

Cost-effectiveness Analysis of Endoscopic Sleeve Gastroplasty

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KEY POINTS

Question: Is endoscopic sleeve gastroplasty cost-effective for patients with obesity with and without type 2 diabetes?

Findings: At 5 years, endoscopic sleeve gastroplasty in obese patients with or without type 2 diabetes (T2DM) was cost-effective. For a lifetime horizon, endoscopic sleeve gastroplasty was cost-saving in obese patients with T2DM and was still cost-effective in obese patients without T2DM.

Meaning: Endoscopic sleeve gastroplasty could be cost-effective to payers in patients with obesity and type 2 diabetes and should be a viable option for obesity management.

INTRODUCTION

Obesity continues to increase at an alarming rate. Endoscopic sleeve gastroplasty (ESG), a minimally invasive endoscopic weight loss procedure, has been shown to produce effective weight loss and improvement in obesity-related disease; however, it is unclear whether ESG is cost-effective.

The objective of this study is to assess the cost-effectiveness of ESG for weight loss as compared to no weight-loss intervention in patients with a BMI ≥ 30 kg/m² with or without type 2 diabetes (T2DM), one of the most common obesity-related chronic conditions with costly management and a considerable impact on patient health and wellbeing.

METHODS AND MATERIALS

A decision analytic model with time horizon of 5 years and lifetime, respectively, from a health system's perspective was constructed to compare ESG to no weight loss intervention (no ESG) in obese patients aged 35-45 years with a body mass index (BMI) ≥ 30 kg/m² with or without T2DM.

Parameters including probabilities and utility weights were obtained based on published meta-analyses and retrospective studies. Costs were taken from institutional data and were evaluated in 2022 U.S. dollars (2022\$). Life expectancy with or without T2DM was obtained from a prospective cohort study. One-way and two-way sensitivity analyses were performed to evaluate the impact of variations in the probability of T2DM resolution following ESG as well as variations of the cost of ESG.

RESULTS

Main Outcomes and Measures: Quality-adjusted life-years (QALYs), cost (in 2022\$), and incremental cost-effectiveness ratios (ICERs) were calculated.

For the 5-year time horizon in patients with T2DM, ESG produced 4.28 QALYs and incurred a total cost of \$77,874, compared to 3.99 QALYs and a total cost of \$73,738 for no ESG, resulting in an ICER of \$13,922 per QALY gained. For the lifetime horizon, ESG produced 29.57 QALYs and incurred a lifetime cost of \$451,261, compared to 26.69 QALYs and incurred a lifetime cost of \$493,806 for no ESG, resulting in a negative ICER (i.e., cost-saving). The 5-year time horizon in patients without T2DM demonstrated that ESG produced 4.42 QALYs, compared to 4.08 QALYs with no ESG, resulting in an ICER of \$39,116 per QALY gained. For the lifetime horizon ESG produced 34.21 QALYs, compared to 31.60 QALYs for no ESG, resulting in an ICER of \$4,752.

