



Online Supplementary Material

Cost-Effectiveness of Semaglutide 2.4 mg for Obesity Disease Management in Japan: A Lifetime Economic Modeling Study Incorporating Retreatment Scenarios. *JHEOR*. 2026;13(1):288-296. [doi:10.36469/jheor.2026.162614](https://doi.org/10.36469/jheor.2026.162614)

Table S1: Parameters – Utility, Costs, Health Care Resource Use and Disease-Specific Mortality

Figure S1: Tornado Diagrams (One-Way Sensitivity Analysis)

Figure S2. Cost-Effectiveness Acceptability Curve for Semaglutide 2.4 mg vs Diet and Exercise

This supplementary material has been provided by the authors to give readers additional information about their work.



Table S1. Parameters–Utility, Costs, Health Care Resource Use and Disease-Specific Mortality

| Variable | Value | Description and Reference |
|---|----------------------------|--|
| Baseline utility | 0.874 | Luah et al, 2024 ¹ |
| Health state disutilities | | |
| T2D | -0.046 | Shiroiwa et al 2021 ² |
| Post-ACS | -0.04 | Kodera et al 2018 ³ |
| OSA | -0.047 | Kawakami et al 2020 ⁴ |
| Cancer, decompensated liver cirrhosis | -0.084 | Shiroiwa et al 2021 ² |
| Post stroke | -0.24 | Kodera et al 2018 ³ |
| Pre-diabetes | 0 | Assumption |
| Gout | -0.012 | Shiroiwa et al 2021 ² |
| Event disutility | | |
| Bariatric surgery | -0.2 | Campbell et al 2010 ⁵ , Shiroiwa et al 2021 ² |
| ACS | -0.073 | Shiroiwa et al 2021 ² |
| Musculoskeletal | -0.023 | Sullivan et al, 2011 ⁶ |
| Stroke | -0.265 | Shiroiwa et al 2021 ² |
| TIA | -0.033 | Sullivan et al 2011 ⁶ |
| Liver transplant | -0.07 | Lim et al 2015 ⁷ |
| Adverse event disutility | | |
| Disutility severe gastrointestinal events | -0.001 | NICE STA [TA494] ⁸ |
| Disutility non-severe hypoglycemia | -0.006 | Foos et al 2018 ⁹ |
| Disutility severe hypoglycemia | -0.015 | Same as above |
| Obesity treatment costs (95% CI) | | |
| Semaglutide 2.4 mg | ¥10,096 | Cost per day × 7= cost per weekly injection |
| Semaglutide 1.7 mg | ¥7,429 | Same as above |
| Semaglutide 1.0 mg | ¥5,557 | Same as above |
| Semaglutide 0.5 mg | ¥3,009 | Same as above |
| Semaglutide 0.25 mg | ¥1,764 | Same as above |
| Monitoring costs for obesity, annual | ¥24,908 (24,671-25,145) | IQVIA claims database |
| Diet & exercise (if in addition to | ¥2,724 | Same as above |

| Variable | Value | Description and Reference |
|---|---------------------------------|--|
| obesity monitoring costs above) | (2,697-2,752) | |
| Blood pressure treatment (most used ACEi) | ¥25,533 (15,960-34,467) | Same as above |
| T2D weighted average of insulin and oral treatments | ¥58,034 (47,442-65,645) | Same as above |
| Costs adverse events (per event) (95% CI) | | |
| Non-severe hypoglycemia | ¥0 | Glucose intake (self-treated), reimbursed ¥0 |
| Severe hypoglycemia | ¥22,189 (16,642-27,736) | IQVIA claims database |
| Severe gastrointestinal events | ¥8,167 (275-16,058) | Same as above |
| STATE COSTS (annual)-exclude acute care costs related to events | | |
| T2D microvascular complications costs (excl. treatment costs above) | ¥183,427 (159,941-199,449) | Same as above |
| Prediabetes | ¥5,663 (0-25,750) | Same as above |
| Post T2D (cured) | ¥0 | Same as above |
| Cancer treatment colon in first year | ¥822,111 (609,320-1,017,877) | Same as above |
| Cancer treatment breast in first year | ¥951,561 (686,552-1,209,276) | Same as above |
| Cancer treatment endometrial in first year | ¥961,007 (394,944-1,582,851) | Same as above |
| Cancer treatment (average of colon, breast, endo) in follow-up year | ¥158,666 (93,129-220,804) | Same as above |
| MI first year, excl. acute event cost | ¥172,792 (45,207-330,191) | Same as above |
| Unstable angina first year, excl. acute event cost | ¥306,849 (152,341-482,855) | Same as above |
| Post acute coronary syndrome (MI or Unstable angina, in year following the event) | ¥224,620 (134,614-321,270) | Same as above |

