

Budget impact of capsule endoscopy for Crohn's disease management in Spain

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Background

- Crohn's disease (CD) affects the digestive tract and can be present in either the colon, the small bowel, or both
- Appropriate management of CD requires evidence from endoscopic surveillance
- In Spain, colonoscopy± magnetic resonance enterography is generally the standard of care (SoC) for surveillance
- A shortcoming of SoC is the difficulty in visualizing the mucosa of the small bowel which is affected in 50.5%¹ of CD patients
- Pan-intestinal video endoscopy (PVCE) allows for visualization of both the colon and small bowel in one exam, but the cost impact of introducing PVCE in Spain is unknown.

Methods

- A published patient-level model was adapted to the Spanish setting using inputs from a clinician panel and country-specific published literature (**Fig. 1**)
 - If no local data were available, data gaps were filled using European data or meta-analysis
- A cohort of 4,000 patients with CD was generated and entered the CD surveillance care pathway at 1-year post-diagnosis
- Disease progression was modelled via underlying Markov model
- Using SoC in all patients (**SoC group**) was compared to using PVCE (+patency capsule) for monitoring of patients with CD that impacts the small bowel (**Intervention group**). All other patients still received SoC
 - Patients were switched to PVCE only after positive diagnosis of CD in the small bowel
- The difference in costs between surveillance methods was assessed over a time horizon of five years
- Median (95% credible interval) costs were calculated from bootstrapped populations, with this performed 1,000 times

Conclusion

- Targeted use of PVCE is likely to reduce the cost of CD monitoring and patient management for hospitals
- Switching from SoC to PVCE may lead to reductions in surgery in these patients

Results

- In the **Intervention group** 1,888 patients (47% of the population) received one or more PVCE procedures over the 5 years
- The average cost of care over all 4,000 patients was lower in the **Intervention group** than in the **SoC group** the average saving was EUR 50 (-358 to 456) per patient over 5 years
- Only considering the patients switched to PVCE, (i.e. ignoring patients that had SoC in both arms) the saving per patient receiving PVCE was EUR 759 (-44 to 1,548) over 5 years
- In 61% of bootstrapped populations PVCE reduced costs
- A key driver was reduced need for surgery (**Fig.2**), which decreased by 3.3% if PVCE was used.
- Introduction of PVCE in the **Intervention group** resulted in per patient cost increases and cost savings occurring at a similar rate (**Fig.3**)
 - Where costs savings occurred, they were generally larger than cost increases (**Fig. 3**)
 - This was likely due to avoided surgeries

