

## Healthcare Utilization and Costs of Specific Obesity Related Health Conditions in Alberta, Canada

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**Abstract :** Obesity-related health conditions impose a substantial economic burden on payers due to increased healthcare use. Estimates of healthcare resource use and costs associated with obesity-related comorbidities are needed to inform policies and interventions targeting these conditions. Methods: Adults living with obesity were identified (a procedure-related body mass index code for class 2/3 obesity between 2012 and 2019 in Alberta, Canada; excluding those with bariatric surgery), and outcomes were compared over 1-year (2019/2020) between those who had and did not have specific obesity-related comorbidities. The probability of using a healthcare service (based on the odds ratio of a zero [OR-zero] cost) was compared; 95% confidence intervals (CI) were reported. Logistic regression and a generalized linear model with log link and gamma distribution were used for total healthcare cost comparisons (\$CDN); cost ratios and estimated cost differences (95% CI) were reported. Potential socio-demographic and clinical confounders were adjusted for, and incremental cost differences were representative of a referent case. Results: A total of 220,190 adults living with obesity were included; 44% had hypertension, 25% had osteoarthritis, 24% had type-2 diabetes, 17% had cardiovascular disease, 12% had insulin resistance, 9% had chronic back pain, and 4% of females had polycystic ovarian syndrome (PCOS). The probability of hospitalization, ED visit, and ambulatory care was higher in those with a following obesity-related comorbidity versus those without: chronic back pain (hospitalization: 1.8-times [OR-zero: 0.57 [0.55/0.59]] / ED visit: 1.9-times [OR-zero: 0.54 [0.53/0.56]] / ambulatory care visit: 2.4-times [OR-zero: 0.41 [0.40/0.43]]), cardiovascular disease (2.7-times [OR-zero: 0.37 [0.36/0.38]] / 1.9-times [OR-zero: 0.52 [0.51/0.53]] / 2.8-times [OR-zero: 0.36 [0.35/0.36]]), osteoarthritis (2.0-times [OR-zero: 0.51 [0.50/0.53]] / 1.4-times [OR-zero: 0.74 [0.73/0.76]] / 2.5-times [OR-zero: 0.40 [0.40/0.41]]), type-2 diabetes (1.9-times [OR-zero: 0.54 [0.52/0.55]] / 1.4-times [OR-zero: 0.72 [0.70/0.73]] / 2.1-times [OR-zero: 0.47 [0.46/0.47]]), hypertension (1.8-times [OR-zero: 0.56 [0.54/0.57]] / 1.3-times [OR-zero: 0.79 [0.77/0.80]] / 2.2-times [OR-zero: 0.46 [0.45/0.47]]), PCOS (not significant / 1.2-times [OR-zero: 0.83 [0.79/0.88]] / not significant), and insulin resistance (1.1-times [OR-zero: 0.88 [0.84/0.91]] / 1.1-times [OR-zero: 0.92 [0.89/0.94]] / 1.8-times [OR-zero: 0.56 [0.54/0.57]]). After fully adjusting for potential confounders, the total healthcare cost ratio was higher in those with a following obesity-related comorbidity versus those without: chronic back pain (1.54-times [1.51/1.56]), cardiovascular disease (1.45-times [1.43/1.47]), osteoarthritis (1.36-times [1.35/1.38]), type-2 diabetes (1.30-times [1.28/1.31]), hypertension (1.27-times [1.26/1.28]), PCOS (1.08-times [1.05/1.11]), and insulin resistance (1.03-times [1.01/1.04]). Conclusions: Adults with obesity who have specific disease-related health conditions have a higher probability of healthcare use and incur greater costs than those without specific comorbidities; incremental costs are larger when other obesity-related health conditions are not adjusted for. In a specific referent case, hypertension was costliest (44% had this condition with an additional annual cost of \$715 [\$678/\$753]). If these findings hold for the Canadian population, hypertension in persons with obesity represents an estimated additional annual healthcare cost of \$2.5 billion among adults living with obesity (based on an adult obesity rate of 26%). Results of this study can inform decision making on investment in interventions that are effective in treating obesity and its complications.

**Keywords :** administrative data, healthcare cost, obesity-related comorbidities, real world evidence

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