

# Short-Term Cost and Health Outcomes Comparison of Semaglutide Versus Tirzepatide in Patients with Type 2 Diabetes Mellitus in Colombia

Alexander Moreno-Calderón, PhD · Diana Correa-Serna, MD, MSc · Andrés García-Cuevas, PhD | Novo Nordisk, Bogotá, Colombia

EE8

## Introduction

**Type 2 diabetes mellitus (T2D)** imposes a growing **clinical and economic burden in Colombia**. Diabetes and its complications - including cardiovascular disease, stroke, and chronic kidney disease (CKD) - represent the highest-cost conditions according to "La Cuenta de Alto Costo".<sup>4</sup>

On the other hand, **the Colombian HTA landscape is shifting**. Since Law 1438/2011 mandated evidence-based technology evaluation and IETS published its 2014 Economic Evaluation Manual requiring QALY-based cost-utility analyses, Colombia appeared set on a conventional HTA trajectory (1,2). A decade later, structural reform debates, **escalating EPS insolvency** (USD 8,225 billions in debt by 2024), and a legislative shift toward therapeutic value categories under Law 1753/2015 have reconfigured what evidence is both feasible and sufficient (3,5,6). **Short-term cost-outcome evidence is now the operational standard** for inclusion and guideline decisions in Colombia.

Given the above, in this context—and particularly in the case of diabetes—**short-term cost-outcome evidence, such as cost per unit of HbA1c reduction, weight loss, and avoided major events**, has become the standard of reference for HTA discussions and a key criterion in decision-making within Colombian institutions.

## Objective

The aim was to compare short-term costs and health outcomes associated with semaglutide and tirzepatide in patients with type 2 diabetes mellitus (T2D) from the perspective of the Colombian healthcare system.

## Methods

### Study design

Short-term comparative economic evaluation of commercially available semaglutide and tirzepatide formulations for adult T2D patients in Colombia.

**Semaglutide**  
Injectable 1 mg  
1 pen/month

**Tirzepatide**  
Injectable 5 mg  
4 vials/month

**Semaglutide**  
SUSTAIN program (glycemic/weight), SOUL trial (CV outcomes), FLOW trial (renal outcomes, 2-year follow-up)

