

Cost Effectiveness of Sensor Augmented Pump Therapy with Predictive Low Glucose Suspension (PLGS) in the Management of Type 1 Diabetes (T1D) in Bulgaria

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1. OBJECTIVE

Sensor-augmented pump therapy (SAP) combines continuous glucose monitoring with continuous subcutaneous insulin infusion (CSII). SAP is costlier than CSII but provides additional clinical benefits over CSII alone.

This study aims to determine whether SAP therapy with PLGS algorithm (MiniMed™ 740G System*) is cost-effective versus CSII in people living with T1D in Bulgaria.

2. METHODS

A cost effectiveness analysis was performed using the validated IQVIA CORE Diabetes Model. Clinical and economic inputs were derived from published literature and expert opinion.

Separate analyses were performed for hypoglycemic (baseline hypoglycemic event [HE] rate 90/100-patient-years) with baseline HbA1c 7.5% and hyperglycemic (baseline HE rate 10/100-patient-years) with baseline HbA1c 9% cohorts, using a patient-lifetime time horizon. Analyses considered the payer's perspective. Future costs and clinical outcomes were discounted at 3.5% per annum.

3. RESULTS

The between arm difference in HbA1c reduction was assumed to be -0.56% for hypoglycemic and -0.75% for hyperglycemic cohorts, favouring SAP therapy, based on the formulae derived from a meta-analysis (1). An 83% reduction of HE rates with SAP vs CSII was assumed for both cohorts (2).

- SAP was projected to lead to an incremental gain of 2.14 quality-adjusted life years (QALYs) in the hypoglycemic cohort and of 1.13 QALYs in the hyperglycemic cohort.
- SAP usage increased the mean years of life free from complications, leading up to 3-years and 5-years delay in complications onset versus CSII for hypoglycemic and hyperglycemic cohorts, respectively.
- Higher mean lifetime direct costs for SAP versus CSII resulted in projected incremental cost-effectiveness ratios (ICER) of €40,206/QALY-gained for hypoglycemic and €74,403/QALY-gained for hyperglycemic cohorts. (See Figure 1a & 1b for ICER Scatterplots)
- Extensive deterministic and probabilistic sensitivity analyses (SA) confirmed the robustness of results. The most sensitive parameter was the cost of SAP therapy, followed by the intervention effects.

Figure 1a. ICER Scatterplot for [hypoglycemic cohort](#)

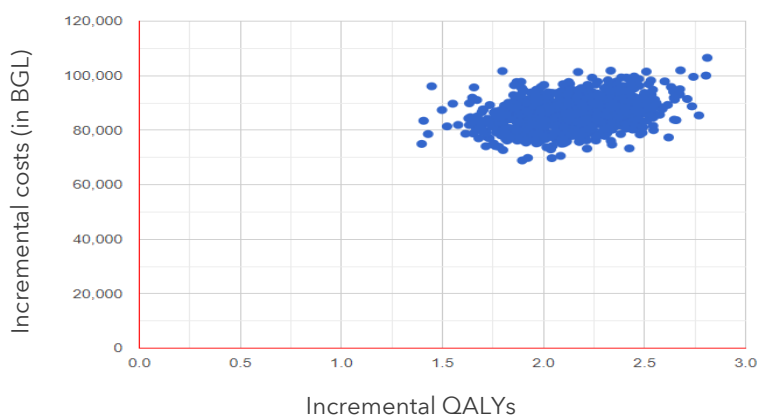


Figure 1b. ICER Scatterplot for [hyperglycemic cohort](#)

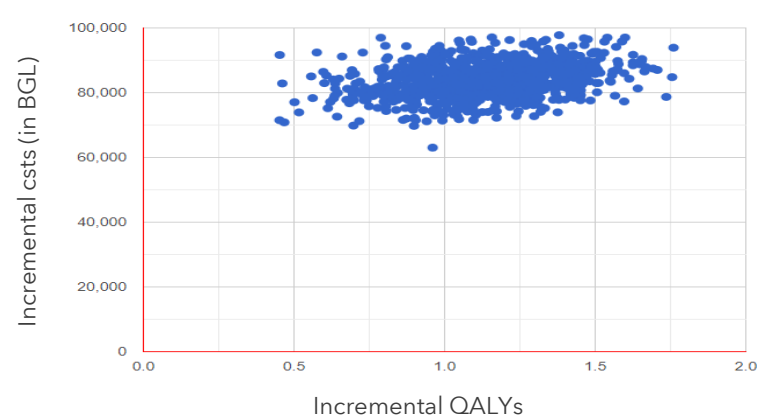


Figure 2a. SA Tornado Graph for [hypoglycemic cohort](#)

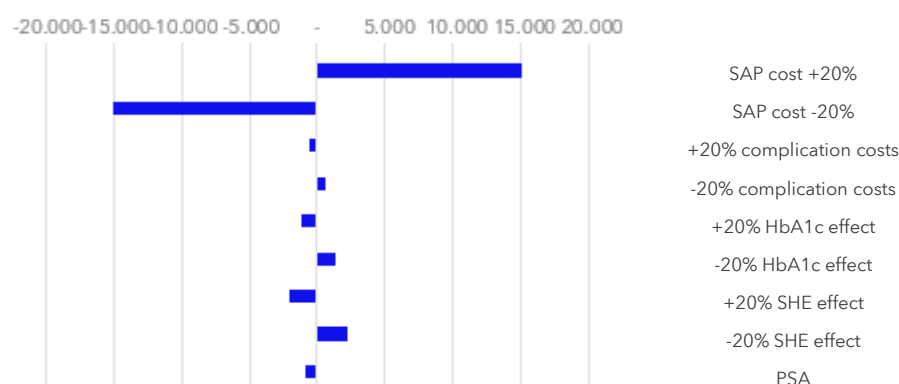
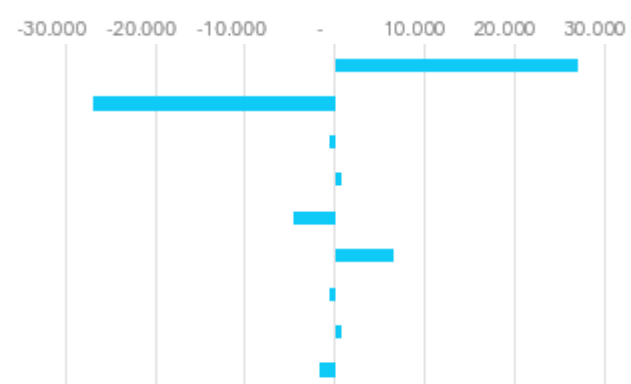


Figure 2b. SA Tornado Graph for [hyperglycemic cohort](#)



4. CONCLUSIONS

In Bulgaria, SAP therapy with MiniMed™ 740G System* likely represents good value for money versus CSII in T1D management, particularly for the patients experiencing frequent and/or problematic hypoglycemic events.

*The MiniMed 740G insulin pump is intended for continuous delivery of basal insulin and administration of insulin boluses for the management of diabetes mellitus in persons of all ages requiring insulin. SAP is used to refer "SAP with PLGS algorithm" in the poster.

References: 1. Pickup JC. et al. BMJ. 2011;343:d3805. 2. Choudhary P. et al. Diabetes Technol Ther. 2016 May;18(5):288-91