COST-EFFECTIVENESS OF INSULIN DEGLUDEC (U100) COMPARED WITH INSULIN GLARGINE (U100) IN GREECE

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Introduction

- Diabetes mellitus (DM) is a chronic disorder characterized by hyperglycaemia.
- Despite the advances in its treatment over the past few decades, DM continues to impose a significant clinical burden, while the economic consequences to the health care system are substantial. The DM-related healthcare spending in Greece was estimated to be USD 3.9 billion in 2010, i.e. approximately 9% of the total healthcare expenditure, and it is projected to rise to USD 4.6 billion by 2030 [1].

Objective

- To evaluate the cost-effectiveness of insulin degludec (IDeg U100) versus insulin glargine (IGlar U100) in patients with: type 1 diabetes using a basal bolus regimen ($T1DM_{B/B}$), and type 2 diabetes receiving basal oral treatment ($T2DM_{BOT}$) or basal-bolus therapy ($T2DM_{B/B}$) in Greece.

Methods

- Meta-analysis data from phase 3a clinical studies [2] were used in a simple and transparent short-term cost-utility model (Fig. 1).
- The costs and effects of treatment with IDeg (U100) versus IGlar (U100) were calculated annually.
- Quality-adjusted life-year (QALYs) were estimated by applying a disutility representing a reduction in quality of life per hypoglycaemic event, and an estimate of the utility benefit of the flexible dosing time option with IDeg (U100).
- The analysis was conducted from the healthcare payer perspective, and costs were based on the respective reimbursement prices of National Organization For Health Care Benefits Provision (EOPYY, June 2016).
- One-way and probabilistic sensitivity analyses were performed to examine the robustness of the results.

Results

- Base case incremental cost-effectiveness ratios (ICERs) were estimated at 8,883 € per QALY in the $T1DM_{B/B}$, at 5,379 € per QALY in the $T2DM_{BOT}$ and at 16,265 € per QALY in the $T2DM_{B/B}$ treatment groups (Table 1).
- Sensitivity analyses indicated that the results were quite robust to reasonable changes in model parameters, with all of the calculated ICERs falling below a commonly accepted willingness-to-pay (WTP) threshold (33,000 € per QALY gained) in all therapy regimens (Table 2).
- The probability that IDeg was cost-effective compared with IGlar was 68.5%, 98%, and 88.5% in the $T1DM_{B/B}$, $T2DM_{BOT}$ and $T2DM_{B/B}$ therapy regiments, respectively (Fig. 2).

Conclusions

- IDeg (U100) was found to be a highly cost-effective alternative therapy option compared with IGlar (U100) in $T1DM_{B/B}$, $T2DM_{BOT}$ and $T2DM_{B/B}$ treatment groups in Greece from the healthcare payer perspective over an 1-year time horizon.

References

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Disclosure

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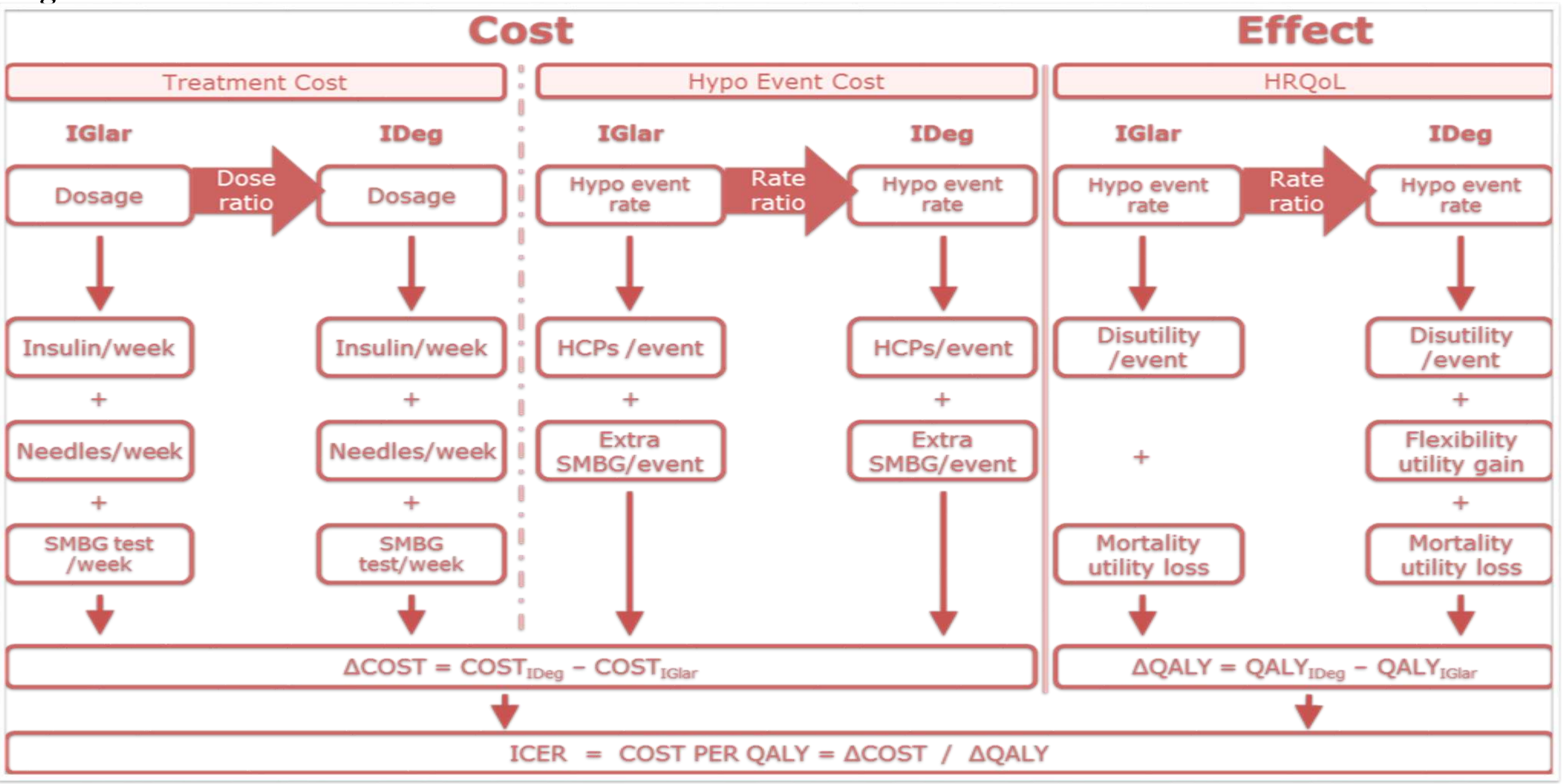
Methods