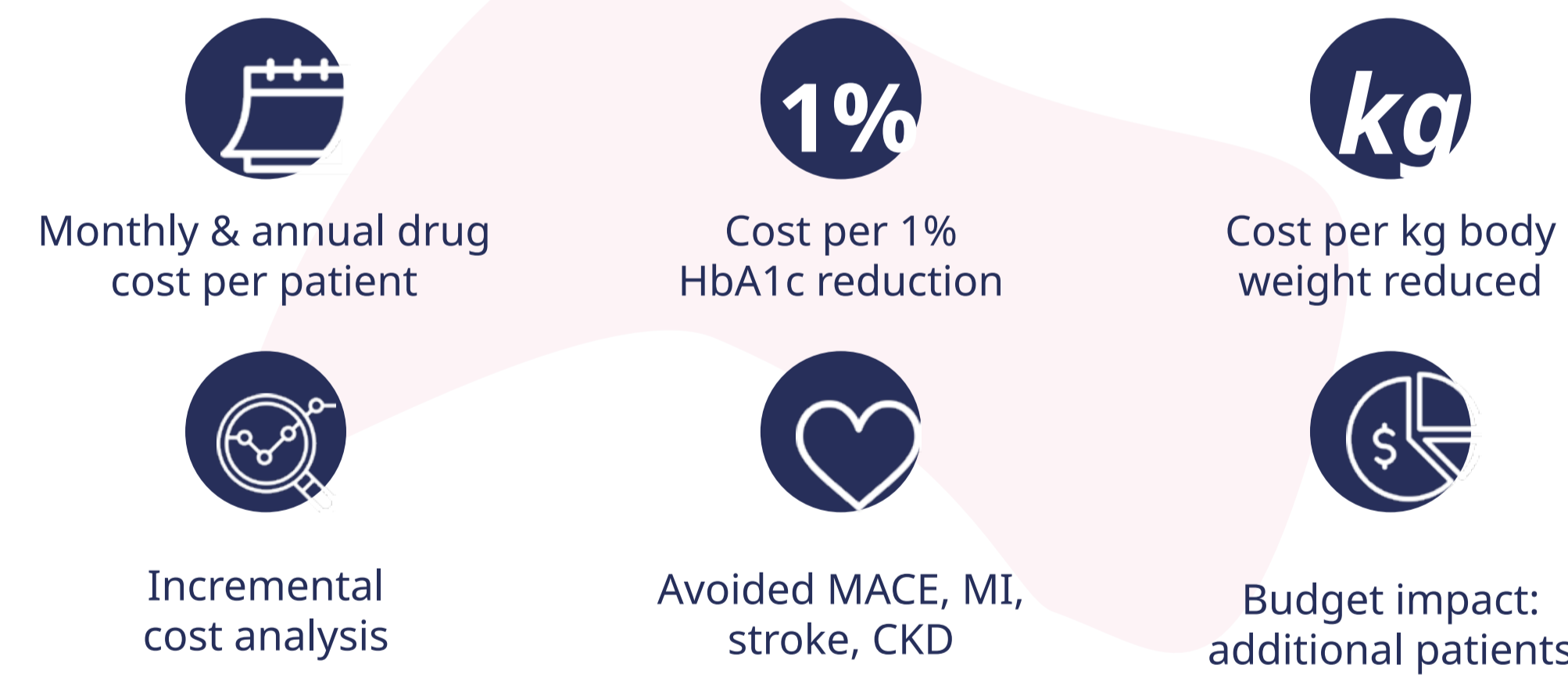
**Clinical efficacy sources**

### Tirzepatide

SURPASS program (glycemic/weight only for available doses)

**Dose selection rationale:** At the time of analysis (2025), only tirzepatide 2.5 mg and 5 mg were commercially available in Colombia. Higher doses (10 mg, 15 mg) had not yet received local distribution approval. For tirzepatide 5 mg, **no published evidence existed for reduction in hard cardiovascular or renal endpoints** (MACE, MI, stroke, CKD).

### Outcomes measured



### Cost data sources

National tariff manuals · Public market prices (SISMED) · Published literature · Cuenta de Alto Costo event unit costs  
**Currency:** USD (1 USD = 4,000 COP, 2025)  
**Perspective:** Colombian payer (SGSSS)  
**Time horizon:** Short-term (1 year for costs; 2 years for events)  
**Discounting:** Not applicable

### Sensitivity analysis

Deterministic sensitivity analyses (DSA) on unit costs, clinical efficacy parameters, and event rates.

## Results

**Table 1 Annual Cohort Cost Comparison (1,000 patients)**

|   |                      |
|---|----------------------|
| <b>Semaglutide</b><br>1 mg                    | <b>USD 1,647,000</b> |
| <b>Tirzepatide</b><br>5 mg                    | <b>USD 2,804,000</b> |
| Monthly cost: Sema USD 137 · Tirz 5mg USD 234 |                      |

**Table 2: Cost per Patient per Year & per Unit of Benefit**

| Metric              | Sema 1 mg | Tirz 5 mg | Δ%        |
|---------------------|-----------|-----------|-----------|
| Annual cost/patient | USD 1,647 | USD 2,805 | 70% lower |
| Cost / 1% HbA1c ↓   | USD 915   | USD 1,395 | 53% lower |
| Cost / kg weight ↓  | USD 253   | USD 369   | 46% lower |

**Incremental analysis (Sema vs Tirz 5mg):** Semaglutide saves **USD 1,158/patient/year** at a marginal efficacy difference of -0.2 pp HbA1c and -1.1 kg weight (in favor of tirzepatide).

