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EDITORIAL

Diabetes mellitus 2 in Mexico: challenge for the health system

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Diabetes mellitus 2 (DM2), the most common form of the disease (90%), is one of the main causes of morbidity, disability, and death in Mexico and in the world. By 2021, the International Diabetes Federation[1] estimated that there were 537 million adults aged 20-79 with the disease, which by 2030 would reach 643 million, and by 2045, 783 million. It is estimated that three out of four adults with T2D live in low- and middle-income countries.

As a cause of disease in Mexico, in 2022 it ranked eleventh, with almost half a million cases. The highest percentage was recorded in the 50-59 age group, followed by the 65 and older age group. Almost two-thirds of the cases (65.2%) were observed in people aged 50 years and older[2] (Table 1).

On the other hand, in terms of new cases, the incidence was higher in women than in men, and the highest figure was recorded in the 60-64 age group (Fig. 1).

Regarding its prevalence, The *Encuesta Nacional de Salud y Nutrición* (ENSANUT) 2022 reported that 22.1% of the population had pre-diabetes and that this was more frequent in the groups with the lowest education and socioeconomic level. In turn, the prevalence of diabetes already diagnosed was 12.8% and that of undiagnosed diabetes was 5.8%[3].

Diabetes mellitus ranked second as a cause of death in Mexico in 2023, both globally and by sex. The disease is among the top 10 causes of death from the age of 25. By sex, 50.6% of deaths corresponded to women and 49.4% to men. By age group, it was observed that those aged 65 and over had the highest frequency of deaths. Of the deaths due to diabetes mellitus, 75.9% corresponded to non-insulin-dependent cases and 2.8% to insulin-dependent diabetes mellitus. The highest mortality rates per 100,000 inhabitants (adjusted for age) were recorded in Tabasco (123.3), Puebla (111.2), and Veracruz de Ignacio de la Llave (109.0), whereas the lowest corresponded to Sinaloa, Sonora, and Baja California Sur, with figures of 48.3, 52.8, and 56.1, respectively[4].

With respect to the importance of DM2, it stands out, in addition to the fact that it leads to death, that it is associated with the development of cardiovascular disease, cerebrovascular disease, kidney disease, blindness, and amputations of lower limbs, which is why it is the main cause of disability in the country[3]. Any of these complications individually, and often in combination, represent an enormous challenge for the affected people, their families, and the health system for daily life. In addition, the limitations they impose on work and social activities, in general, as well as the expenses involved in the consumption of medications, and replacement therapies (for example, of kidney function or the use of prostheses). Without the support of the social security system, out-of-pocket spending is unpayable in the medium or short term, depending on the personal situation. ENSANUT 2022 reported that 21.4% of people with pre-diabetes were not entitled to social security, whereas this occurred with 13.5% of people with diabetes, highlighting that 40.7% had no previous diagnosis.

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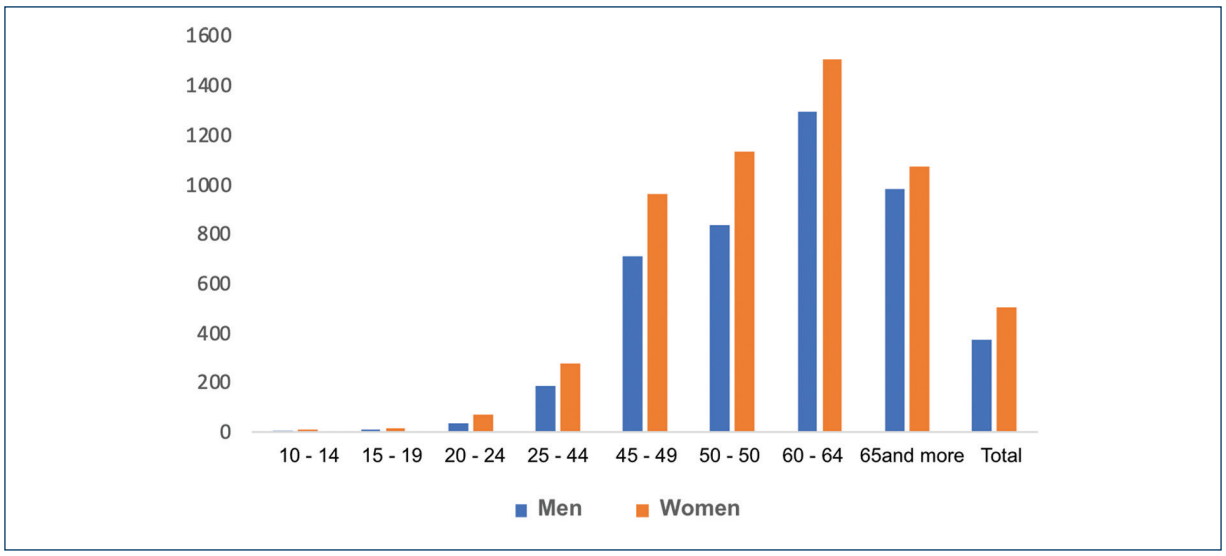

Figure 1. Incidence* of diabetes mellitus 2 by age group and sex. Mexico 2022.
*Rate/100,000 persons in the relevant age group (*prepared by the authors based on the Morbidity Yearbook: https://epidemiologia.salud.gob.mx/anuario/2022/principales/nacional/grupo_edad.pdf.*)

Table 1. Cases of diabetes mellitus 2 by age group in Mexico 2022

Age group (years)	No. of cases	%
10 and 14	694	0.1
15 and 19	1308	0.3
20 and 24	5567	1.2
25 and 44	89754	18.8
45 and 49	67559	14.2
50 and 59	132072	27.7
60 and 64	70663	14.8
65 year más	108408	22.7
Se ignora	575	0.1
Total	476600	100.0

Morbidity Yearbook: https://epidemiologia.salud.gob.mx/anuario/2022/principales/nacional/grupo_edad.pdf

The Pan American Health Organization's analysis of the burden of disease caused by DM2 in the Region of the Americas for 2019 reported that Mexico ranked second in mortality, third in years of life lost due to premature deaths, and seventh in years lived with disability[5].

Although progress has been made in the knowledge of the pathophysiology of the disease, more pharmacological groups have been developed for the management of hyperglycemia, and a greater variety of types of insulin are available, the truth is that the problem is far from being controlled. This suggests that the approach based on the care of existing cases does not give the expected results, since there is no cure, and metabolic control is not adequate. Although the patterns of consumption of food and beverages, as well as the performance of physical activity, are very important intermediate determinants in the genesis of overweight and obesity, as triggers of DM2, intervention strategies must be oriented to the structural determinants of the problem.

Public health policies represent one of the most relevant tools in this regard, to exercise effective control over the supply and distribution of healthy foods and restrict the marketing of ultra-processed products, which, in addition to having little or no nutritional value, are dense in energy, contain high concentrations of salt and trans fats. They constitute another risk due to the diversity of additives that are added to them, whose effects are observed, for example, in directly producing insulin resistance and affecting the composition and diversity of the intestinal microbiota, which metabolically regulates the absorption of nutrients.

The educational component of health promotion must comply with the incorporation or reinforcement of knowledge, attitudes, and behaviors with the conviction of its usefulness in health care, and not be limited to providing information, leaving the responsibility to the

population to carry out the recommendations proposed, since, in this way, people are blamed for their health situation, by not complying with what is prescribed.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality, informed consent, and ethical approval. The study does not involve patient personal data nor requires ethical approval. The SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript.

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