

# Cost-Effectiveness Analysis of Once-weekly Subcutaneous Semaglutide Versus Dulaglutide in Patients with Type 2 Diabetes with Inadequate Glycemic Control in China



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## INTRODUCTION

- Once-weekly (OW) subcutaneous semaglutide is an injectable glucagon-like peptide-1 (GLP-1) analogue, the efficacy of which has been shown in the Semaglutide Unabated Sustainability in Treatment of Type 2 Diabetes (SUSTAIN) trial program that comprises ten reported phase 3 global clinical trials<sup>1</sup>.
- In the SUSTAIN 7<sup>2</sup> randomized controlled trial and its post-hoc analysis<sup>3</sup>, OW semaglutide 0.5mg showed similar reduction in glycated hemoglobin (HbA<sub>1c</sub>) and body weight comparing dulaglutide 1.5mg, while OW semaglutide 1.0mg was associated with greater reduction in glycated hemoglobin (HbA<sub>1c</sub>) and body weight in people with type 2 diabetes mellitus (T2DM) comparing dulaglutide 1.5mg.

## OBJECTIVE

- To assess the long-term cost-effectiveness of OW semaglutide 0.5mg and 1.0mg versus dulaglutide 1.5mg for the treatment of type 2 diabetes, based on the head-to-head SUSTAIN 7 trial, from the Chinese healthcare perspective, to inform healthcare decision making in China.

## METHODS

- The Swedish Institute of Health Economics Diabetes Cohort Model (IHE-DCM) was used to evaluate the long-term cost and health outcomes of OW semaglutide and dulaglutide. Analysis was conducted from the perspective of Chinese healthcare system over a time horizon of 40 years.
- Data of baseline characteristics and treatment effects of OW semaglutide and dulaglutide were sourced from the SUSTAIN 7 clinical trial, among which 15.6% were Asian Indian.Treatment costs and costs of complications were sourced from bidding price and previous publications<sup>4-7</sup>, and all inflated to 2020 CNY. Future costs and outcomes were discounted at 5% per annum.
- Key model assumptions: (1)patients were assumed to initiated treatment with either OW semaglutide or dulaglutide and then switch to basal insulin after one year (considering the clinical practice in China that a mean duration of treatment with GLP-1 RA of about 7 months<sup>8</sup>); (2)HbA<sub>1c</sub> was assumed to increase annually at a rate of 0.14%; (3) UKPDS 82 risk equations was applied to simulate the mortality, micro-and macrovascular complications.
- The research results were evaluated through one-way sensitivity analysis and probabilistic sensitivity analysis.

## RESULTS

- Over a timeframe of 40 years, both doses of OW semaglutide were associated with lower cumulative incidences of micro-and macrovascular complications and mortality. (Table 1).
- Compared with dulaglutide 1.5mg, OW semaglutide 0.5mg and 1.0mg were associated with improvements in discounted life expectancy of 0.04 and 0.09 years, respectively, and discounted quality-adjusted life expectancy of 0.08 and 0.19 QALYs, respectively (Table 2).
- Clinical benefits were achieved at reduced costs, with lifetime total cost savings of 6,744 CNY with OW semaglutide 0.5mg and savings of 10,818 CNY with OW semaglutide 1.0mg, resulting from the reduction of diabetes-related complications (Table 2).
- Sensitivity analysis verified the robustness of the research result (Figure 1&2). At a willingness-to-pay threshold of 1 time GDP per capita (CNY 72,477) per QALY gained, the probabilities of being cost-effective for OW semaglutide 0.5mg and 1.0mg relative to dulaglutide 1.5mg were both of 100%.

