Diabetology

Extended Abstract

Global and regional estimates and projections of diabetes-related health expenditure: Results from the International Diabetes Federation Diabetes Atlas, 9th edition- Pouya Saeedi- International Diabetes Federation, Brussels, Belgium

Pouya Saeedi

Abstract

Diabetes and its complications have a significant economic impact on individualsand their families, health systems and national economies.Methods:The direct health expenditure of diabetes was calculated relying on the followinginputs: diagnosed and undiagnosed diabetes prevalence estimates, United Nations popula-tion estimates, World Health Organization health expenditure per capita and ratios ofhealth expenditure for people with diabetes compared to people without diabetes.Results:The estimated global direct health expenditure on diabetes in 2019 is USD 760 bil-lion and is expected to grow to a projected USD 825 billion by 2030 and USD 845 billion by2045. There is a wide variation in annual health expenditures on diabetes. The UnitedStates of America has the highest estimated expenditure with USD 294.6 billion, followedby China and Brazil, with USD 109.0 billion and USD 52.3 billion, respectively. The age groupwith the largest annual diabetes-related health expenditure is 60–69 years with USD 177.7billion, followed by 50–59 years, and 70–79 years with USD 173.0 billion and USD 171.5 bil-lion, respectively. Slightly higher diabetes-related health expenditure is seen in womenthan in men (USD 382.6 billion vs. USD 377.6 billion, respectively). The same difference isexpected to be present in 2030 and 2045. The significant economic impact of diabetes and, particu-larly, both its acute and long-term complications on healthexpenditures are well known, from early estimates reportedfrom pan-European studies[5]to, for example, the most recentassessment for the United States of America[6]. In this assess-ment, the costs of hospital admissions for these complicationsis the over-riding influence. Since many of these complicationscan beprevented, orat leastlessened in impactordelayed, theireconomic impact can potentially be significantly reduced andresources diverted to preventive measures or to other healthpriorities. The importance of addressing socio-economic disad-vantage in the prevention of type 2 diabetes mellitus hasrecently been highlighted by Spencer Bonillaet al[7].As examples, the costs of treating a single case of diabeticketoacidosis (DKA) in the United Kingdom is estimated to beGBP 1,387 (around USD 1,750)[8]. In the United States ofAmerica, diabetes-related Chronic Kidney Disease (CKD)increases mean annual healthcare expenditures by 49%among people with diabetes and clinical nephropathy thanamong those with no nephropathy and, for people with dia-betes undergoing dialysis, the mean annual figure increased2.8 times compared with end-stage renal disease (ESRD)patients not on dialysis[9]. Neurological and / or vasculardamage to the lower limb resulting in the "diabetic foot"havebeen described as the most costly of diabetes-specific compli-cations. Compared to people with diabetes without footulcers, health expenditures for people with diabetes and footulcers is 5.4 times higher in the year of the first episode and2.6 times higher in the year of the second episode and com-pared to people without diabetes[10]. Furthermore, the costof care for people with diabetes and coronary heart diseaseor congestive heart failure is higher[11]

The aims of this paper, therefore, are (1) to draw attentionto these recent IDF global estimates and projections of thedirect costs of diabetes care in adults 20–79 years; (2) to pro-vide details of the methods used in the formulation of theseestimates and projections so that, with critical discussion,their precision can be improved and (3) to compare theseresults with others which have used different approaches.

The methods used in estimating diabetes-related healthexpenditures has remained basically consistent, with someminor modifications since their description in detail in thethird edition of the IDF Diabetes Atlas[3]. The focus of thispaper is on direct medical costs attributable to diabetes,which represent the opportunity costs of health careresources used for treating diabetes, diabetes-related

Pouya Saeedi
international Diabetes Federation, Brussels, Belgium E-mail: pouya.saeedi@idf.org

compli-cations, and comorbidity. Direct medical costs include hospi-tal inpatient care, physician inpatient care, physicianoutpatient care, emergency department visits, nursing homecare, hospice care, rehabilitation care, specialists' and otherhealth professionals' care, diagnostic tests, prescription drugsand medical supplies.Additional elements in economic studies of diabetes mayalso address direct non-medical costs (costs incurred bypatients and their families that are directly associated withdiabetes but are not medical in nature, such as transportationcosts, relocation expenses and informal care) and productiv-ity losses and intangible costs which refer to patients' psy-chological pain, discomfort, anxiety and distress related todiabetes. Although important, these are not addressed here.

3.1. Global estimates and projections to 2030 and 2045and temporal trends since 2006In 2019, total, world-wide diabetes-related health expenditurewas estimated to be USD 760 billion in adults aged20–79 years, with the majority of the spending among thoseaged 50–79 years (68.7% of that for all ages). The health expen-diture is expected to grow to a projected USD 825 billion peryear by 2030 and USD 845 billion by 2045 (Fig. 1).Despite the fact that some modifications have been madeto the methods used for these 2019 estimates (see Discussionbelow), they are in line with previous IDF Diabetes Atlas esti-mates made in similar, though not identical ways (Fig. 2). Theincrease of the 2019 estimate over that of 2017 equates to4.5%.The age group with the largest annual diabetes-relatedhealth expenditure in 2019 was 60–69 years with USD 177.7billion, followed by 50–59 and 70–79 years with USD 173.0 bil-lion and USD 171.5 billion, respectively. By 2030 diabetes-related health expenditure (for those aged 70–79 years) willexceed that in all age groups and, by 2045, is expected totop USD 250 billion in this age group alone (Fig. 3).In 2019, slightly higher diabetes-related health expendi-tures are seen in women than in men (USD 382.6 billion vs.USD 377.6 billion, respectively). The same difference is pre-sent in 2030 and 2045 (Fig. 4).3.2. Regional and country estimatesDiabetes-related health expenditures in 2019 in the IDFRegions of North America and Caribbean (NAC), Western Paci-fic (WP), and Europe (EUR) together account for 85.2% of theglobal total. The NAC Region has the highest of all IDF Regions(USD 324.5 billion (20–79 years)), which corresponds to 42.7%of the global total. The second highest is the WP Region withUSD 162.2 billion, followed by the EUR Region (USD 161.4 bil-lion), which correspond to 21.3% and 21.2%, respectively, ofthe total global spending.

Diabetology

Extended Abstract

This work is partly presented at 52th Annual Congress on Neuroscience and stroke 2020, December 14, 2020

Pouya Saeedi
international Diabetes Federation, Brussels, Belgium E-mail: pouya.saeedi@idf.org