Figure 1. Decision analytic model

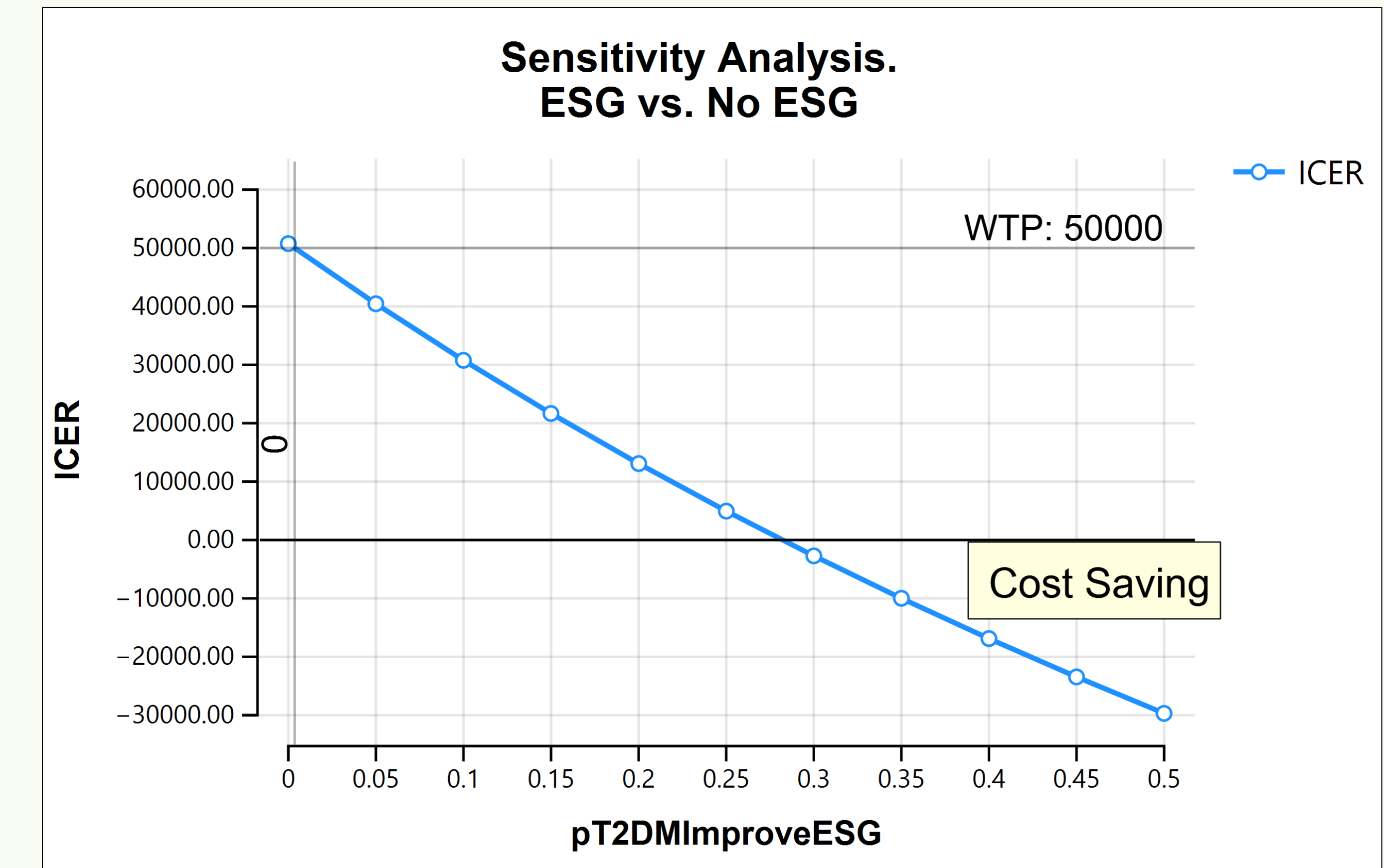
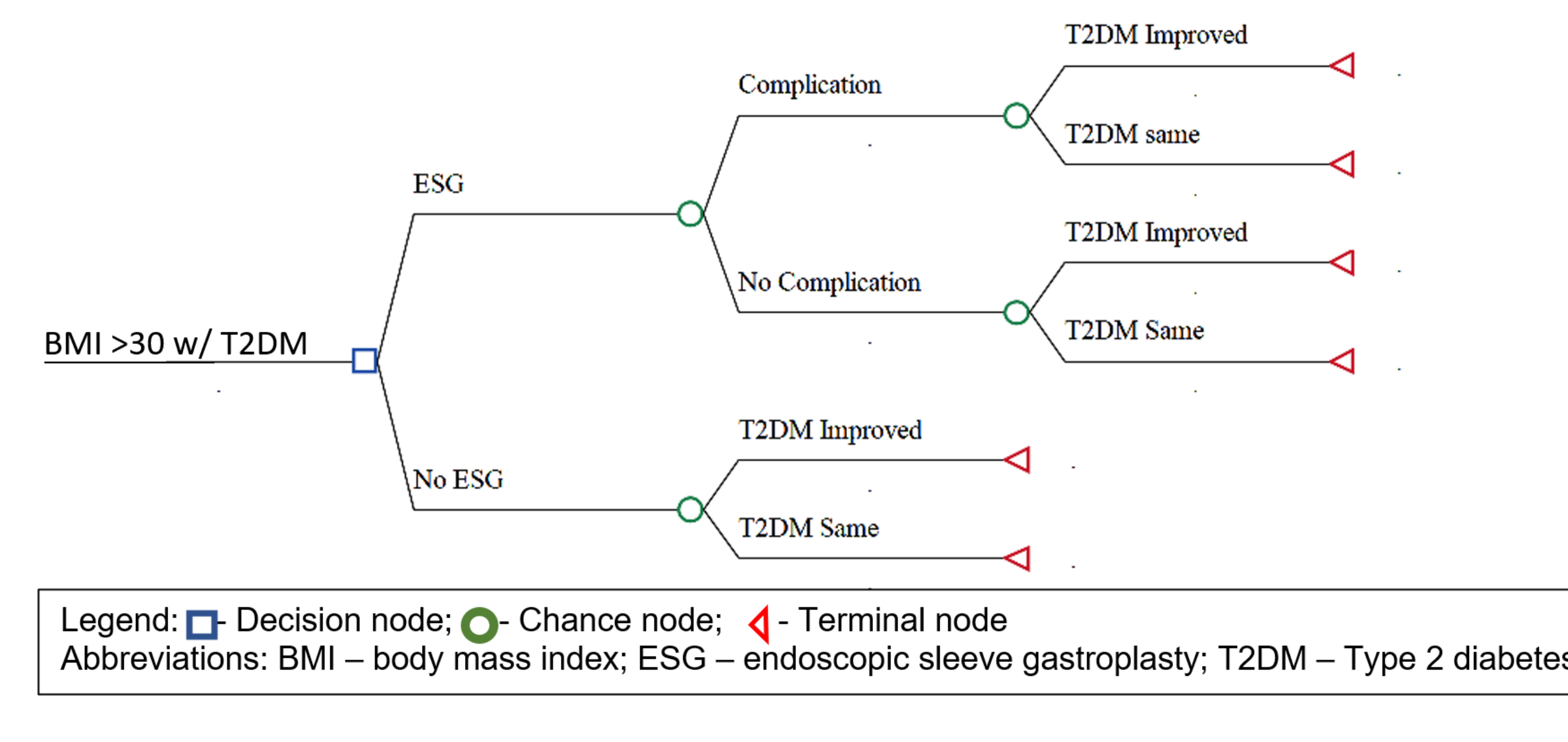


Figure 2. One-way sensitivity analysis with a willingness to pay threshold (WTP) of \$50,000. Abbreviations: ESG- endoscopic sleeve gastroplasty; ICER – incremental cost effectiveness ratio; pT2DMImproveESG – probability of T2DM following ESG

CONCLUSIONS

This cost-effectiveness analysis suggests that ESG is cost-effective in 5 years and cost-saving over a lifetime for patients with obesity and type 2 diabetes.

ESG remains cost-effective at 5 years and over a lifetime in patients without T2DM.

DISCUSSION

The recognition of the safety of the procedure is an important step in its widespread adoption in the United States. The next steps include long term studies that evaluate the effectiveness of the ESG procedure over more than five years.