| Variable | Value | Description and Reference |
|---|-------------------------------------|---|
| Stroke first year, excl. acute event cost | ¥939,026 (652,612-1,200,263) | Same as above |
| TIA, first year, excl. acute event cost | ¥0 | Assumed to be zero due to negative incremental cost |
| Post-stroke (stroke and TIA, in year following the event) | ¥79,481 (35,444-122,711) | IQVIA claims database |
| Sleep apnea cost (eg, annual management with continuous positive airway pressure) | ¥125,282 (104,036-142,557) | Same as above |
| Decompensated liver cirrhosis in first year | ¥91,524 (22,356-183,508) | Same as above |
| Hepatocellular carcinoma in first year | ¥115,211 (25,861-221,715) | Same as above |
| NAFLD in follow-up year | ¥0 | Assumed to be zero due to negative incremental cost |
| Gout, follow-up year | ¥209,404 (19,024-526,154) | IQVIA claims database |
| Decompensated liver cirrhosis in follow-up year | ¥59,393 (1,906-136,930) | Same as above |
| HCC in follow-up year | ¥226,347 (34,233-456,631) | Same as above |
| Acute care costs (per event) (95% CI) | | |
| MI nonfatal event | ¥1,148,094 (993,830-1,266,707) | IQVIA claims database |
| MI fatal event | ¥1,844,271 (95,128-4,725,732) | Same as above |
| Unstable angina nonfatal event | ¥1,194,538 (627,583-1,914,847) | Same as above |
| Unstable angina fatal event | ¥1,946,090 (84,839-5,920,989) | Same as above |
| Stroke nonfatal event | ¥1,319,377 (1,073,294-1,561,398) | Same as above |
| Stroke fatal event | ¥2,121,460 | Same as above |

| Variable | Value | Description and Reference |
|--|---------------------------------------|---|
| | (119,598-5,710,902) | |
| TIA event | ¥475,682 (229,907-813,022) | Same as above |
| Bariatric surgery, preoperative management | ¥14,235 (5,399-23,071) | IQVIA claims database |
| Gastric bypass procedure | ¥3,252,411 (2,386,332-8,232,935) | Calculated based on sleeve gastrectomy, which is the most commonly performed bariatric surgery for severe obesity in Japan |
| Laparoscopic banding procedure | ¥3,252,411 (2,386,332-8,232,935) | Same as above |
| Sleeve gastrectomy procedure | ¥3,252,411 (2,439,309-8,303,570) | IQVIA claims database |
| Bariatric surgery, post-operative follow-up | ¥323,345 (102,235-544,454) | Same as above |
| Bariatric surgery, complications (leaks) | ¥142,951 (84,817-201,084) | Same as above |
| Bariatric surgery, TOTAL nonfatal | ¥3,592,335 (2,542,597-8,866,744) | Calculated as the weighted average of the costs of gastric bypass, laparoscopic banding, and sleeve gastrectomy procedures. |
| Bariatric surgery, TOTAL fatal | ¥3,592,335 (2,542,597-8,866,744) | Assumed to be the same as bariatric surgery, nonfatal |
| Knee replacement, nonfatal | ¥2,593,940 (1,667,041-4,578,678) | IQVIA claims database |
| Knee replacement, fatal | ¥2,593,940 (1,667,041-4,578,678) | Assumed to be the same cost for nonfatal and fatal |
| Liver transplant | ¥15,086,969 (7,489,353-22,468,058) | Kawaguchi et al 2020 ¹⁰ |
| Disease specific probabilities of death | | |
| Case fatality MI (% per event) | 38.80 | Rumana et al 2014 ¹¹ |
| Case fatality angina (% per event) | 38.80 | Rumana et al 2014 ¹¹ |

