

RELATIONSHIP BETWEEN BMI AND HEALTHCARE COSTS IN A COMMERCIAL AND MEDICARE POPULATION

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INTRODUCTION

- Obesity has become a significant health concern due to its prevalence with more than two-thirds of the United States population being overweight or obese¹
- Over 40% of adults are obese¹ which is defined by the World Health Organization as excess adiposity that may impair health and is estimated using body mass index (BMI) which is weight in kilograms/height in meters²
- People with BMI values greater than or equal to 30 are considered obese
- The number of adults who are obese increased from 30.5% to 42.4% from 1999-2000 to 2017-2018¹ and is expected to be over 50% by 2030²
- People who are obese have a higher risk of cardiovascular disease, diabetes, cancer, and death³ and experience obesity-related co-morbidities (ORC) such as GERD, sleep apnea, hyperlipidemia, hypertension, psoriasis, and polycystic ovary syndrome⁴
- Given the co-morbidities associated with obesity, the direct medical costs of the disease in the United States are staggering at over \$260 billion in 2016⁵
- Indirect costs associated with obesity include disability, lower wages, and increased absenteeism⁶
- Early treatments for obesity consisted of diet and exercise programs, but most people using these methods gained back the lost weight during treatment
- Over the years, medical treatments for obesity were developed including bariatric surgery and anti-obesity medication (AOM)
- Early AOMs had modest benefits, and some were found to cause other health issues
- Prior research shows current AOMs⁷ and bariatric surgery⁸ are safe and effective as a treatment. However, obesity remains prevalent despite numerous treatment options
- This analysis examines the relationship between BMI and healthcare costs using a claims database containing data from multiple commercial payers
- While a few other studies looked at how costs vary by BMI, other research used a self-reported BMI measure or focused on data from one payer

OBJECTIVES

- This study aims to assess the relationship between body-mass index (BMI) and healthcare costs, examine the prevalence of ORCs, and understand how often anti-obesity drugs are denied

METHODS

- The study is a one-state, non-interventional, retrospective database analysis. The analysis was performed using pharmacy and medical reimbursement data from the New Hampshire all-payer claims database with 2020 dates of service
- The data set contains commercial and Medicare (supplement and advantage plans) claims from large payers within the state and includes payments made by insurance companies and members
- Patient eligibility for inclusion in the study was the following: 1) Age 18 and over. 2) An ICD-10 code is present for body mass index (BMI)
- The primary endpoint for the study is to determine the relationship between BMI and healthcare claims reimbursement. Costs include all payments made by insurance companies and members for medical and hospital services and physician fees on a visit where BMI was present. BMI was categorized into four cohorts (non-obese - BMI<30, Class 1 obesity -BMI 30-34.9, Class 2 obesity - BMI 35-39.9, Class 3 Obesity - BMI>=40)
- Secondary endpoints include the following: prevalence of obesity-related co-morbidities and denial rate of anti-obesity medications (AOM)
- The medical and pharmacy data were analyzed at a claim level so a person could appear multiple times in the data

RESULTS

- 60,415 claims included an ICD-10 code for BMI. The average medical claim cost (Table 1) was almost double when comparing non-obese (\$1,243) to obese (\$2,439) claims. As the class level of obesity increased so too did average medical claims costs (Class 1 - \$1,942, Class 2 - \$2,138, Class 3 - \$2,970)

Table 1. BMI Mean Cost

BMI	Mean Cost
Non Obese	\$ 1,243
Class 1	\$ 1,942
Class 2	\$ 2,138
Class 3	\$ 2,970

- The prevalence of claims with ORCs was higher in the obese cohort compared to the non-obese cohort (Table 2). Claims from obese patients were significantly more likely to have an ICD-10 code for GERD (10.1% vs 4.9%), hyperlipidemia (15.3% vs 9.6%), hypertension (29.5% vs 16.9%), and type II diabetes (9.8% vs 3.0%) when compared to claims from non-obese patients
- 4,588 pharmacy claims contained one of four AOMs being evaluated. The overall denial rate for these medications was 64.0% ranging from 58.9% to 70.3% in Table 3

