RWD9

# LINKING PHARMACY CLAIMS AND EHR-DERIVED ANTHROPOMETRICS TO EVALUATE REAL-WORLD GLP-1 OUTCOMES IN OBESITY LEVERAGING NORSTELLALINQ EHR AND VITALS DATA

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## Background

Claims-based studies of GLP-1 receptor agonists for obesity typically lack objective, longitudinal weight data, limiting real-world assessment of comparative effectiveness. Linking pharmacy claims to exact EHR-derived height and weight measurements enables population-scale evaluation of real-world BMI change by treatment, beyond what claims alone can support.

## Objective

To characterize real-world GLP-1 receptor agonist utilization patterns and quantify real-world BMI change among adults with obesity using exact height and weight measurements from NorstellaLinQ's linked claims and EHR database.

## Methods

| | |
|---|---|
| **Data Sources** | NorstellaLinQ linked claims and EHR data (covering more than 600 U.S. hospitals). Data sources analyzed include open claims, closed claims, and structured EHR. |
| **Study Design** | Retrospective descriptive cohort study · Adults initiating a GLP-1 RA, January 2024–March 2026 · No comparative adjustment performed |
| **Population** | N = 3,530,401 confirmed GLP-1 initiators · Identified via confirmed fills of obesity-indicated NDCs (tirzepatide, semaglutide injectable, semaglutide oral) · Diabetes-indicated formulations of the same molecules excluded · Index date = first confirmed fill |
| **BMI Assessment** | Paired subcohort (n = 137,250): valid EHR weight within 12 months pre-index and 6–9 months post-index · BMI outcomes assessed by drug group |
| **Outcomes** | Baseline characteristics and comorbidities by drug group · Mean % BMI reduction and ≥5%/≥10% response rates at 6 months · Tirzepatide vs. semaglutide injectable gap with 95% CIs |

## Results

### Key Findings

*Real-world BMI reduction is greater with tirzepatide than semaglutide injectable, a gap supported by tightly estimated confidence intervals.*

**3.3%** — **Tirzepatide** mean BMI reduction at 6 months

**1.6%** — **Semaglutide Injectable** mean BMI reduction at 6 months

**8.9 pts** — **≥10% Response Gap** tirzepatide vs. semaglutide inj.

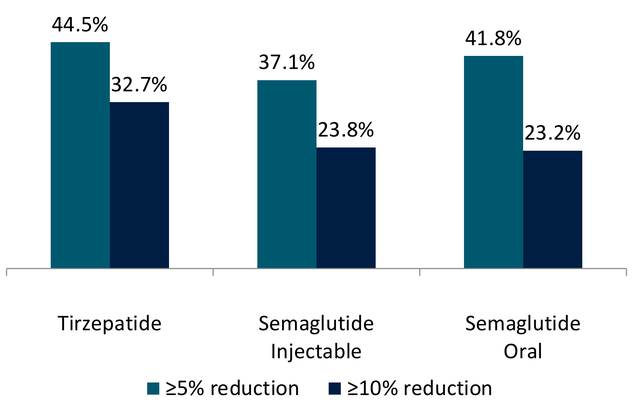
**137,250** — **Paired BMI Cohort** with pre- and post-index weight

**Table 1. Baseline Characteristics by Drug Group**

| Drug Group | N (%) | Age, mean (SD) | % Female | Race % (White/Black/Asian/Hispanic) | Comorbidities % (T2D/HTN/Dyslipidemia/OSA/NAFLD) |
|---|---|---|---|---|---|
| **Tirzepatide (Zepbound)** | 1,672,270 (47.4%) | 47 (13.3) | 72.0% | 52.3 / 7.6 / 2.2 / 9.2 | 6.0 / 24.8 / 26.1 / 16.1 / 4.6 |
| **Semaglutide Injectable (Wegovy)** | 1,766,097 (50.0%) | 47 (13.6) | 75.0% | 50.7 / 10.3 / 2.1 / 11.2 | 7.7 / 29.1 / 29.6 / 12.9 / 5.4 |
| **Semaglutide Oral (Wegovy Oral)** | 92,034 (2.6%) | 53 (14.4) | 72.2% | 54.1 / 6.7 / 1.8 / 5.2 | 5.7 / 24.0 / 23.7 / 8.6 / 3.4 |
| **Overall** | **3,530,401** | **47 (13.5)** | **73.5%** | **51.6 / 8.9 / 2.1 / 10.1** | **6.8 / 26.9 / 27.8 / 14.3 / 5.0** |

