Identifying Obesity in Administrative Health Data: Trends and Overlap of Diagnosis Codes, Bariatric Procedures, and Anti-Obesity Medications in Alberta, Canada

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1. Background

Obesity is a major public health concern associated with increased risks of chronic disease, premature mortality, and healthcare costs.[1,2]

Population-level real-world evidence is increasingly important for understanding obesity and its management, particularly with the expanding availability of anti-obesity medications (AOMs).

However, body mass index (BMI) is not routinely captured in Canadian administrative health data, limiting the ability to identify individuals with obesity.[3]

Obesity diagnosis codes may be underutilized, while bariatric procedure codes and AOM dispensation records may provide complementary indicators for identifying individuals with obesity.[3]

2. Objectives

The objectives of this study were to:

- **Primary:** Describe annual trends in the identification of adults with obesity/overweight indicators in Alberta administrative health data using diagnosis codes, bariatric procedure codes, and AOM dispensations, including the overlap between indicators for each fiscal year from 2015/16 to 2023/24.
- **Secondary:** Examine the therapeutic management of adults identified with an obesity diagnosis code, including the use of bariatric procedures and AOMs.

3. Methods

Data Sources

Linked administrative health data from Alberta Canada were used, including the Alberta Population Registry, Practitioner Claims (physician billings), Discharge Abstract Database (inpatient hospitalizations), National Ambulatory Care Reporting System (outpatient services), Pharmaceutical Information Network, Vital Statistics, and the Alberta Health Chronic Disease Surveillance Registries (diabetes and hypertension).

Study Design

A population-based, observational study was conducted using linked administrative health data from Alberta, Canada, covering April 1, 2014 to March 31, 2024. Two complementary study designs were used to address the study objectives (Figure 1 and Table 1).

Figure 1: Study Design by Objective

Objective 1: Repeated Cross-Sectional Study

Study Period

April 1, 2015 – March 31, 2024 (annual analyses)

Study Population

Inclusion: Adults ≥18 years on April 1 each fiscal year with ≥1 obesity/overweight indicator and residents of Alberta for ≥6 months of the fiscal year

ODC | BPC | AOM

Exclusion: Individuals receiving semaglutide or tirzepatide with a diabetes diagnosis

Study Outcomes

Annual frequencies and overlap between indicators

Objective 2: Retrospective Cohort Study

Study Period

Cohort Entry
First obesity diagnosis code between April 1, 2015 – March 31, 2024

Study Population

Inclusion: Adults ≥18 years with an obesity diagnosis code and residents of Alberta for ≥12 months prior to index

Exclusion:

- Prior bariatric procedure or AOM dispensation in the 12 months prior to index
- Individuals receiving semaglutide or tirzepatide with a diabetes diagnosis were excluded.

Study Outcomes

Treatment patterns with bariatric procedures and AOMs

Table 1: Obesity/Overweight Indicators

Description	Identification
Obesity Diagnosis Codes	ICD-9-CM: 278.0 ICD-10-CA: E66
Bariatric Procedure Codes	CCI: 1.NF.78 CCP: 56.93A, 56.93B, 56.93C, 56.93F
Anti-Obesity Medications	ATC code (drug name): A10BJ06 (semaglutide), A10BX16 (tirzepatide), A10BJ02 (liraglutide), A08AB01 (orlistat), A08AA62 (bupropion and naltrexone).

Abbreviations: ATC: Anatomical Therapeutic Chemical; CCI: Canadian Classification of Health Interventions; CCP: Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures; ICD -9CM: The International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CA: International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada

4. Results

Primary Objective Results

552,374 Individuals with ≥1 obesity/overweight indicator

49.2 years Mean age of at first encounter

60.3% Female

Figure 2: Annual Number of Individuals Identified using Each Indicator, 2015/16 to 2023/24