Table 2 Analysis of ORCs

ORC	Non-Obese		Obese		P
	N	%	N	%	
GERD	676	4.9%	5,798	10.1%	<.001
Hyperlipidemia	1,341	9.6%	8,762	15.3%	<.001
Hypertension	2,355	16.9%	16,888	29.5%	<.001
Polysystic Ovary Syndrome	16	0.1%	677	1.2%	0.34
Prediabetes	137	1.0%	1,787	3.1%	0.08
Psoriasis	32	0.2%	157	0.3%	0.38
Sleep Apnea	73	0.5%	1,142	2.0%	0.18
Type II Diabetes	423	3.0%	5,591	9.8%	<.001

Table 3 Drug Denial Rate

Drug	Denials	Denial Rate
Liraglutide	1,366	58.9%
Naltrexone-bupropion	1,075	70.3%
Orlistat	29	61.7%
Phentermine/topiramate	468	67.7%

CONCLUSIONS

- Obesity is associated with higher reimbursement and as the class level of obesity increases so do average medical claims costs
- Obesity has reached epidemic levels and will soon overwhelm the healthcare system due to ORCs. The prevalence of ORCs highlights the need to prevent and treat obesity rather than the resulting health issues
- Health insurance payers frequently deny AOMs despite the higher cost of healthcare for obese individuals. Benefit plans should increase coverage of AOMs for individuals who are indicated as overall costs are likely to be higher than reported here since indirect costs were not evaluated

REFERENCES

- Fryar CD, Carroll MD, Aful J. Prevalence of overweight, obesity, and severe obesity among adults aged 20 and over: United States, 1960–1962 through 2017–2018. NCHS Health E-Stats, Centers for Disease Control and Prevention. 2020. Updated February 8, 2021. Accessed January 29, 2021. www.cdc.gov/nchs/data/hestat/obesity-adult-17-18/obesity-adult.htm External link.
- Finkelstein EA, Khavjou OA, Thompson H, Trogon JG, Pan L, Sherry B, Dietz W. Obesity and severe obesity forecasts through 2030. Am J Prev Med. 2012 Jun;42(6):563-70.
- Centers for Disease Control and Prevention. About Overweight & Obesity. <https://www.cdc.gov/obesity/about-obesity/index.html>. Published 2021. Accessed April 21, 2022.
- Divino V, Ramasamy A, Anupindi VR, Eriksen KT, Olsen AH, DeKoven M, Meincke HH. Complication-specific direct medical costs by body mass index for 13 obesity-related complications: a retrospective database study. J Manag Care Spec Pharm. 2021 Feb;27(2):210-222.
- Cawley J, Biener A, Meyerhoefer C, et al. Direct medical costs of obesity in the United States and the most populous states. J Manag Care Spec Pharm. 2021;27(3):354-366.
- Dor A, Ferguson C, Langwith C, Tan E. A Heavy Burden: The Individual Costs of Being Overweight and Obese in the United States. The George Washington University, School of Public Health and Health Services; September 21, 2010.
- Bersoux S, Byun TH, Chaliki SS, Poole KG. Pharmacotherapy for obesity: What you need to know. Cleve Clin J Med. 2017 Dec;84(12):951-958.
- O'Brien PE, Hindle A, Brennan L, Skinner S, Burton P, Smith A, Crosthwaite G, Brown W. Long-Term Outcomes After Bariatric Surgery: a Systematic Review and Meta-analysis of Weight Loss at 10 or More Years for All Bariatric Procedures and a Single-Centre Review of 20-Year Outcomes After Adjustable Gastric Banding. Obes Surg. 2019 Jan;29(1):3-14.

DISCLOSURES

The authors report no conflicts. No funding was provided for data acquisition or analysis.

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