Fig. 1. Cost-effectiveness model overview



Abbreviations: Δ, change in; HCP, healthcare professional; HRQoL, health-related quality of life; ICER, incremental cost-effectiveness ratio; IDeg, insulin degludec; IGlar, insulin glargine; QALY, quality-adjusted life year; SMBG, self-monitored blood glucose.

Results

Table 1. Base case cost-effectiveness results

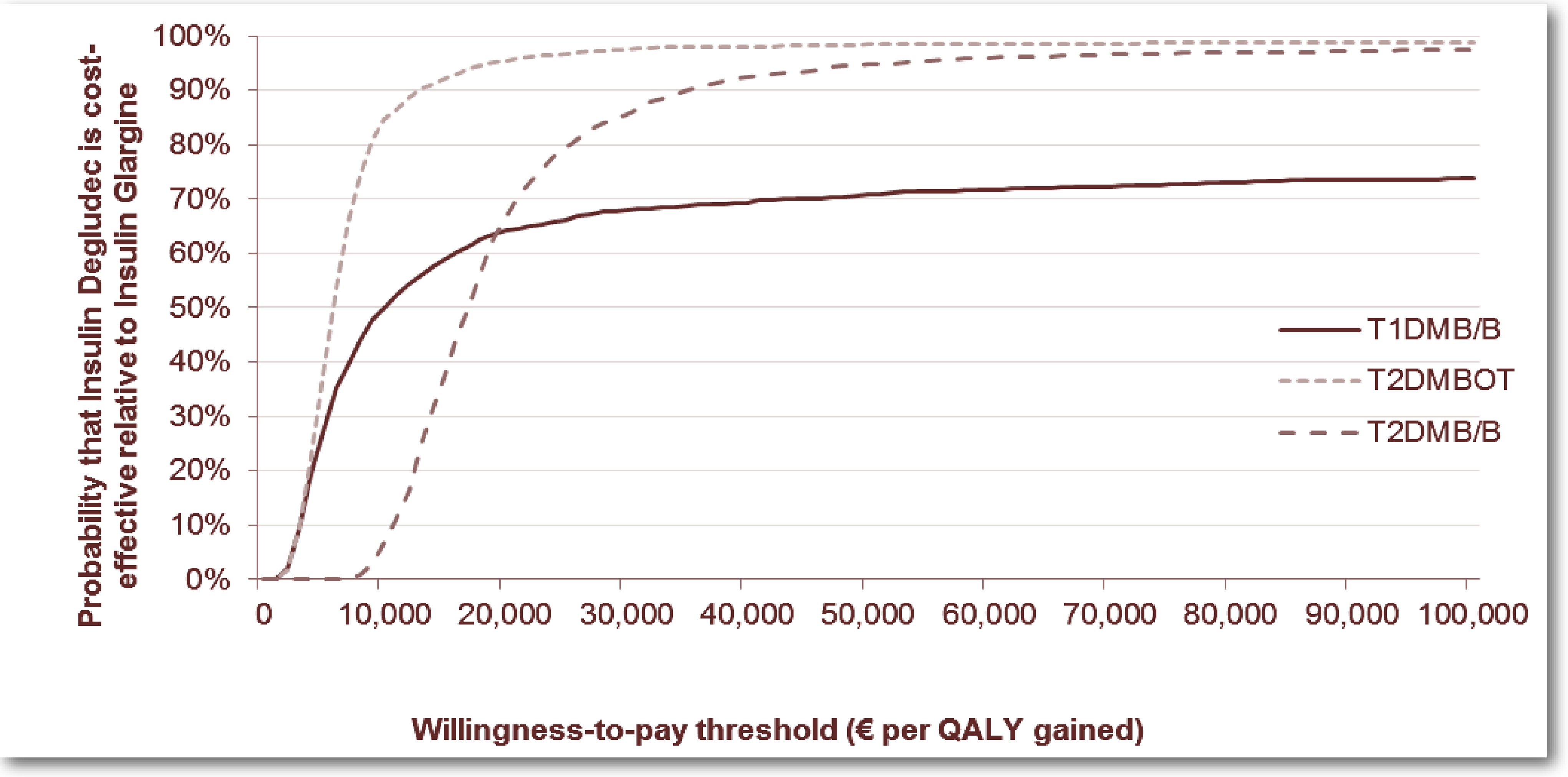
	Incremental cost (Δcost=IDeg–IGlar)	Incremental effectiveness (ΔQALYs=IDeg–IGlar)	ICER (Δcost/ΔQALY)
$T1DM_{B/B}$	175.81 €	0.0198	**8,883 €**
$T2DM_{BOT}$	125.42 €	0.0233	**5,379 €**
$T2DM_{B/B}$	574.02 €	0.0353	**16,265 €**

