Indirect costs associated with Diabetic Macular Edema (DME) in Colombia

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Introduction

Diabetic Macular Edema (DME) is a common microvascular complication of diabetes and is one of the leading causes of vision loss in these patients, as it results from elevated blood glucose levels that damage the blood vessels in the retina. DME affects 3.8% of American adults aged 40 and older who have diabetes [1].

From the Barometer Program, a global survey was conducted targeting patients, providers, and clinical staff regarding the treatment of DME, analyzing patients' perspectives on treatment adherence, presenting sociodemographic data of the participants, and identifying the main challenges and opportunities to improve adherence. Additionally, aspects such as the effectiveness of current treatments and unmet needs in the management of these diseases were evaluated.

The survey conducted for the estimation of Diabetic Macular Edema (DME), titled 'Market Research Survey focusing on the management and treatment of diabetic retinopathy (DR) - with and without diabetic macular edema (DME),' aimed primarily to provide a comprehensive view of the challenges arising from patient non-adherence to prescribed treatments. Additionally, it allows for an understanding of perceptions regarding the treatment experience of both patients with this condition and the clinics, healthcare staff, and providers responsible for care.

The study was conducted globally in 24 countries, resulting in a report with specific findings for Colombia, where the survey was applied in five ophthalmology clinics. In these clinics, four printed optical recognition questionnaires were used, designed to gather information on the perceptions and opinions of the following groups: [2]

- Patients currently receiving anti-VEGF therapy for the treatment of DME.
- Healthcare professionals (or providers) who prescribe and/or administer anti-VEGF injections in the treatment of DME.
- Staff members of any kind in the participating clinics who, although they do not prescribe or administer anti-VEGF injections for the treatment of DME, regularly interact with patients in other ways.

Within the survey, a total of 41 out of the 146 questions posed are specifically directed at patients with DME.

Objetive

To calculate the indirect costs associated with DME over a period of 2 years (2022 to 2023), based on data from the survey 'Market Research Survey focusing on the management and treatment of diabetic retinopathy (DR) - with and without diabetic macular edema (DME)' conducted globally, in which Colombia was a participating country.

Methods & Results

A total of 325 patients were surveyed in Colombia. The estimation was made in terms of productivity loss calculated from the time spent on transportation and healthcare attention, including medical appointments, administration of anti-VEGF therapies, laser treatments, and corticosteroids with/without caregiver, adjusted for the patient's age.

The sociodemographic data collected in the survey provide relevant information about patients affected by DME, such as age, gender, and place of residence. In Panel 1, the distribution of patients among these variables can be observed together.

Panel 1. Sociodemographic Information of Surveyed Patients

Figure 1. Ages of patients with DME

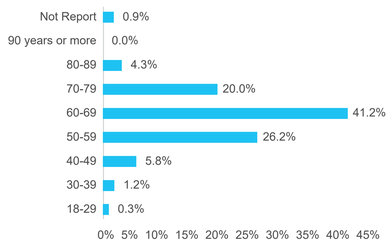


Figure 2. Gender of patients with DME

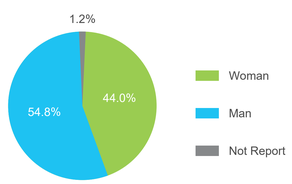
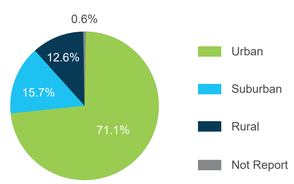


Figure 3. Place of residence of patients with DME



The analysis of indirect costs was conducted in the context of economic evaluations, understanding these costs as those associated with the loss or reduction of labor productivity caused by a health condition. Indirect costs are not related to the health production process (expenses on consultations, medications, or others), but they are linked to changes in the individual's productive capacity, primarily related to the loss of workdays due to time spent on treatment [3].

The Integrated Household Survey (GEIH) was used to calculate an average monthly salary for the economic activity related to caregiving and average monthly salary.

Indirect costs due to productivity losses were calculated for patients under 60 years old (33,5%) affected by Diabetic Macular Edema (DME), under the assumption that this population is in the active working age. To weigh the loss of productivity, the disability weight published by the World Health Organization was used for the health state of 'severe distance vision impairment' (DW = 0.314), which implies 'difficulty in daily activities, some emotional impact (e.g., worry), and some difficulty leaving home without assistance (4)

$$PProd = (Q_{Total\ patients} * \%Patients_{<60\ years}) * (Salary_{month/patient} * 12) * Ponderador\ GHE)$$

For caregivers, to estimate the economic impact associated with labor absenteeism due to the time that caregivers stop investing in their paid economic activities and dedicate it to accompanying patients to their therapy and monitoring appointment caregivers.

$$IncomeSalary_{caregiver}$$

$$= [((Q_{caregivers} * \%pat_{therapyx} * \%pat_{<6hrs}) * Q_{appointments} * Q_{hours1} * Salary_{hours/caregiver})]$$

$$+ [((Q_{caregivers} * \%pat_{therapyx} * \%pat_{<6hrs}) * Q_{appointments} * Q_{hours2} * Salary_{hours/caregiver})]$$

Transportation costs were also considered within the indirect costs, as this is an expense incurred by the patient due to their medical condition and is not related to the health production process. These were defined as the costs associated with the number of times per year that the patient and their companion must travel to the clinics where they receive treatment for the application of different therapies or monitoring appointments.

Transportation costs of patient

$$CT_{patients}$$

$$= [(Q_{pat} * \%pat_{therapyx} * \%pat_{<6hrs}) * (Q_{appointments} * (costsTray_1 * 2))]$$

$$= [(Q_{pat} * \%pat_{therapyx} * \%pat_{>6hrs}) * (Q_{appointments} * (costsTray_2 * 2))]$$

Transportation costs of caregiver

$$CT_{caregiver}$$

$$= [(Q_{caregivers} * \%pat_{therapyx} * \%pat_{<6hrs}) * (Q_{appointments} * (costsTray_1 * 2))]$$

$$+ [(Q_{caregivers} * \%pat_{therapyx} * \%pat_{>6hrs}) * (Q_{appointments} * (costsTray_2 * 2))]$$

It should be additionally considered in these calculations that the transportation costs should be multiplied by two, as it would account for the round trips of both the patient and the companion. On the other hand, the annual dose corresponds to the total treatment for one year; therefore, the calculations made correspond to the total annual value. For the calculation of the costs for year 2, the transportation costs adjusted for CPI and the frequencies of anti-VEGF therapy for year 2 were used in those cases where the number of consultations in the second year differed from the first.

Consumer price index (CPI)

Using an exchange rate of COP$4.061 Colombian pesos per US dollar (USD), the indirect costs results presented in the following table correspond to the total by costs category for the two years of study (2022 – 2023), at 2024 prices for patients plus caregivers

Table 1. Indirect costs results by category

Costs	Values (USD$) to prices 2024 n=325	Values (USD$) by person to prices 2024
Transportation costs	$ 225.490	$346,91
Total Unreceived Income	$ 41.415	$142,32
Total Productivity Losses	$ 325.130	$2.986
Total Indirect costs	**$592.034**	**$3.694**

Conclusions

Indirect costs of DME for the patient/caregiver in a two-year period was USD$1,822. The increase in these indirect costs is related to the frequency of the treatment, highlighting the benefit that a treatment scheme such as the treat and extent could provide in terms of reduction of these costs.

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Pat: Patients I Care: Caregiver I Pond: Ponderator I CT: Trasnportation Costs I PProd: Lose of productivity I Q: Quantity

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