COST OFFSET ANALYSIS (COA) COMPARING REAL-TIME CONTINUOUS GLUCOSE MONITORING (RT-CGM) WITH SELF-MONITORING OF BLOOD GLUCOSE (SMBG) IN PEOPLE WITH TYPE 1 DIABETES IN EIGHT COUNTRIES

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Objective

A cost offset analysis (COA) was performed comparing potential clinical cost offsets for an rt-CGM system compared with SMBG alone in people with Type 1 Diabetes (T1D) and uncontrolled glycemia, in eight countries (n=5,000 per country), over a one-year time period.

Methods

Clinical effects for HbA_{1c} reduction from rt-CGM and SMBG were -1.0% and -0.4%, respectively, and taken from a recently published RCT.[1] HbA_{1c} reductions for rt-CGM and SMBG were converted into an economic benefit based on a US study,[2] adjusted for the Organization for Economic Cooperation and Development (OECD) healthcare purchasing power parity along with 2019 exchange rates for non-US countries. Reduced hospitalization rates for severe hypoglycemia (SH; -73%) and diabetic ketoacidosis (DKA; -80%) were taken from a recent observational study in Belgium where SMBG was used in the year prior to countrywide reimbursement of rt-CGM and followed subsequently for one year.[3] Costs attributable to HbA_{1c} reduction, SH and DKA hospitalizations were taken from country-specific published literature and inflated to 2019 values.[4-20]

Results

The modeling results for population-based and per T1D person cost offsets are summarized in Table 1. The reduction in SH hospitalization rate using rt-CGM over SMBG yielded an annual 437 fewer SH hospitalizations per country. The reduction in DKA hospitalization rate using rt-CGM over SMBG yielded an annual 179 fewer DKA hospitalizations per country. Projected annual cost offsets per person with T1D using rt-CGM over SMBG with ranges corresponding to low and high end HbA_{1c} reduction were as follows: Australia, $1,216-$1,435; Canada, $1,195-$1,404; France, €953-€1,096; Germany, €911-€1,079; Italy, €960-€1,064; Spain, €722-€821; UK, £605-£720; USA, $1,535-$1,867.

Table 1: Potential Cost Offsets for Reduced HbA_{1c}, SH and DKA Hospitalizations for Hypothetical Cohorts of People with T1D (n=5,000) in Eight Countries (All currencies adjusted to 2019)

Country	Low End HbA_{1c} Cost Offset	High End HbA_{1c} Cost Offset	Cost Reduction for 437 Fewer Severe Hypo. Hospitalizations	Cost Reduction for 179 Fewer DKA Hospitalizations	Total Cost Offsets per Country: Low End HbA_{1c} + SH + DKA	Total Cost Offsets per Country: High End HbA_{1c} + SH + DKA	Total Cost Offsets per person per year: Low End HbA_{1c}	Total Cost Offsets per person per year: High End HbA_{1c}
Australia ($AU)	$2,831,552	$3,926,973	$1,133,207[4]	$2,166,132[5]	$6,080,891	$7,176,312	$1,216	$1,435
Canada ($CA)	$2,704,678	$3,751,016	$1,016,574[6]	$2,251,827[7]	$5,973,079	$7,019,418	$1,195	$1,404
France (€)	€1,857,319	€2,575,846	€1,879,693[8]	€1,026,782[9]	€4,763,794	€5,482,321	€953	€1,096
Germany (€)	€2,170,742	€3,010,520	€1,628,090[10-11]	€756,161[12]	€4,554,993	€5,394,771	€911	€1,079
Italy (€)	€1,342,687	€1,862,122	€2,578,319[13]	€877,770[14]	€4,798,776	€5,318,211	€960	€1,064
Spain (€)	€1,276,907	€1,770,894	€1,599,653[15]	€732,543[16]	€3,609,103	€4,103,091	€722	€821
UK (£)	£1,484,480	£2,058,769	£1,142,282[17]	£399,573[18]	£3,026,334	£3,600,624	£605	£720
USA ($US)	$4,299,350	$5,962,607	$1,702,572[19]	$1,671,265[20]	$7,673,187	$9,336,444	$1,535	$1,867

Conclusions

Our modelling study demonstrates significant potential clinical and economic benefits for rt-CGM compared with SMBG in people with T1D which may provide compelling information for healthcare decision makers in each country.

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