**Table 1. Relative Risk Reduction of Micro- and Macrovascular Complications and Mortality**

Item	Difference (OW semaglutide 0.5mg VS. Dulaglutide 1.5mg)	Difference (OW semaglutide 1.0mg VS. Dulaglutide 1.5mg)
<b>Mortality</b>		
Overall Mortality	-0.24%	-0.67%
Cardiovascular Event Mortality	-0.32%	-0.85%
<b>Microvascular Complications</b>		
<b>Eye Disease</b>		
Background Retinopathy	-2.49%	-6.65%
Proliferative Retinopathy	-0.54%	-1.36%
Macular Edema	-1.48%	-3.81%
Proliferative Retinopathy & Macular Edema	-0.72%	-1.77%
Severe Visual Loss	-0.46%	-1.16%
<b>Lower Extremity Disease</b>		
Symptomatic Neuropathy	-0.67%	-1.76%
Lower Extremity Amputation	-0.34%	-0.87%
<b>Kidney Disease</b>		
Microalbuminuria	-1.30%	-3.65%
Macroalbuminuria	-1.67%	-4.34%
End Stage Renal Disease	-0.80%	-2.02%
<b>Macrovascular Complications</b>		
Ischemic Heart Disease	-0.04%	-0.14%
Myocardial Infarction		
First Myocardial Infarction	-0.37%	-0.97%
Second or Subsequent Myocardial Infarction	-0.17%	-0.21%
Stroke		
First Stroke	-0.18%	-0.73%
Second or Subsequent Stroke	-0.04%	-0.21%
Heart Failure	-0.36%	-0.82%
Cardiovascular Disease (Myocardial Infarction & Stroke)	-0.48%	-1.41%

**Table 2. Base Case Results**

Health Outcomes	OW semaglutide 0.5mg +metformin	Dulaglutide 1.5mg+metformin	Incremental
Life years (year)	12.80	12.76	0.04
QALYs	7.16	7.08	0.08
Total direct medical cost (CNY)	364,773	371,522	-6,744
Treatment Cost	183,083	184,269	-1,186
Microvascular Cost	89,722	94,236	-4,514
Macrovascular Cost	91,968	93,018	-1,049
ICER (CNY/QALY gained)	-	-	Dominant