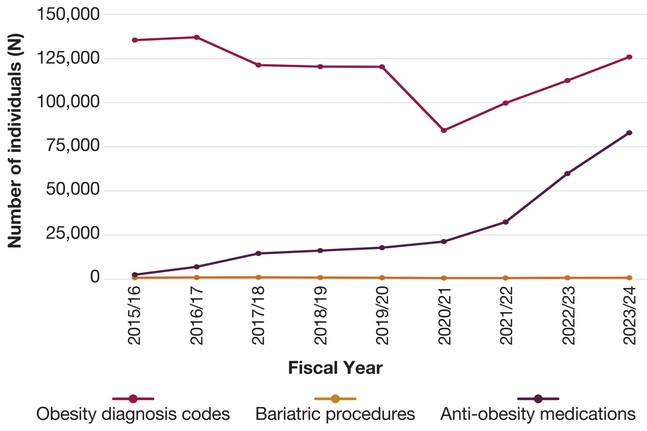
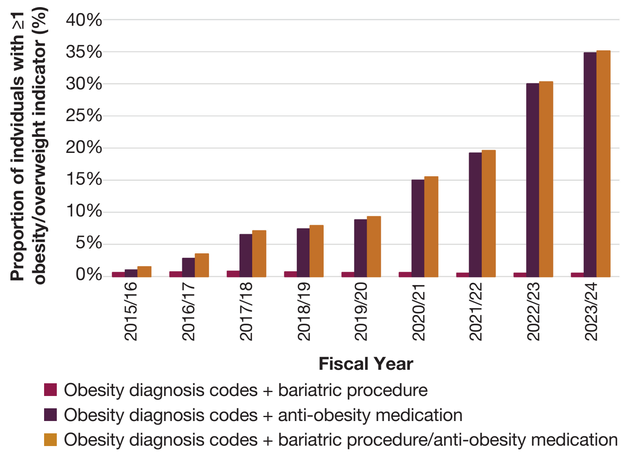


Figure 3: Annual Overlap Between Obesity Indicators, 2015/16 to 2023/24



Secondary Objective Results

Figure 4: Secondary Objective Study Population

Adults with an obesity diagnosis code
April 1, 2015 to March 31, 2024

N = 449,156

Exclusions (non-mutually exclusive)
- Non-Albertan residents: N = 15,408
- Age <18 years: N = 4,227
- Bariatric procedure in the year before index: N = 26
- AOM dispensation in the year before index: N = 15,228

Final Objective 2 Cohort

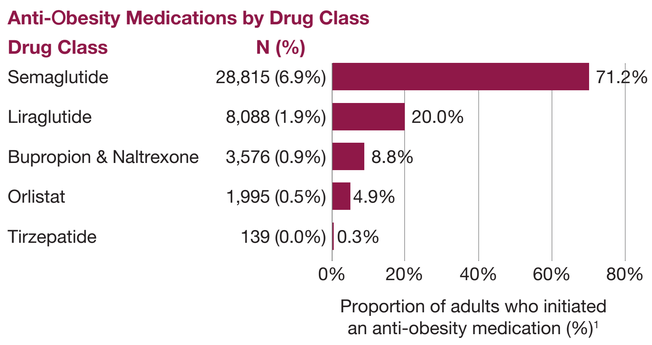
N = 416,102

Abbreviations: AOM: anti-obesity medication

Figure 5: Anti-Obesity Medications or Procedures within 1 Year Following Index

40,485 (9.7%) Adults initiated an anti-obesity medication within 1 year

357 (0.1%) Adults underwent a bariatric procedure within 1 year



1 Percentages are for drug classes among patients who initiated an anti-obesity medication (N = 40,485). A small number of patients may appear in more than one drug class if they initiated multiple anti-obesity medications within 1 year.

Table 2: Baseline Characteristics of the Study Cohort

Characteristic	Cohort (N = 416,102)
Age (years), mean (SD)	48.7 (15.4)
Female, n (%)	246,179 (59.2%)
Comorbidities	
Diabetes	71,770 (17.2%)
Hypertension	168,653 (40.5%)
Dyslipidemia	55,176 (13.3%)
Patient Residence (AHS Zones)	
Calgary	158,818 (38.2%)
Edmonton	140,232 (33.7%)
North, Central, South	117,042 (28.1%)
Missing	10 (0.0%)

Abbreviations: AHS: Alberta Health Services

5. Conclusions

- Alberta administrative health data provide complementary indicators for identifying individuals with obesity, although the populations captured by diagnosis codes, bariatric procedures, and AOM dispensations differ.
- The increasing use of AOMs, particularly in recent years, highlights the importance of incorporating medication data when examining obesity/overweight trends in administrative databases.
- Among adults identified with an obesity diagnosis code, fewer than 10% received an AOM or underwent a bariatric procedure within one year, suggesting limited use of these treatments in the diagnosis-defined cohort.

References

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Research ethics board approval and use of artificial intelligence
This study was approved by the Health Research Ethics Board of Alberta (HREBA.CHC-24-0045) on July 3, 2024. Artificial intelligence was used to assist with with drafting and editing poster content. All content and figures were reviewed and verified by the authors.

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None.

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