

Supplementary Methods: National population estimates and extrapolation

This document details the data sources, assumptions, and calculations used to estimate the national population of adults without diabetes in Poland eligible for glucagon-like peptide-1 receptor agonist (GLP-1 RA) therapy for weight management and to extrapolate the initiation rates observed in the Luxmed cohort to the national population.

1. Study Cohort Data (Luxmed, Poland)

Study period: January 1, 2018 – December 31, 2024

Cohort definition: New adult patients (≥ 18 years) with body mass index (BMI) ≥ 27 kg/m² without type 1 or type 2 diabetes mellitus

Total eligible cohort of patients without diabetes: 438,600 patients

Distribution by BMI category:

- BMI ≥ 30 kg/m²: 223,773 patients (51.0%)
- BMI 27-29.9 kg/m²: 214,827 patients (49.0%)
 - With ≥ 1 documented weight-related comorbidity*: 99,135 patients
 - Without documented comorbidities: 115,692 patients

*Weight-related comorbidities: arterial hypertension, coronary artery disease, hypercholesterolemia, sleep apnea

Observed cumulative GLP-1 RA initiation rates:

- Overall cohort: 4.7% (20,671/438,600)

- BMI ≥ 30 kg/m²: 7.7% (17,221/223,773)
- BMI 27-29.9 kg/m² with ≥ 1 comorbidity: 1.8% (1,827/99,135)
- BMI 27-29.9 kg/m² without documented comorbidities: 1.4% (1,623/115,692)

2. Polish national population and BMI prevalence data

Total adult population source: Główny Urząd Statystyczny (GUS, Statistics Poland), 2024 estimate

- Total adults (≥ 18 years): ~31 million

BMI prevalence sources: Polish epidemiological studies (WOBASZ, PolSenior, NATPOL) and GUS (2020)

- Obesity (BMI ≥ 30 kg/m²): 20-22% of adults
- Overweight (BMI 27-29.9 kg/m²): 18-20% of adults

3. Estimation of national eligible population of patients without diabetes

We estimated the population of patients without diabetes within each BMI category eligible for GLP-1 RA therapy for weight management:

Adults without diabetes with BMI ≥ 30 kg/m²:

- Calculation: 20-22% \times 31 million = 6.2-6.82 million

Adults without diabetes with BMI 27-29.9 kg/m²:

- Calculation: 18-20% \times 31 million = 5.58-6.2 million

Adults without diabetes with BMI 27-29.9 kg/m² and ≥ 1 comorbidity (on-label eligible):

- Assumption: 40-50% have at least one relevant weight-related comorbidity
- Calculation: 40-50% × 5.58-6.2 million = 2.23-3.1 million

Total estimated national on-label eligible population of patients without diabetes:

- BMI ≥ 30 kg/m² + BMI 27-29.9 kg/m² with comorbidity
- ~6.2 million + ~2.5-3.1 million = **8.7-9.3 million individuals**

4. Extrapolation to national population

We applied Luxmed cohort initiation rates to national population estimates:

BMI ≥ 30 kg/m² (patients without diabetes):

- 7.7% × ~6.2 million = ~477,400 individuals

BMI 27-29.9 kg/m² with ≥ 1 comorbidity (patients without diabetes):

- 1.8% × ~3.1 million = ~57,000 individuals

Total estimated current national GLP-1 RA users for weight management in patients without diabetes:

- ~477,400 + ~57,000 = **~534,400 individuals**

5. Market penetration calculation

Estimated market penetration for on-label, weight management in patients without diabetes:

- ~534,400 / 8.7-9.3 million = **5.7-6.1%**

Limitations

Several important limitations affect these extrapolations:

- **Selection bias:** The Luxmed population may differ from the general Polish population in socioeconomic status, health literacy, health-seeking behaviors, and access to private healthcare. National uptake rates, particularly in public healthcare settings or rural areas, may be lower.
- **Comorbidity assumptions:** The estimation of individuals with BMI 27-29.9 kg/m² and comorbidities relies on an assumed proportion (40-50%), which may not reflect true national prevalence.
- **Documentation completeness:** Comorbidity documentation in the Luxmed dataset may be incomplete, potentially underestimating the eligible population.
- **Temporal factors:** GLP-1 RA availability, awareness, and pricing fluctuate over time, influencing uptake patterns.
- **Diabetes exclusion:** While we focused on individuals without diabetes, precise national co-prevalence data for BMI categories stratified by diabetes status are limited, introducing uncertainty into our estimates.

Supplementary Table SI. Baseline demographics and clinical characteristics of the study population

Variable	N = 438,600
BMI \geq 30 kg/m ²	223,773 (51.0%)
BMI 27-29.9 kg/m ²	214,827 (49.0%)
Age, years	44.0 (25.0-55.0)
Age \geq 65 years	55,197 (12.6%)
Male gender	233,091 (53.1%)
Arterial hypertension	157,449 (35.9%)
Coronary artery disease	15,237 (3.5%)
Hypercholesterolemia	149,224 (34.0%)
Sleep apnea	11,872 (2.7%)
GLP-1 RA initiation	20,671 (4.7%)

Data presented as n (%) or median (interquartile range)

Abbreviations: BMI, body mass index; GLP-1 RA, glucagon-like peptide-1 receptor agonist

Supplementary Figure S1. Treatment cascade for GLP-1 receptor agonist therapy in Polish adults without diabetes. Cascade from total adult population to current GLP-1 RA users for weight management, based on Luxmed cohort data (2018-2024) extrapolated to national estimates. The treatment gap indicates that 94% of eligible adults without diabetes remain untreated.