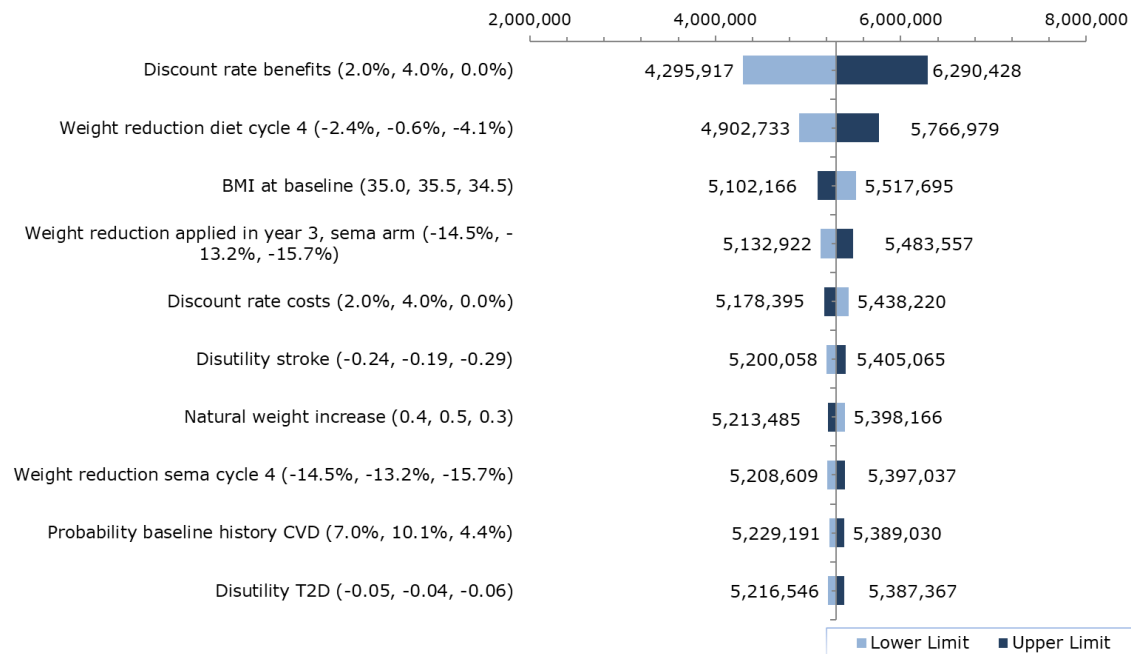
| Variable | Value | Description and Reference |
|---|--------------|---|
| Case fatality stroke (% per event) | 13.60 | Takashima et al 2020 ¹² |
| Post-ACS (HR applied to general mortality) | 1.3 | Johansson et al, 2017 ¹³ (The relative risk for all-cause death and cardiovascular outcomes (recurrent MI, cardiovascular death) was at least 30% higher than that in a general reference population at both 1-3 years and 3-5 years after MI) |
| Post-stroke (HR applied to general mortality) | 2 | Brammås et al, 2013 ¹⁴ (The 1-year mortality was 36.5% for AMI complicated by ischemic stroke and 18.3% for AMI without stroke, hence 2X higher) |
| Case fatality knee replacement (%) | 0.36 | Sinclair et al 2021 ¹⁵ |
| Colorectal cancer (% in year of onset) | 33.74 | Cancer Registry Data 2019 ¹⁶ ; calculated by dividing the 2019 crude mortality rate for colorectal cancer by the crude incidence rate. |
| Breast cancer (% in year of onset) | 15.60 | Same as above; calculated by dividing the 2019 crude mortality rate for breast cancer by the crude incidence rate among females. |
| Endometrial cancer (% in year of onset) | 14.86 | Same as above; calculated by dividing the 2019 crude mortality rate for endometrial cancer by the crude incidence rate. |

