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Cost of Illness: Estimating Direct Health Care Costs Related to Obesity in a Japanese Clinical Setting

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Objective

- Obesity or being overweight is associated with diabetes, CV complications, cancer, and knee replacement surgery. **The current study aims to estimate the direct health care costs of obesity-related complications in a Japanese clinical setting** using an insurer-based administrative claims database.

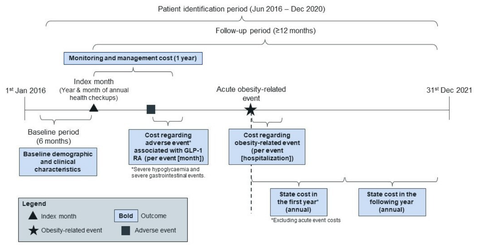
Background/Rationale

- **Obesity is associated with an increased risk of developing diabetes, CV** related complications, and several other diseases**. It significantly impairs the quality of life** and inflicts a major economic burden on patients, given the costs of treating the diseases associated with it.
- The rapidly **increasing incidence of overweight and obesity in Asia and the Pacific is alarming.** The **obesity rates increased at an average of 31.5% in East Asian countries between 1990 and 2013,** and obesity plays an important role in various diseases even at **relatively lower BMI levels.** [1]
- **Japan appears to incur the highest direct cost** due to obesity despite the relatively low prevalence **rate of 23.3% among East Asian countries in 2013.**
- A **BMI of >25 kg/m²** is considered obese according to the Japanese Society for the Study of Obesity and the Korean Society for the Study of Obesity, while the WHO defines obesity as a BMI of 30 kg/m² or more.
- The **estimation of health care costs of obesity-related treatments** is important for developing models **based on new risk equations** or transition probabilities that can predict the development of **obesity-associated diseases**.
- A large-scale insurer-based administrative database. the **IQVIA Claims database, which is based on health insurance data from 69 payers with 5.44 million subscribers** (December 2021), will help to obtain health care costs by entire patient journeys across different clinics, hospitals, and pharmacies for the management of obesity, as recommended by a Japanese HTA agency.
- The **IQVIA Claims database will help to obtain local health care costs** associated with the monitoring and management, treatment of adverse events, acute obesity-related events, and health states defined by the various complications, in **accordance with the C2H guidelines for cost-effectiveness analysis.**[2]

Methods

- A **retrospective cohort study was conducted** utilizing data **extracted from the IQVIA Claims database** to obtain direct health care costs for entire patient journeys across different healthcare institutions.
- The costs were **estimated by accumulating medical fees** associated with deliveries of relevant services, while acute obesity-related events were estimated using a generalized gamma regression model.
- Patients **aged ≥18 years** at the index month with **BMI ≥27.0 kg/m²** and at least **2 weight-related comorbidities**, or **BMI ≥35.0 kg/m²** and at least **1 weight-related comorbidity** (hypertension, dyslipidaemia, or T2D), for at least 6 months before or on the month of annual health check-ups were **identified from June 2016 to December 2020 (Figure 1).** The **total study period** was from January 2016 to December 2021.
- The cost was **inflated to reflect the April 2022 Japanese medical fee schedule and converted to US dollars.**
- The study outcomes were **estimated costs of obesity related acute events and bariatric surgery**. Cost items were collected based on the Japanese public payer's perspective.

Figure 1: Study design



Results

Table 1: Baseline Characteristics

Baseline characteristics		Study cohort: N = 28,261
Year of enrollment (n, %)	**2016 – 2018**	**23,593 (83.48%)**
	2019 – 2020	4,668 (16.52%)
Sex (n, %)	**Male**	**21,213 (75.06%)**
Age group (n, %)	18 – 44 years	5,731 (20.28%)
	45 – 64 years	**20,945 (74.11%)**
	≥65 years	1,585 (5.61%)
Mean BMI (SD)		**30.82 kg/m² (66.47)**
Mean HbA1c (NGSP) at baseline period (SD)		**6.31 (1.15) (n=25,776)**

Table 2: Comorbidities at Baseline

Baseline characteristics		Study cohort: N = 27,550
Comorbidity at baseline period (n, %)	**Hypertension**	22,101 (**78.20%**)
	T2D without microvascular complication	12,065 (**42.69%**)
	NAFLD	5,322 (**18.83%**)
	T2D with microvascular complication	2,949 (**10.43%**)

