TYPE 2 DIABETES IN TURKEY – A COST OF ILLNESS STUDY

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BACKGROUND & OBJECTIVES

- The rise in type 2 diabetes (T2DM) in Turkey and surrounding regions represents a heavy burden for the healthcare budget. This has been emphasised by a recent government report which estimated that diabetes cost nearly 10 billion Turkish lira (TL).[1]
- This analysis aims to estimate the cost of managing T2DM and its complications in Turkey. Healthcare resource use data from the International Diabetes Management Practice Study (IDMPS) wave 5 was used to conduct a cost of illness study for Turkish population on national and patient levels.

METHODS

- The IDMPS is an ongoing international, multicentre, observational study, which has been conducted for the past ten years in developing countries. This analysis included cross-sectional data from 842 adults with T2DM from Turkey.
- Diabetes-related healthcare resource use items included *monitoring* (blood lipid, blood pressure (BP) and HbA1c tests and blood glucose self-monitoring), *screening for complications* (cardiovascular diseases, eyes, nerve damages, kidney damages and foot examinations), *visits* (GP, specialists and educator visits), *medications* (insulin, non-insulin diabetes-related medications and medications for complications), control of BP and lipids) and *diabetes-related complications*. Additionally, *productivity losses* (unemployment due to diabetes and number of sick leaves per year) were included. Hospitalisations and emergency rooms (ER) visits were not taken into account in costs.
- Costs were obtained from published literature and IMS data were reported in 2015 Turkish lira (TL).[2, 3] Mean annual costs per patient were calculated by multiplying the unit costs by the mean annual estimates of consumption for all healthcare used items from the IDMPS. Mean annual costs per patient were then multiplied by the total number of diagnosed and treated T2DM patients in Turkey (3,069,397) to obtain cost at a national level.[4]

RESULTS

- 842 patients were included in the analyses , 55.5% were females; mean (SD) age was 57.4 (11.4); mean (SD) diabetes duration was 8.7 (6.8) years (Table 1).
- Utilisation monitoring and outpatient care is shown in Table 2.

Table 1. Demographic data by type of treatment

	OAD alone N=441	Insulin alone N=148	OAD + Insulin N=241	Total N=842
Age (years), mean ± SD	57.0 ± 11.4	60.7 ± 12.8	56.1 ± 10.0	57.4 ± 11.4
Gender, n (%) of males	186 (42.2%)	82 (55.4%)	102 (42.3%)	375 (44.5%)
BMI, kg/m²	30.9 ± 5.5	30.0 ± 6.0	31.4 ± 6.1	30.9 ± 5.8
Time since diagnosis (years), mean ± SD	6.5 ± 5.5	11.8 ± 7.5	11.2 ± 7.1	8.7 ± 6.8
Patients with diabetes family history (affecting 2 or 3 generations), n (%)	230 (52.1%)	86 (58.1%)	143 (59.3%)	467 (55.5%)
Patients with at least one complication, n (%)	146 (33.1%)	99 (66.9%)	150 (62.2%)	397 (47.1%)

Table 2. Monitoring and outpatient care

Screening, visits and tests	% patients (12m)	Mean annual number per patient (12m)
Eye screening	71.1%	1.42
Nerve damage	46.9%	1.41
Kidney damage	73.6%	2.07
Foot examinations	57.1%	1.73
SMBG testing (per day)	73.3%	1.72
Blood lipid tests	83.8%	2.43
Blood pressure tests	55.6%	2.72
HbA1c tests	95.6%	2.53
GP visits	75.5%	4.12
Specialist visits	34.6%	1.20
Educator visit	55.6%	1.00

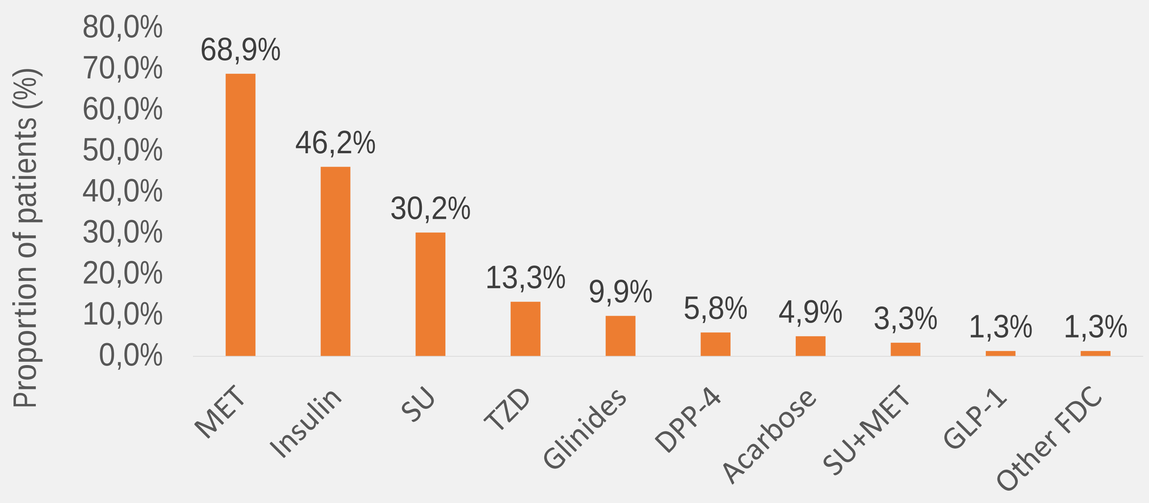
- 47.1% of patients experienced at least one complication due to diabetes, hypoglycaemia (34.3%), retinopathy (23.0%) and sensory neuropathy (11.2%), being most common (Table 3).
- Unemployment due to diabetes was reported in 5.1% of patients; 4.4% had at least one sick leave due to diabetes or complications (10.1 sick days in average in the past 3 months).
- 68.9% of patients were treated with metformin outside a fixed dose combination (FDC), 46.2% with insulin, 30.2% with sulfonylureas and 13.3% with thiazolidinedione (Figure 1).
- Of all patients 11.8% were treated with basal alone, 15.8% with premix, 16.7% with basal and prandial and 1.9% with other combinations of prandial, basal or premix.