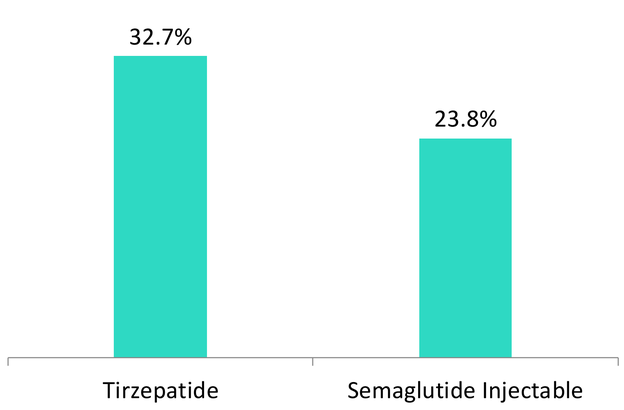
*Race categories omit Pacific Islander (<0.1%) and unknown/missing values; rows do not sum to 100%.*

**BMI Outcomes by Drug Group, 6 Months Post-Index**




*Mean % BMI reduction by drug: Tirzepatide 3.3%, Semaglutide Injectable 1.6%, Semaglutide Oral 3.5% (see Table 2).*

**Share of Patients With ≥10% BMI Reduction, by Product**




*95% CI: Tirzepatide 32.3–33.1% · Semaglutide Injectable 23.5–24.1%*

**Table 2. BMI Outcomes (Paired Pre/Post-Index Subcohort)**

| Drug Group | N | Baseline BMI | Mean % Reduction | ≥5% Reduction | ≥10% Reduction |
|---|---|---|---|---|---|
| **Tirzepatide** | 52,812 | 32.7 (9.3) | 3.3% | 44.5% | 32.7% |
| **Semaglutide Inj.** | 84,098 | 33.1 (8.8) | 1.6% | 37.1% | 23.8% |
| **Semaglutide Oral*** | 340 | 34.0 (5.2) | 3.5% | 41.8% | 23.2% |
| **Overall** | **137,250** | **33.0 (9.0)** | **2.3%** | **40.0%** | **27.2%** |

**Semaglutide oral 95% CIs are 5–9 points wide due to small N; presented descriptively, not in the formal comparison below.*

### Key Insight

Tirzepatide shows a precisely estimated, clinically meaningful advantage over semaglutide injectable: an 8.9-point higher ≥10% BMI reduction rate (95% CI 8.5–9.4) and a 1.7-point greater mean %BMI reduction (95% CI 1.4–2.0). Both intervals are narrow and exclude zero, indicating a precisely estimated effect given the large sample size.

### Conclusion

- Among 137,250 GLP-1 initiators with paired pre/post-index BMI, tirzepatide produced greater real-world weight loss than semaglutide injectable: a 1.7-point greater mean %BMI reduction (95% CI 1.4–2.0) and an 8.9-point higher rate of ≥10% BMI reduction (95% CI 8.5–9.4).
- Semaglutide injectable is now the largest treatment group (50.0% of initiators), overtaking tirzepatide (47.4%).
- Linking pharmacy claims to exact longitudinal EHR height and weight data enables real-world weight-loss assessment at a scale and precision not achievable from claims alone, supporting future comparative effectiveness and HTA research.

### Key Limitations

- Descriptive cohort study; no comparative adjustment for baseline differences between treatment groups (e.g., BMI, comorbidity burden, prior GLP-1 exposure).
- BMI outcomes reflect only the 3.9% of initiators (137,250 of 3,530,401) with a valid weight measurement both pre- and post-index; this subcohort may not be representative of all initiators.
- Reflects a refined initiator identification approach (confirmed fills only) and refined BMI ascertainment.
- Semaglutide oral results (n=340 paired) have wide confidence intervals and are presented descriptively; excluded from the formal tirzepatide vs. semaglutide injectable comparison.

GLP-1 RA, glucagon-like peptide-1 receptor agonist; NDC, National Drug Code; T2D, type 2 diabetes; HTN, hypertension; OSA, obstructive sleep apnea; NAFLD, non-alcoholic fatty liver disease; HTA, health technology assessment.

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