**Table 3: Avoided Major Clinical Events — Semaglutide (2-year, n=1,000)**

No equivalent evidence available for tirzepatide 5 mg (no published CV/renal outcomes trial at time of analysis)

| Endpoint                 | Events Avoided | Cost Offset (USD)  |
|--------------------------|----------------|--------------------|
| MACE-3 (total)           | 23             | -                  |
| Myocardial infarction    | 10             | 97,198             |
| Stroke (ACV)             | 10             | 43,567             |
| CKD progression          | 45             | 431,521            |
| <b>Total cost offset</b> | -              | <b>USD 572,286</b> |

**USD 572**

**Average cost offset per patient (2-yr)**

*CKD events represent 75% of total offset (45 events avoided)*

### Budget Impact - Annual Cohort Savings

**+703**

additional patients treatable at semaglutide cost with savings from 1,000-patient cohort  
**Total reach: 1,703 patients · same budget envelope**

### Sensitivity Analysis:

All primary findings were robust across deterministic sensitivity scenarios. Cost advantage of semaglutide maintained under all unit cost, efficacy, and event rate variations tested.

## Discussion

Semaglutide 1 mg demonstrated substantially more favorable short-term economic value compared to tirzepatide 5 mg across all metrics evaluated. The annual per-patient cost advantage of **USD 1,158 (70% lower)** is clinically and policy-relevant in a healthcare system under sustained fiscal pressure.

The **cost-per-unit-of-benefit** differentials - 53% lower per 1% HbA1c reduction and 46% lower per kg weight reduced - **confirm that semaglutide's economic advantage** persists even after accounting for tirzepatide's marginally superior efficacy profile at the 5 mg dose.

The **CKD offset dominates the avoided-event analysis** (75% of total), which is particularly relevant for Colombia: the Cuenta de Alto Costo documents severe CKD underdiagnosis (~10% estimated true prevalence vs. 1.9% diagnosed), meaning the real renal burden - and potential cost offset - **may be substantially larger than modeled**.

The absence of hard-endpoint trial evidence for tirzepatide at commercially available doses in Colombia (2.5 mg, 5 mg) is a critical asymmetry in the evidence base. Payers and guideline bodies cannot assume cardiovascular or renal protection equivalence in the absence of outcomes data.

The budget impact finding - **703 additional patients treatable** with the annual cost savings from switching 1,000 patients to semaglutide — **directly addresses Colombia's coverage expansion imperative amid financial sustainability constraints**.

## Conclusion

**1** Semaglutide 1 mg is associated with **70% lower annual per-patient cost** compared to tirzepatide 5 mg, the highest commercially available dose in Colombia at time of analysis (2025).

**2** Cost efficiency advantages extend to **53% lower cost per 1% HbA1c reduction and 46% lower cost per kg weight reduced**, demonstrating value superiority per unit of clinical benefit.

**3** Semaglutide is supported by evidence of hard endpoint reduction (SOUL, FLOW) with **23 MACE-3 events and 45 CKD events avoided** per 1,000 patients over 2 years, generating ~USD 572/patient in cost offsets. No equivalent evidence exists for tirzepatide 5 mg.

**5** Results are **transferable to comparable middle-income settings** undergoing similar HTA framework transitions and facing healthcare system financial sustainability challenges.

**4** Within the context of Colombia's HTA evolution - from QALY-centric frameworks toward short-term value categorization under Law 1753/2015 - these findings **directly align with current IETS decision frameworks** for reimbursement and formulary positioning.

1. Colombia. Ley 1438 de 2011. Diario Oficial 47.957. [IETS creation & mandate]; 2. IETS. Manual metodológico para evaluaciones económicas en salud. Bogotá: IETS; 2014; 3. IETS. Manual metodológico — categoría de valor terapéutico. Ley 1753/2015, Art.72. 2023; 4. Cuenta de Alto Costo. Informe ERC y enfermedades de alto costo. Colombia; 2024; 5. Marin-Pineda et al. Health insurance premium in Colombia 2025. Health Econ Rev. 2025; 6. Colombia Reports. EPS debt rises to COP 32.9 trillion in 2024. July 2025; 7. Poulter N et al. SOUL trial. N Engl J Med. 2024. [Semaglutide CV outcomes, T2D]; 8. Perkovic V et al. FLOW trial. N Engl J Med. 2024. [Semaglutide renal outcomes]; 9. Frias JP et al. SURPASS program. N Engl J Med. 2021. [Tirzepatide efficacy]; 10. INAHTA. IETS profile. 2024. [Budget: USD 2M, 36 staff]

## References