

# Economic Assessment of Direct Cost of Illness of Diabetes Mellitus at Dessie Referral Hospital, North East Ethiopia - Zinash Alemu - Kazanchis Health Center, Addis Abeba, Ethiopia

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## Abstract

### Background

Diabetes Mellitus is a chronic disorder having major economic burden. Its progression and complication increase the medical cost. Diabetes Mellitus is a group of metabolic disorder characterized by high blood glucose levels result from defect in insulin secretion or action, or both. Accordingly, there are two types and treatment varieties according to the cause [1]. Globally diabetes mellitus is an emerging common chronic illness with an estimated number of 220 million people in 2010. Of these approximately 12.1 million were living in Africa. In Sub Saharan Africa type 2 diabetes accounts for over 90% of diabetes [2]. In Ethiopia, the estimated prevalence of diabetes mellitus in adult population was 1.9% [3] and the total diabetic cases were estimated to be 2.6 million by the year 2025 [4].

Diabetes imposes a large economic burden on the health care system and health spending on diabetes accounted 11.6% of total health expenditure worldwide in 2015 [5,6]. In Latin America and the Caribbean countries the annual estimated number of deaths was 339,035 accounted a loss of 757,096 and United States Dollar (USD) 3 billion discounted years of productive life and cost among persons younger than 65 years respectively in 2000 [7].

The medical cost of diabetes depends on its prevalence, types of drug used, and presence of co-morbidity, compliance of patient and development as well as progression of complication [8]. Diabetes costs approximately USD 10.43 billion direct costs and USD 14.79 billion indirect costs in United Kingdom in 2010/2011 and cost is estimated to be USD 17.98 billion direct USD 24.36 billion in indirect costs in 2035/2036 [9]. Type 2 diabetes mellitus in Iran also costs USD 2.0460.28 billion direct and USD 1.73 million indirect costs with USD 842.66102 and USD 864.8 average cost per capita respectively in 2009 [10].

Unhealthy diet and insufficient physical activity due to non-adherence, poor attitude and poor management by the health

care professionals and patients were common cause of diabetic complication [11]. Permanent disability caused a loss of 12,699,087 years and over \$50 billion, and temporary disability caused a loss of 136,701 years in the working population and over \$763 million in Latin America and the Caribbean countries [7]. In Iran, complications also accounted 48.9% of direct cost [10].

In most African countries, diabetic patients' lives with many complications incurring higher average monthly out of pocket expenses due to long term treatment duration [12], as complications require more laboratory investigations, hospitalization and multiple therapies [13]. In Ethiopia this problems are increasing for the last two to three decades and becoming a major economic factor as this made diabetes patients to be dropped out of treatment [3]. Access to care may also contribute for poor prognosis for people with diabetes

### Objective

To assess the direct cost of illness of diabetic mellitus treatment in Dessie Referral Hospital.

### Method

Cross-sectional study was conducted on 217 participants from November 30, 2016 to December 31, 2017, and data were extracted from patients registries and analyzed using SPSS version 20. Linear regression was used to assess the statistically significant difference in the cost of treatment of diabetes. The study calculated direct medical and non- medical costs by multiplying the quantity of each service by their respective unit costs. The present study only assessed the direct cost such as cost of drugs, transportation, laboratory test, personnel cost and cost of glucose meter. Costs were obtained from the pharmacy department of the hospital and the cost per defined daily dose were calculated taking duration of therapy into consideration to obtain total cost of drugs and the laboratory test costs also obtained from the laboratory of hospital. Service fee for transportation was obtained from South Wollo zone transport authority and transportation cost was determined by multiplying the number of trip by the respective cost. Personal

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and accommodation costs were based on patient report. The total medical cost includes direct cost incurred for hospitalization, outpatient visit and out of pocket expenditures.

The data were entered and analyzed using statistical package for social science (SPSS) version 20 and Microsoft Excel 2007 and the results were presented in the form of tables and graphs. Linear regression was used to assess the statistically significant difference in the cost of treatment of diabetes and variable with  $p$ -value  $< 0.05$  were taken as statistically significant. The study calculated direct medical costs and non-medical by multiplying the quantity of each service by their respective unit costs.

#### Results

The total direct medical and non-medical costs per year were 12721.5 USD where 86.5% was direct medical cost and 13.5% was direct non-medical cost. Total cost of oral anti-hyperglycemic agents was 1934.68 USD while the cost of illness of diabetic patients on insulin and syringes was 2962.6 USD and 751.16 USD respectively. Age, complication and comorbidity had a statistically significant ( $p < 0.05$ ) effect on cost of illness.

#### Conclusion

Diabetes mellitus was an expensive illness and the direct medical costs constituted major segment in the treatment of illness, and treatment with insulin costs 1.5 times higher as compared with oral hypoglycemic agents. Diabetes mellitus cost burden has been accelerated due to its complications by 1.6. In view of the increasing global prevalence of diabetes, information from cost-of-illness studies should be used to increase awareness and for allocation of resources. Awareness of economic burden drives the urgent need for increased investments in the prevention and management of diabetes.

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