| Variable | Value | Description and Reference |
|--|--------------|--|
| Decompensated liver cirrhosis (%) | 43.30 | Fujiyama et al, 2021 ¹⁷ ; complement of the 5-year cumulative survival rate in patients with decompensated liver cirrhosis. |
| HCC (%) | 69.30 | Same as above |
| Case fatality for liver transplant (%) | 6.80 | Gong et al, 2020 ¹⁸ ; mortality rate during the initial hospitalization for liver transplantation. |
| Cancer (% in years 2+ from onset) | 7.60 | Cancer Registry Data 2019 ¹⁶ ; derived from the 5-year relative survival rate for localized stage cancer. |

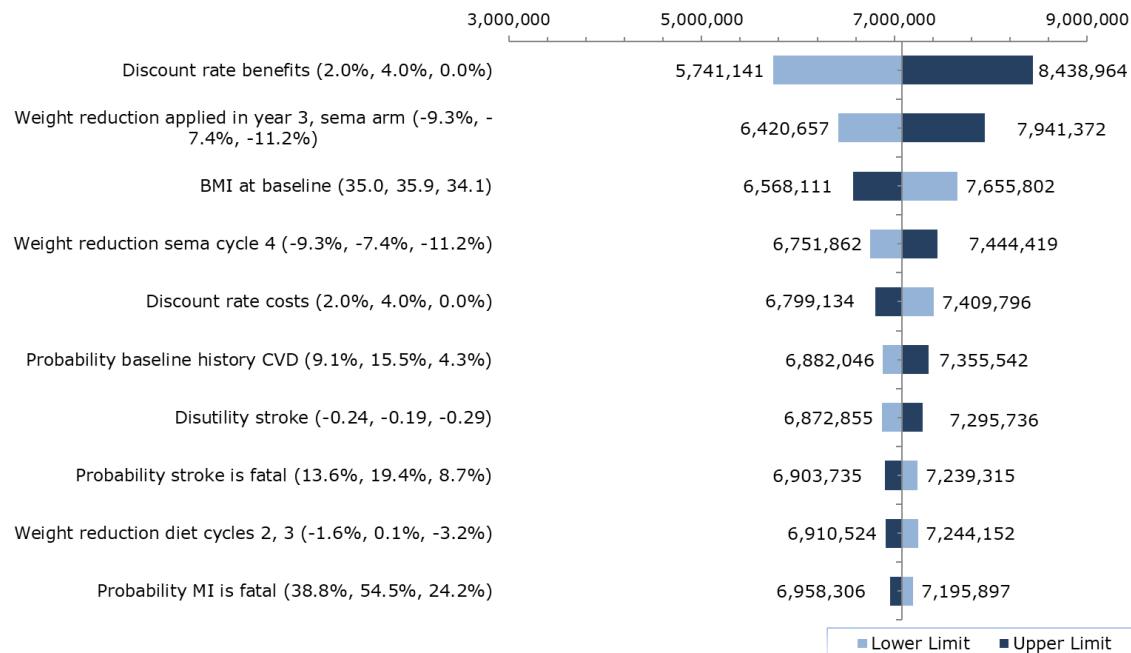
Abbreviations: ACS, acute coronary syndrome; HCC, hepatocellular carcinoma; HCRU, healthcare resource use; HR, hazard ratio; MI, myocardial infarction; NAFLD, nonalcoholic fatty liver disease; NASH, nonalcoholic steatohepatitis; OSA, obstructive sleep apnea, QOL, quality of life; T2D, type 2 diabetes; TIA, transient ischemic attack.