Figure 2: Representing Obesity related Acute Events Costs

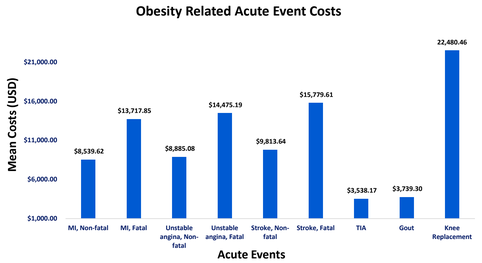
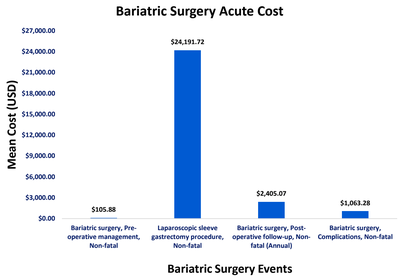


Figure 3: Representing Bariatric Surgery Acute Costs



Summary

- Health care costs were estimated in patients with obesity using the IQVIA Claims database.
- The total **study cohort comprised of 28,261 patients**, of which **83.48% (N = 23,593)** were enrolled by the year 2018. The majority **(75.06%)** were **male** and aged between **45 and 64 years (74.11%),** with a **mean BMI of 30.8 kg/m², 88.84%** of patients were in ≥27 kg/m² and <35 kg/m². The mean **HbA_{1c}** value was **6.31% (Table 1).** At baseline, the **most prevalent condition was hypertension (78.20%),** followed by **T2D without microvascular complications (42.69%),** non-alcoholic steatohepatitis **(18.83%),** and T2D with microvascular complications **(10.43%) (Table 2).**
- Of all the **acute obesity-related events, knee replacement was the most expensive procedure ($22,480),** followed by fatal stroke **($15,779),** fatal unstable angina **($14,475),** and fatal MI **($13,717),** while no patient had gout or liver transplant during the follow-up period **(Figure 2).**
- **Bariatric surgery** is the most effective treatment for obesity and the most commonly performed bariatric procedure is **laparoscopic sleeve gastrectomy** which is an expensive procedure (**$24,191**). The total cost incurred for bariatric surgery was **$27,765 (Figure 3).**

Strengths

- A large-scale insurer-based database such as the IQVIA Claims database is **advantageous to monitor the entire patient journey** in case the patient receives medical care from different medical providers for a chronic disease with multiple and complex comorbidities.
- The **target population** (ie, obesity with single/multiple obesity-related conditions) is suitable to understand the **entirety of medical resources used** across the different medical facilities.
- **Costs associated with obesity-related acute events** and various health states were estimated as conditional means after controlling all other comorbidities and demographic characteristics, **based on a multivariable generalized gamma regression with log link.**
- The model is considered **suitable to analyse skewed data, such as health care costs.**

Limitations

- The **cost estimates were likely to be affected by the age distribution**, as the majority of patients included in the IQVIA Claims database were company employees younger than 65 years.
- **A lack of generalisability to other age groups** exists. Also, the estimation of the surgical cost was based on a few sample size (N=8).

Future Perspectives

- The **health care costs estimated in this study will help to assess the economic burden of obesity in Japanese clinical settings**, leading to **real-world cost evidence in future value-based economic** evaluations of an effective intervention for obesity.
- Further investigation is required to learn healthcare resource required per treatment for obesity. In the future, we would like to compare the amount of healthcare resource required for the surgery against the non-surgical treatments.

BMI: Body Mass Index; CV: Cardiovascular; C2H: Guideline for Cost-effectiveness Evaluation; HbA_{1c}: Glycated Haemoglobin; HTA: Health Technology Assessment; MI: Myocardial Infarction; NAFLD: non-alcoholic fatty liver disease; NGSP: National Glycohemoglobin Standardization Program; TIA: transient ischemic attack; T2D: Type 2 diabetes; USD: US Dollars; WHO: World Health Organisation.

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References:

1. Helble, M. and A. Sato, Wealthy but unhealthy overweight and obesity in Asia and the Pacific: trends, costs, and policies for better health. 2018: Asian Development Bank Institute.
2. Center for Outcomes Research and Economic Evaluation for Health, National Institute of Public Health (C2H Japan) [in Japanese]. Guideline for Preparing Cost-Effectiveness Evaluation to the Central Social Insurance Medical Council. Version 3.0. 2022 [updated 01-Jan-2021]. Available from: https://c2h.niph.go.jp/tools/guideline/index.html.