Table 3. Complications and hospitalisations

Diabetes-related complications	% with complication	% hospitalised in the past 3m
All complications	47.1%	6.1%
Hypoglycaemia	34.3%	3.2%
Retinopathy	23.0%	3.1%
Sensory neuropathy	11.2%	3.2%
Microalbuminuria	6.5%	-
Proteinuria	3.6%	-
Dialysis	0.5%	3.1%
Amputation	0.5%	3.3%
Foot ulcer	2.7%	-
Angina	3.8%	-
MI/ACS	4.2%	3.3%
Heart failure	3.3%	3.2%
Stroke	0.6%	3.3%
PVD	2.4%	3.1%
Revascularisation	3.1%	-

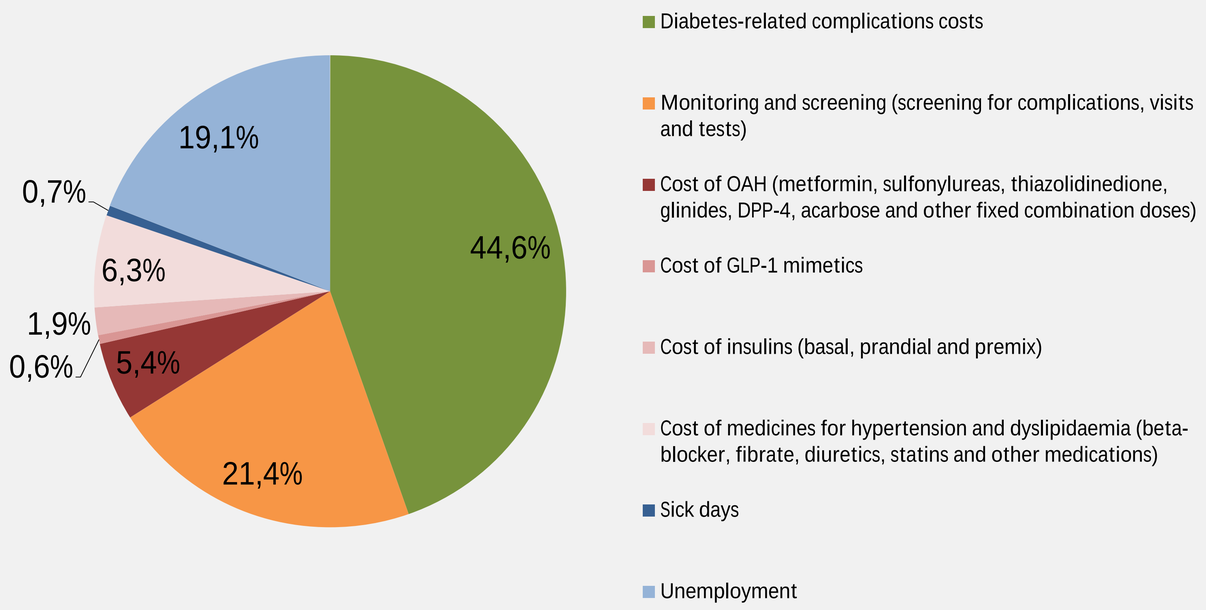
*Foot ulcers and amputations; ACS: acute coronary syndrome; GP: general practitioner; SMBG: self-monitoring blood glucose; MI: Myocardial infarction; PVD: peripheral vascular disease

Figure 1. Medication use



SU: Sulfonylureas, TZD: Thiazolidinedione, MET: Metformin, FDC: Fixed Dose Combinations.

Figure 2. Total costs distribution



- Total cost was estimated at 9,056,237,801 TL (€2,753,712,115)* on a national level. Overall mean annual cost per patient was estimated at 2,950 TL (€897)*. Mean annual cost was 3,943 TL (€1,198)* for patients with complications and 1,444 TL (€439)* for patients without complication.
- As a proportion of total costs, management of complications accounted for 44.6% of total costs; monitoring and screening for complications - 21.4%; unemployment due to diabetes - 19.1%; diabetes-related treatments - 7.3% (see Figure 2).
- Direct costs accounted for 80% of total cost. Indirect costs included unemployment due to diabetes and sick days.

CONCLUSIONS

The findings of this study a significant economic burden of T2DM in Turkey is significant at a personal and national levels. Our estimates support previously publish data and highlight the high burden which the disease poses. Direct costs and productivity losses were found to be substantial. The burden of complications, claims for optimisation of care, implementation of screening and prevention strategies.

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*European Central Bank currency exchange, October 2016 (1 TL = 0.3046 Euro)