Figure S1. Tornado Diagrams (One-Way Sensitivity Analysis)

Subgroup: non-T2D at baseline



Subgroup: T2D at baseline

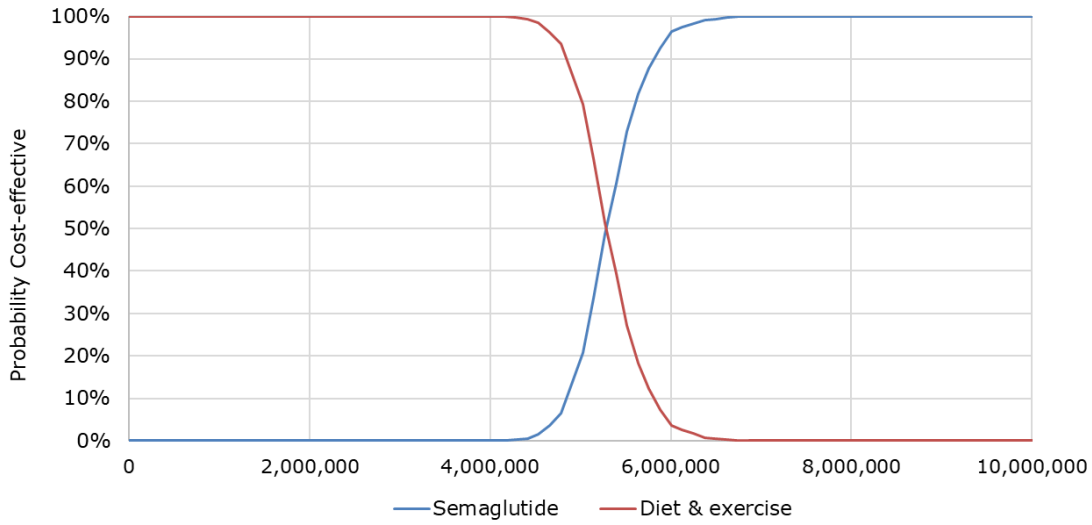


Abbreviations: BMI, body mass index; CVD, cardiovascular disease; MI, myocardial infarction; T2D, type 2 diabetes.

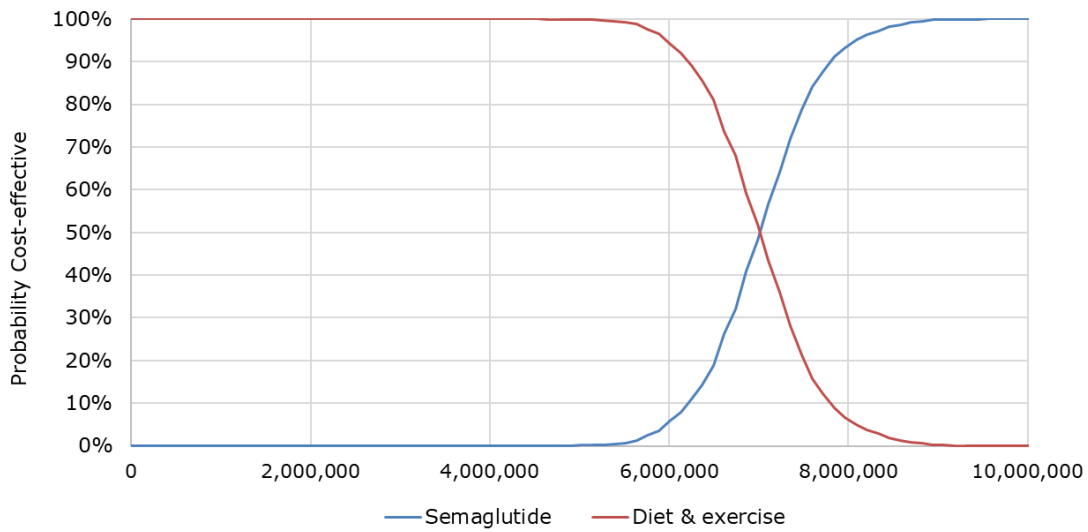
Note: Horizontal bar chart. Center axis is Base Case ICER. Values in each parameter means base case, upper value, and lower value from left.

Figure S2. Cost-Effectiveness Acceptability Curve for Semaglutide 2.4 mg vs Diet and Exercise

Subgroup: Non-T2D at baseline



Subgroup: T2D at baseline



Note: Line graph. X-axis: willingness-to-pay threshold (0-¥10M). Y-axis: Probability Cost-Effective (%).

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