



Section Editors: Agnes Benedict and Soraya Azmi

**In our “From the Journals” section, we highlight an article from a recently published issue of either *Value in Health* or *Value in Health Regional Issues* that we hope you find informative as well as relevant.**

### **Value in Health Regional Issues May 2019**

#### **ECONOMIC EVALUATION**

#### **Assessing the Burden of Type 2 Diabetes in China Considering the Current Status Quo Management and Implications of Improved Management Using a Modeling Approach**

Volker Foos, Ke Wang, Phil McEwan, Yanlei Zhang, Ping Xin, Xiaohua Jiang, Shuli Qu, Tengbin Xiong, Raf De Moor, Mafalda Ramos, Mark Lamotte, Linong Ji

Patterns of diabetes in the world have changed over the past few decades. While it used to be mainly a “disease of affluence,” diabetes is now increasing among the poor.<sup>1</sup> Today, at a global level, 4 out of 5 people with diabetes now live in low- and middle-income countries, and the highest prevalence rates (>20%) appear to be in island nations such as the Marshall Islands and Tuvalu, followed by such countries as Saudi Arabia, Egypt, and Malaysia with age-adjusted prevalence rates in the mid-to high teens.<sup>2</sup>

Other middle-income developing countries with a burgeoning middle class are in a close race to catch up to the leading nations in this category. Like other countries experiencing rapid economic growth in recent decades, such as Mexico and India, China has a surprisingly high age-adjusted prevalence rate of 9.7%. To

provide some context, the age-adjusted prevalence rates in developed countries are 10.8% in the United States, 8.3% in Germany, and 4.8% in France.<sup>3,4</sup> Studying and predicting the impact of diabetes in any developing country is formidable due to still-limited health data resources. Bearing in mind that China is geographically vast with variations in healthcare administration systems in each jurisdiction, access to consistent and detailed data would be challenging. This study by Foos et al set out with the objective to estimate the economic burden of diabetes in China to reflect the status quo (SQ) of diabetes management. And secondarily, to estimate changes in cost if hypothetical enhancements in management were made to optimize type 2 diabetes (T2D) management.

The authors utilized the IQVIA CORE Diabetes Model as a basis for the study while data to populate the model were collected through pragmatic literature reviews using Pubmed as well as Chinese literature databases. Data that were not adequate to inform the model were supplemented by interviews with local experts. Data were collected on population characteristics (based cohort divided into 3 age categories: aged ≤45 years, between 46- 64 years, and >65 years), healthcare costs to treat diabetes and its complications, treatment modalities regarding choice of glucose-lowering agents, long-term progression of HbA1c, and current standards of T2D management to determine the status quo. Direct medical costs were considered by the authors as the sum of costs of complications and treatment. Because there would be a proportion of undiagnosed patients, the authors assumed that access to healthcare and costs were the same as those in the diagnosed population. Costs of complications were based on applying current and follow-up costs depending on the medical event occurring during model simulation. Treatment costs were calculated by summation of glucose-lowering medication and cardiovascular (CV) medication costs. These were on the

basis of unit cost of the most commonly prescribed pack type and daily dose. As to indirect costs, productivity losses were also obtained from literature.

The authors considered 4 different treatment paradigms to create the cost burden of the current status quo and then subsequently imposed 15 different improvement scenarios where the current management regime is improved upon. The 4 treatment paradigms relevant to the treatment of diabetes used in the study were based on a national survey of physicians as well as a patient survey. These 4 paradigms were delay in treatment onset, HbA1c threshold at which treatment is escalated, adherence rate, and cardiovascular risk factor management.

The results of the study showed that the estimated cost of diabetes with status quo management was RMB 621 billion (approximately USD 90 billion). In comparison, if various steps were put in place as modelled by the 15 different scenarios in univariate analysis, this could result in net savings varying from between RMB 19 billion to RMB 106 billion. The annual unchanged cost related to the population that remains undiagnosed and untreated was estimated at RMB 1,122 billion. In terms of indirect costs related to productivity losses, status quo was estimated to cost RMB 173 billion while the best-case scenario would reduce this to RMB 149 billion. As an aside, it is important to recall here that indirect costs are what would be borne by society in general, ie, patients, their families, and communities. In terms of life expectancy, the best-case scenario compared to status quo found life expectancy increased by 3.21 years in the total population. The authors acknowledge that the net savings even at its maximal estimate seem modest (RMB 160 billion), and this is essentially due to the costs of better diabetes disease management. Modest savings notwithstanding, the study results help to reinforce and support decision makers in implementing policies and practices that result in optimized care.

There were several study limitations. Among these were the use of expert opinion due to lack of data (for instance, to identify the treatment escalation threshold of 9%) and the use of equations from the UKPDS to assess the risk of CV complications. Expert opinion was also used for baseline population characteristics in diabetes complication rates. However, it is worth bearing in mind that the study's primary objective was to estimate the economic burden of diabetes in China. Hence, despite the study limitations, the study was commendable in its effort to attempt to quantify economic cost where no direct financial data is available.

The reader may wonder, why should I care about the modelled cost or cost savings of better treatment in China? In response, consider that diabetes is a devastating chronic disease that, if not

managed well, can wreak havoc on any healthcare system and change the way it substantially has to budget and plan for the future. This is important to bear in mind in any place where diabetes is still new but on the rise due to increase due to changing lifestyles and diet. On the individual level, it can impact patients' lives both personally and financially, which in turn impacts personal well-being. While diabetes prevalence rates in China are still in the low-to-medium range (compared to several other countries), these could continue to climb if not kept in check. Understanding the impact on cost and future budgets can spur better planning for preventive and management strategies. There are many other low- to middle-income countries faced with increasing diabetes where cost data are lacking. Therefore, ascertaining the national cost of diabetes, or cost for a region or state,

can seem an insurmountable challenge to researchers in places with such limited data availability. This study provides a helpful path forward for decision makers or researchers to obtain similar estimates of cost burden and savings in their jurisdictions. •

#### REFERENCES

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