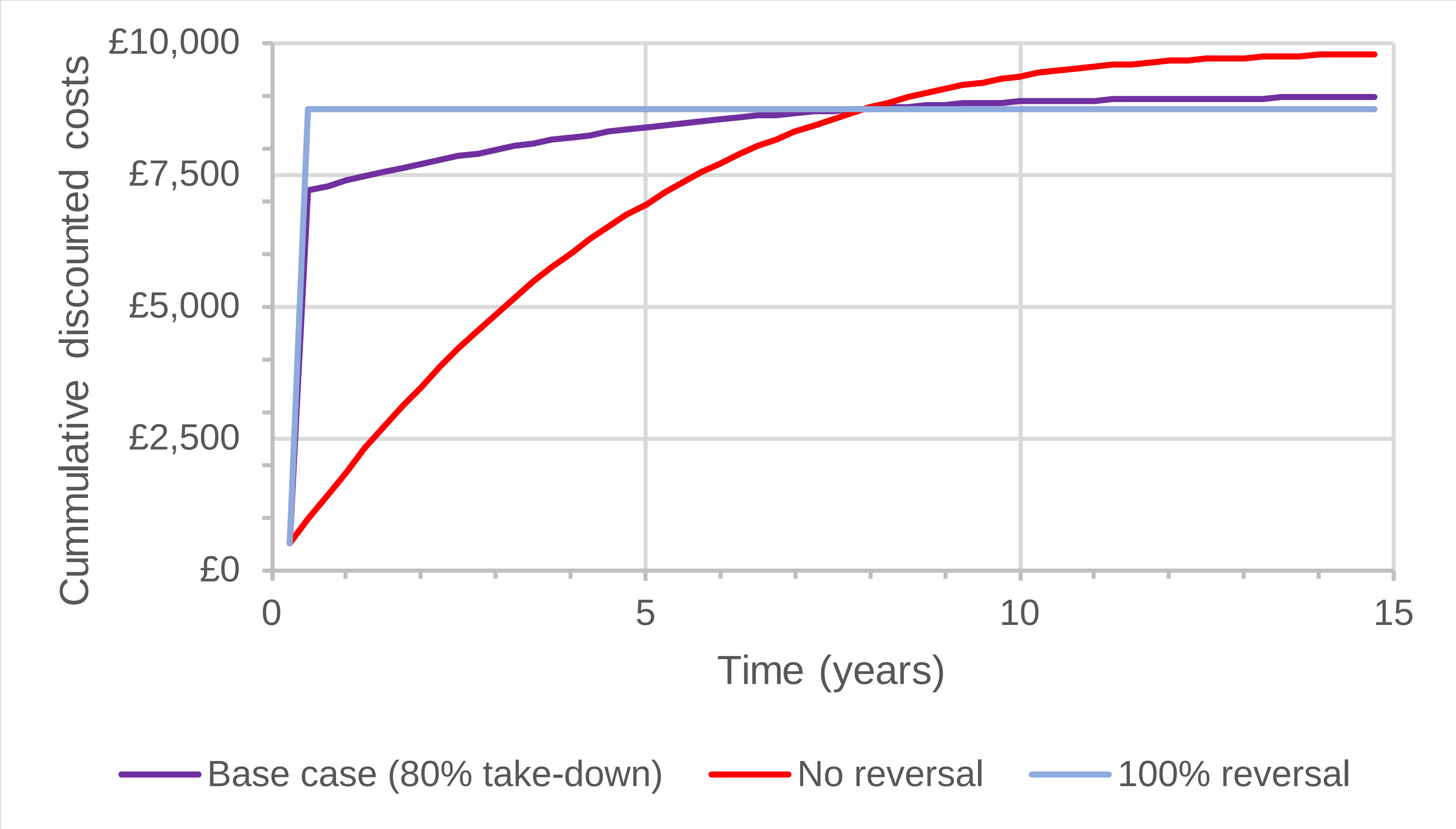


Figure 1. Cumulative Discounted Costs Over Time By Stoma Reversal Scenario

- Figure 2 shows a tornado diagram summarizing the sensitivity analyses:
 - Long-term survival after cancer surgery influenced costs most substantially if considering a wide range of reported survival (85% vs 22% projected 5-yr. survival based on ³ and ⁴ (mortality HRs 2.7 and 21.8%)
 - Similarly, costs were higher in patients at younger disease onset/treatment age
 - The proportion of stoma reversal had a slightly smaller impact, followed by the proportion of ileostomy vs. colostomy
 - Varying the discounting rate had a moderate impact on costs