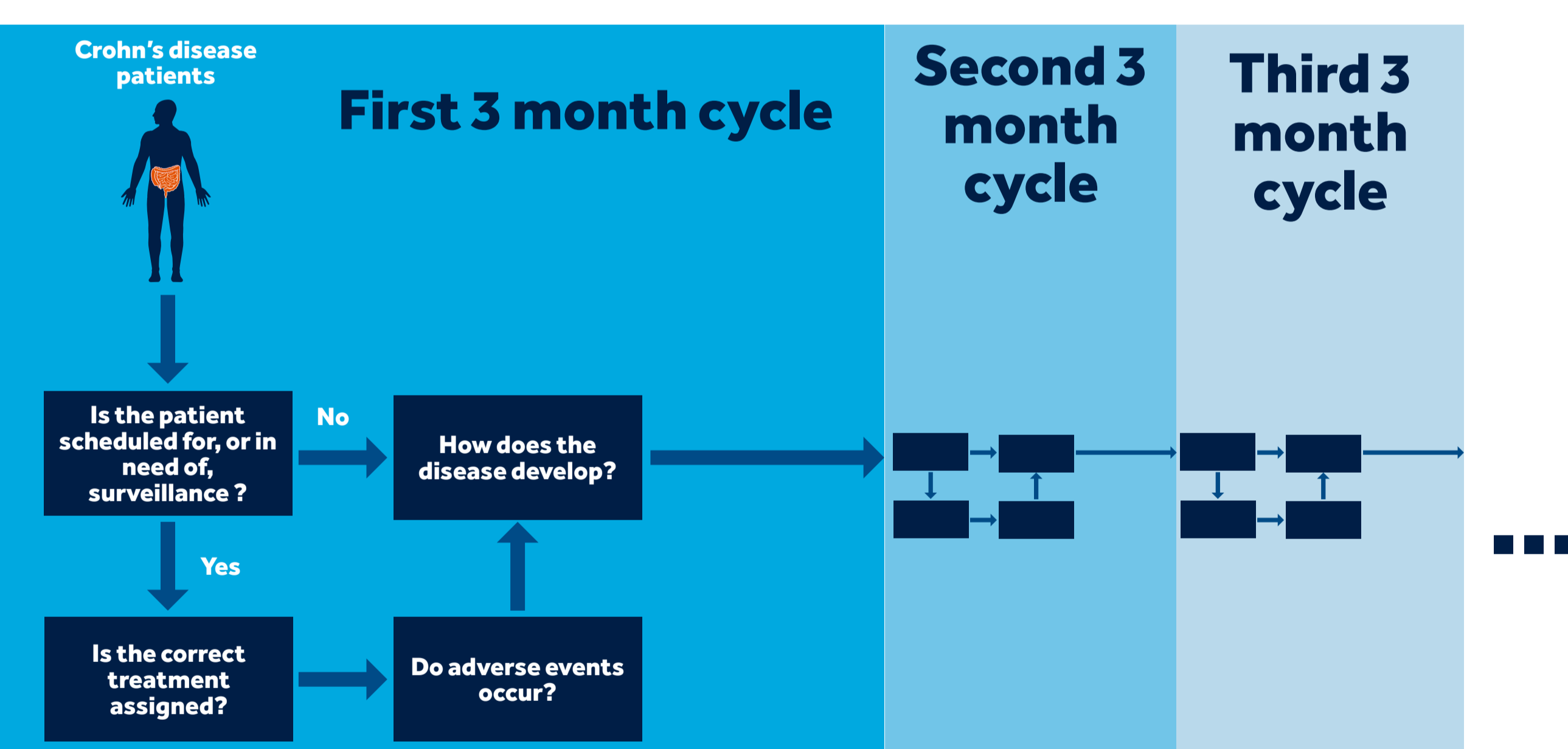


Fig.1 Model flow The model is based on 3-month cycles, which repeat until the model time horizon is reached. In each cycle patient characteristics progress and disease state can evolve. The patient's progression is linked to a percentage chance from published literature, modulated for any patient characteristics that are risk factors for that event.

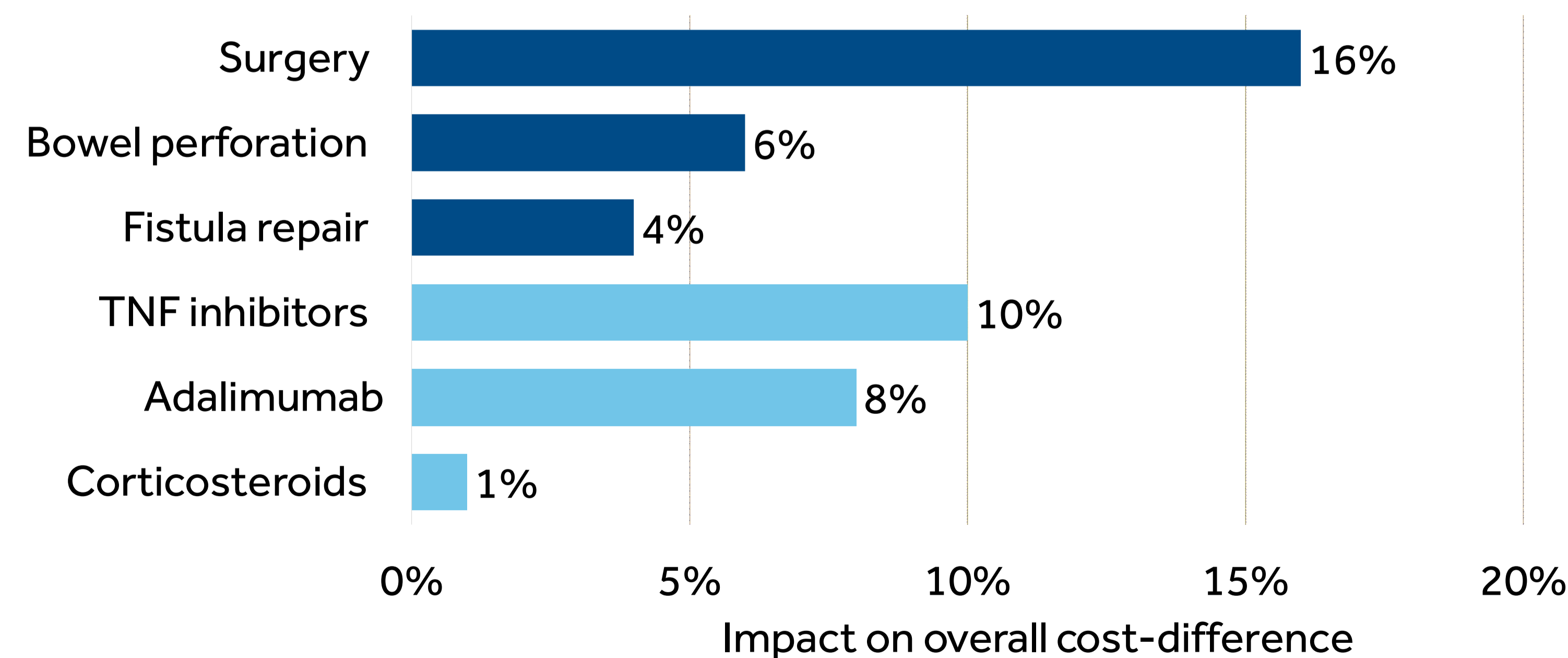


Fig.2 Major cost drivers Impact of a 20% cost change in individual parameters on the overall cost-difference between scenarios. **Dark blue** represents the top three cost drivers among adverse events. **Light blue** represents the top three cost drivers among medications