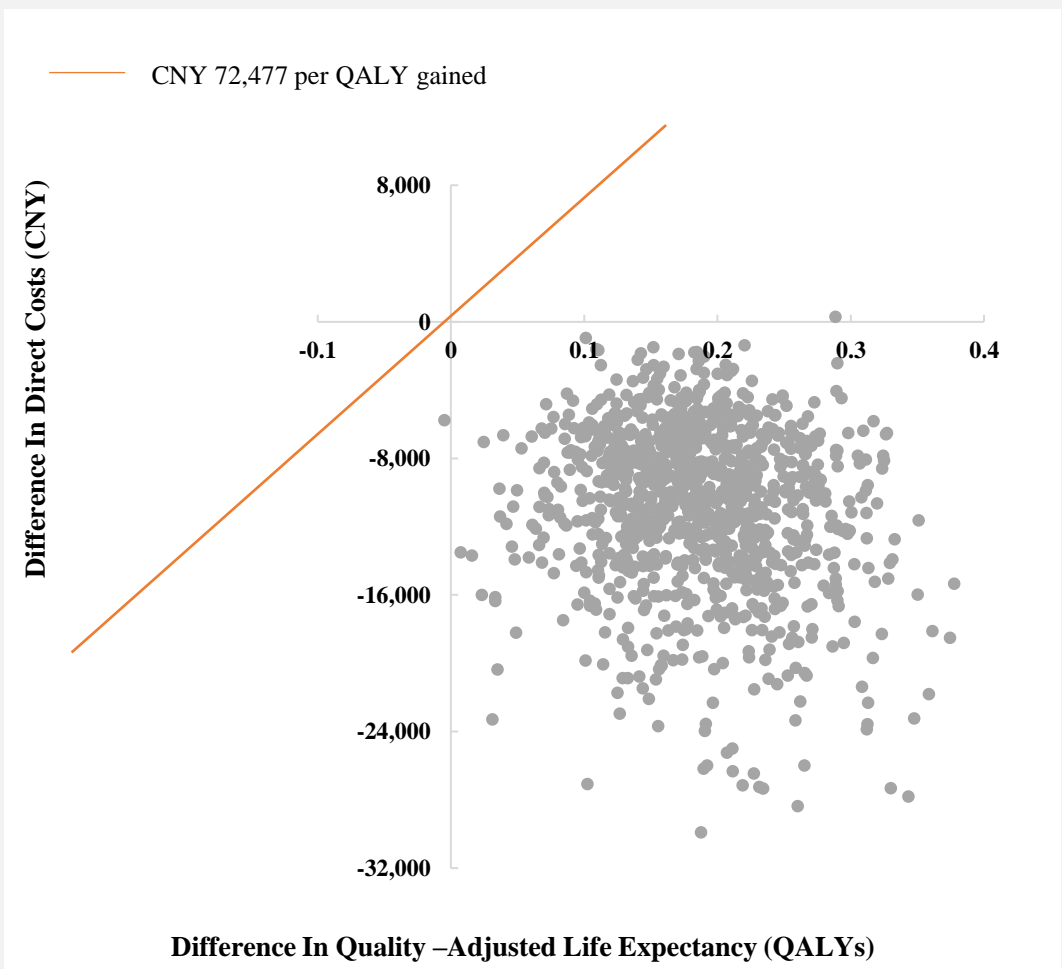
Health Outcomes	OW semaglutide 1.0mg +metformin	Dulaglutide 1.5mg+metformin	Incremental
Life years (year)	12.86	12.76	0.09
QALYs	7.27	7.08	0.19
Total direct medical cost (CNY)	360,705	371,522	-10,818
Treatment Cost	187,971	184,269	3,702
Microvascular Cost	81,882	94,236	-12,354
Macrovascular Cost	90,851	93,018	-2,166
ICER (CNY/QALY gained)	-	-	Dominant

**Table 3. Results of One-way Sensitivity Analysis**

Analysis	ICER (OW semaglutide 0.5mg VS. Dulaglutide 1.5mg)	ICER (OW semaglutide 1.0mg VS. Dulaglutide 1.5mg)
Base case	Dominant	Dominant
30-year time horizon	Dominant	Dominant
0% discount rates	Dominant	Dominant
3% discount rates	Dominant	Dominant
Annual drift in HbA <sub>1c</sub> 0.1%	Dominant	Dominant
Annual drift in HbA <sub>1c</sub> 0.2%	Dominant	Dominant
HbA1c drift using UKPDS progression	Dominant	Dominant
Upper 95% CI of HbA1c estimated treatment difference	Dominant	Dominant
Lower 95% CI of HbA1c estimated treatment difference	Dominant	Dominant
Upper 95% CI of BMI estimated treatment difference	Dominant	Dominant
Lower 95% CI of BMI estimated treatment difference	Dominant	Dominant
HbA <sub>1c</sub> threshold 7%	Dominant	Dominant
UKPDS 68 risk equations applied	Dominant	Dominant
Deng et al. <sup>9</sup> BMI disutility applied	Dominant	Dominant



**Figure 1. Probabilistic sensitivity analyses scatter plot. CNY 2020 RMB sterling, QALY quality-adjusted life-year (OW semaglutide 0.5mg VS. Dulaglutide 1.5mg)**



**Figure 2. Probabilistic sensitivity analyses scatter plot. CNY 2020 RMB sterling, QALY quality-adjusted life-year (OW semaglutide 1.0mg VS. Dulaglutide 1.5mg)**

## CONCLUSIONS

This study showed that OW semaglutide 0.5mg and OW semaglutide 1.0mg were estimated to be cost-saving treatment options versus dulaglutide 1.5mg in patients with type 2 diabetes uncontrolled on metformin monotherapy in China.

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