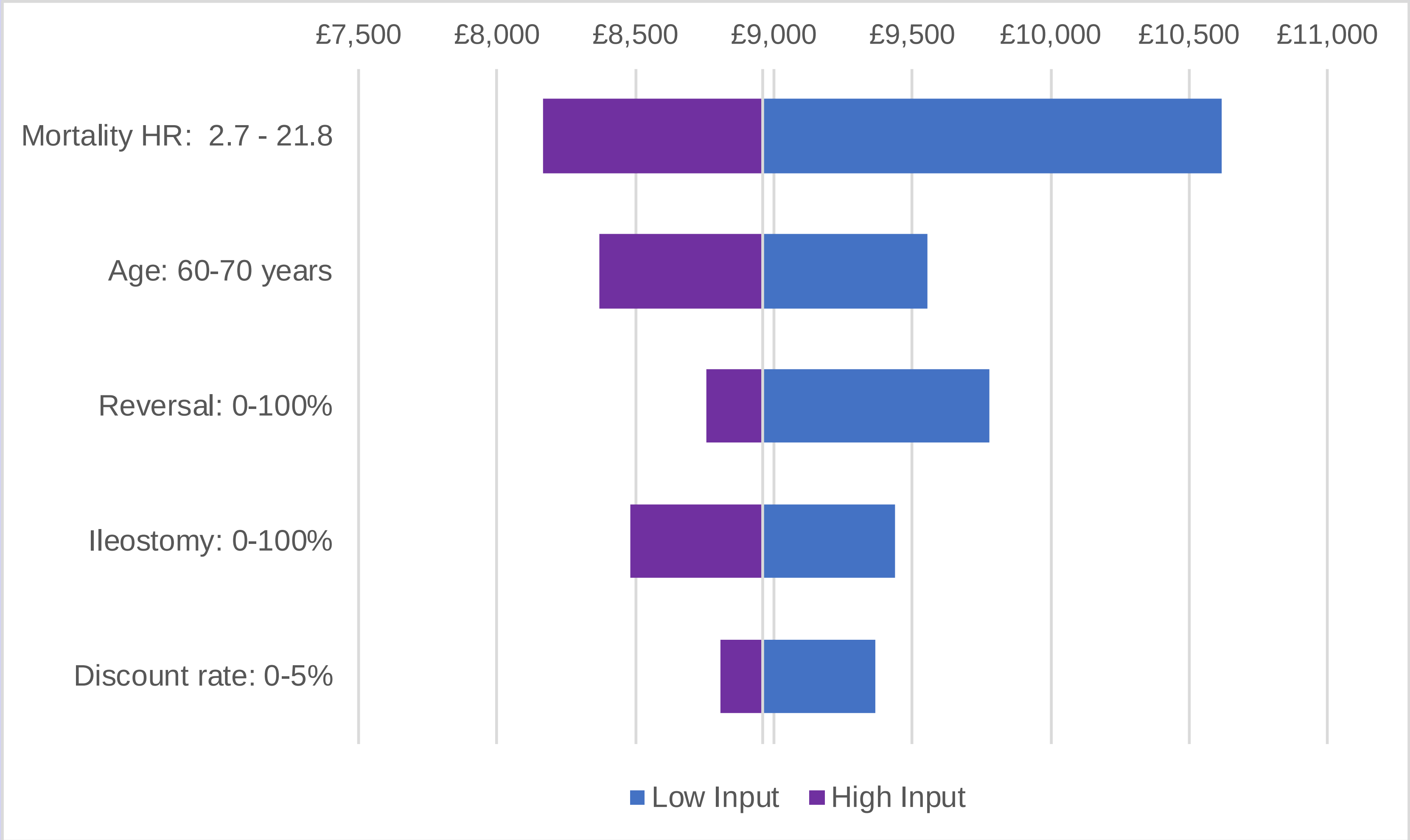


Figure 2. Tornado Diagram on the Impact of Input Parameters on the Total Cost

CONCLUSIONS

- Our model-based projections suggest placement of an ostomy after rectal cancer resection is associated with substantial long-term costs in the NHS
- New techniques or devices that could safely avoid the stoma placement could meaningfully reduce long-term care costs

References

[1] Sheetz KH *et al. Dis Colon Rectum* 2014(57): 632-7
[2] Majano SB *et al. Lancet* 2019; 20:74-87
[3] Benz S *et al. Surg Endosc.* 2017 Jun;31(6):2586-2595. d
[4] Data derived from *SEER Incidence Database* <https://seer.cancer.gov/data/> for higher-stage rectal adenoca (this value was used for initial abstract, leading to lifetime cost estimate of £8,167)

Disclosures

Wing Tech Inc. (Drs. Pietzsch and Geisler) provided consulting services to SafeHeal SAS to conduct health-economic analyses in the current study.