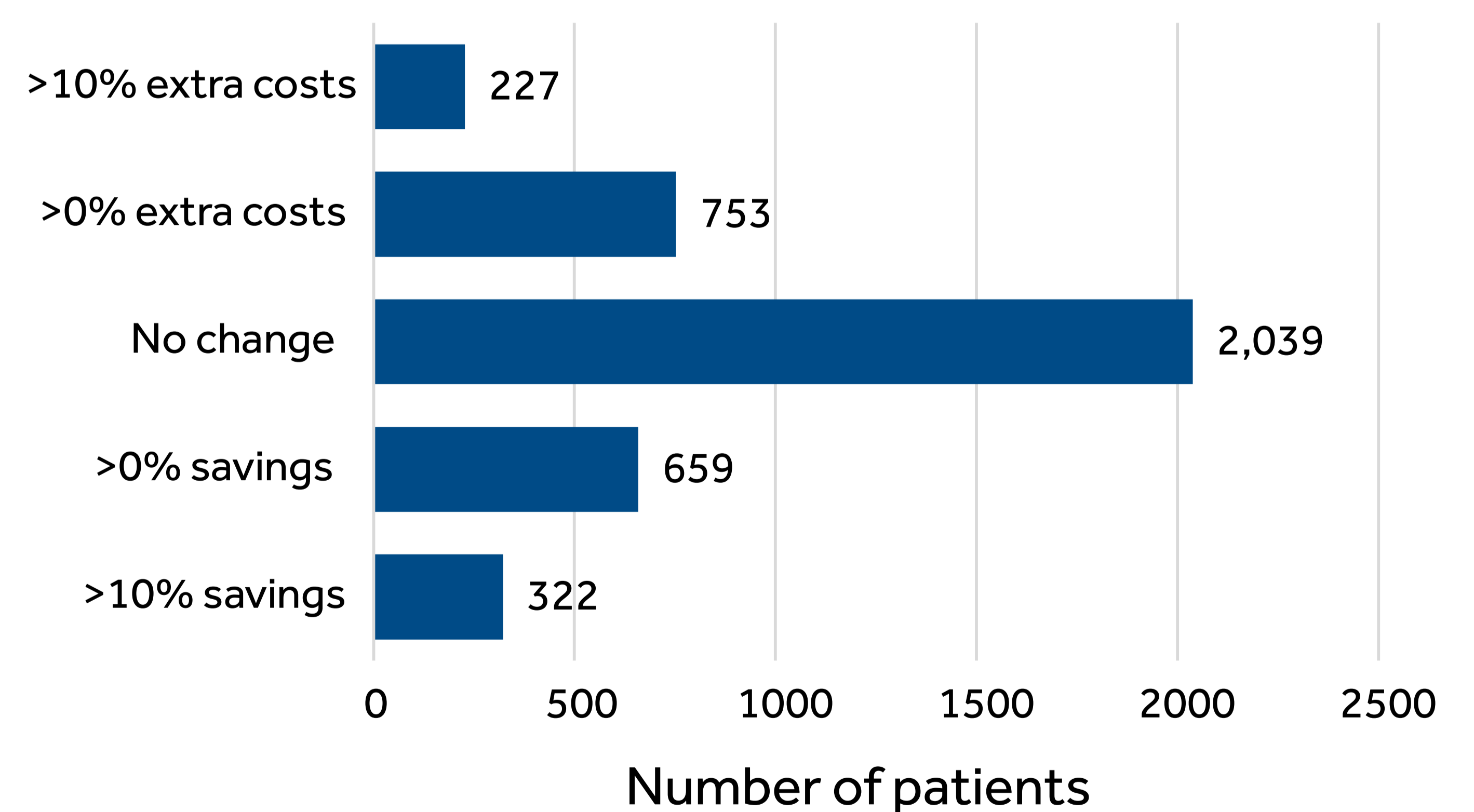


Fig.3 Distribution of cost relative cost changes 51% (2,039) of patients display no change of costs between the **Intervention group** and **SoC group**, receiving SoC in both arms. PVCE was cost saving in 24.5% (981) of cases. Similarly, PVCE caused additional costs in 24.5% (980) cases. While the number of patients in both groups was equivalent, savings were generally higher than extra costs.

References

1. Casellas et al. Costes médicos directos de la enfermedad de Crohn en España. PharmacoEconomics Spanish Res Artic. 2010;7(1):38-46