Table 2. ICER results of the sensitivity analyses

Healthcare payer perspective		ICER (€ per QALY gained) $T1DM_{B/B}$	$T2DM_{BOT}$	$T2DM_{B/B}$
Hypoglycaemia disutility				
Base case: Severe = 0.0565, non-severe daytime = 0.0041 and non-severe nocturnal = 0.0067	Base case +50%	6.587 €	3.949 €	11.495 €
	Base case -50%	13.633 €	8.431 €	27.804 €
Injection frequency				
Base case: IGlar 1/day, IDeg 1/day	IGlar: 2/day	Dominant	Dominant	9.804 €
Insulin doses				
Base case: $T1DM_{B/B}$ basal 13% difference and bolus 12% difference, $T2DM_{BOT}$ basal 10% difference and $T2DM_{B/B}$ arm basal 8% difference in mean doses, respectively	Equal mean doses	16.257 €	10.647 €	12.682 €
Hypoglycaemia rates				
Base case: Nocturnal hypoglycaemia: 13.36%, 24.66% and 13.43% for $T1DM_{B/B}$, $T2DM_{BOT}$ and $T2DM_{B/B}$, respectively	Nocturnal proportion of hypoglycaemia increased by 25%	7.542 €	4.727 €	15.743 €
	Nocturnal proportion of hypoglycaemia decreased by 25%	10.788 €	6.224 €	16.823 €
Hypoglycaemia direct costs				
Base case costs based on clinical trial resource use	Cost per hypoglycaemic event +20%	8.880 €	4.846 €	16.251 €
	Cost per hypoglycaemic event –20%	8.885 €	5.912 €	16.280 €
Base case of additional SMBG tests per week: 1,46, 1,91, and 1,98 for $T1DM_{B/B}$, $T2DM_{BOT}$ and $T2DM_{B/B}$ respectively	Fulcher et al. [3]: 6,7 and 6 for $T1DM_{B/B}$, and $T2DM_{B/B}$, respectively	8.542 €	n/a	15.697 €
	Orozco-Beltran et al.[4]: 5, 6 and 7.1 for $T1DM_{B/B}$, $T2DM_{BOT}$ and $T2DM_{B/B}$, respectively.	8.652 €	5.173 €	15.686 €
SMBG rates per week (IDeg/IGlar)				
Base case: $T1DM_{B/B}$, 7/7; $T2DM_{BOT}$ and $T2DM_{B/B}$, 1/7	$T2DM_{BOT}$ and $T2DM_{B/B}$, 2/7	n/a	6.777 €	17.189 €
	No difference in testing	n/a	13.770 €	21.804 €
Flex utility				
Base case: +0.006 utility achieved by 100% of the population	Evans et al. [5]: $T2DM_{BOT}$ + 0.016 and $T2DM_{B/B}$ + 0.013	n/a	3.764 €	13.573 €
	50% use the flexible dose option (0.003 utility)	10.469 €	6.173 €	17.777 €
	0% use the flexible dose option (0.000 utility)	12.746 €	7.242 €	19.597 €

N/a: not applicable; SMBG: self-monitored blood glucose; IGlar: insulin glargine; ¥ QALYs calculated from utilities obtained from SF-36; † QALYs calculated from hypoglycaemic events disutilities.

Fig. 2. Cost-effectiveness acceptability curves – insulin degludec (IDeg) versus insulin glargine (IGlar)



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