

Tackling Mexico's Health Burden: How can we reduce incidence and burden of non-communicable diseases?

by Mónica Guadarrama Serrano

Executive Summary

Mexico faces a significant burden from non-communicable diseases (NCDs), particularly ischemic heart disease and diabetes mellitus, which remain leading causes of death. High obesity rates, dietary risks, and inadequate healthcare access exacerbate this issue, along with social inequalities. Despite national efforts, Mexico's segmented health system and limited infrastructure continue to pose challenges in prevention and management. Existing policies have helped to contain the NCD epidemic but have not significantly reduced its prevalence. This policy brief includes new evidence-based policy recommendations based on Mexico's epidemiological landscape and systematic reviews: (1) Supermarket layout interventions – Promoting healthier food choices by modifying product placements and providing consumer health information. (2) Culturally adapted interventions for indigenous groups – Integrating traditional knowledge and community-led health strategies. (3) Telemedicine integration – Enhancing remote healthcare services to improve disease management and prevention. Implementing these strategies can strengthen Mexico's response to NCDs and reduce their incidence and burden.



Where are we standing? – Mexican Health System

“Mexico represents an epidemiological melting pot, as it experiences diseases typically found in industrialized countries alongside those prevalent in developing nations” (Sandoval- Gutiérrez, 2020).

Despite its classification as an upper-middle-income country and high ranking in Human Development Index (77/191), **income inequality and poverty** are **persistent health challenges** (Balandrán et al., 2021; United Nations, 2024; World Bank, 2023). As only 6.08% of its GDP is allocated to healthcare, makes Mexico as the country with **lowest expenditure** among all countries in the Organization for Economic Co-operation and Development (OECD, 2022). Additionally, although **life expectancy** in Mexico increased rapidly over the last century, it has remained at nearly 75 years for the last 10 years, **lower than in most other OECD countries** (Balandrán et al., 2021).

While the three main components of the Mexican health system (employment based social insurance scheme, public assistance services for the uninsured, and a private sector composed of diverse providers) operate in parallel to provide care with enough capacity; public health care providers face problems such as long waiting times, lack of trust and the unavailability of medicines (Balandrán et al., 2021). This results in **huge out-of-pocket spending** that continue to be a major source of financing, which leads to major health **socioeconomic health inequalities** (Balandrán et al., 2021).

The **COVID-19** pandemic brought to a crisis point the economic, social and health policy limitations that have affected Mexico for decades, Mexican health system came to **critical capacity** and will need time

to recover along with policies and efforts to eventually eliminate the segmentation between its components to ensure universal care (Balandrán et al., 2021).

Health System Metrics (WHO)



1 hospital bed per 1000 population (2021)



2.69 nurses per 1000 population (2021)



2.61 doctors per 1000 population (2021)



6.08 % current health expenditure as percentage of GDP (2021)



41.4% out-of-pocket health expenditure (2021).

Remaining Issues:

- » **High institutional segmentation**
- » **High inequity to access health**
- » **Limited infrastructure capacity**
- » **Health system recovery from COVID-19**

Burden of Disease in Mexico

The Global Burden of Disease Project identifies that most deaths in Mexico in the year 2021 were caused by:

- 1. COVID- 19
- 2. Ischemic heart disease
- 3. Diabetes
- 4. Chronic Kidney Disease
- 5. Cirrhosis Liver

As seen in Figure 1. four out of the top five leading causes of death in Mexico are **non-communicable diseases (NCDs)**. Between 2011 and 2021, excluding COVID-19, ischemic heart disease, diabetes, and chronic kidney disease remained consistent leading causes of death (IHME, 2021).

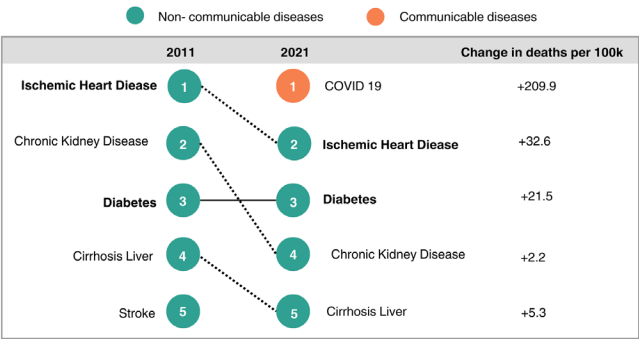


Figure 1. Top 5 causes of deaths per 100k in 2021 and rate change 2011–2021, all ages combined (IHME, 2021)

In 2021, ischemic heart disease had a mortality rate of 112.6 per 100.000 population, affecting more males compared to females (130 . 3> 95.2) (WHO, 2024). In the same year, diabetes mellitus had a mortality rate of 71.4 per 100.000 population, affecting as well more males compared to females(73.4.3>69.2)(WHO,2024).

“One DALY (disability-adjusted life year) represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost to due to premature mortality and the years lived with a disability due to prevalent cases of the disease or health condition in a population” (WHO. 2020)

As seen in Figure 2, when considering the combination of both **mortality and DALYs**, ischemic heart disease has the largest incremental percentage between 2011 and 2021 with a value of 65%, followed by diabetes with an incremental percentage of 56% (IHME,2025).

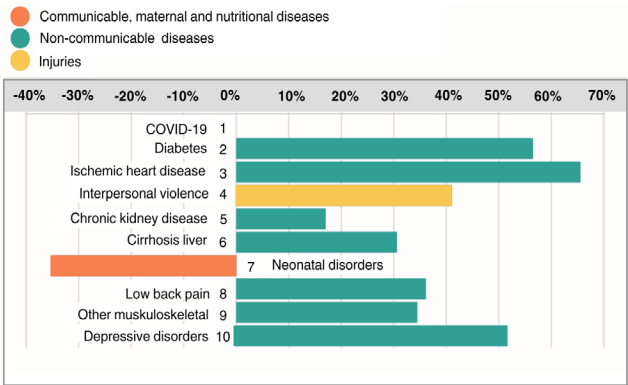


Figure 2. Top 10 causes of death and disability (DALYs) in 2021 and percent change 2011–2021, all ages combined (IHME, 2021)

Risk Factors contributing to most deaths and DALYs (IHME, 2021):



High Fasting Plasma Glucose



High Body-Mass Index



Dietary Risks



Kidney Dysfunction



High Blood Pressure

Most of these risk factors are associated with obesity, which is a very significant health concern in the country. Mexico ranks second highest in the world in overall prevalence of **obesity** (only behind United States), and highest in the world for overweight and obese children (Balandrán et al., 2021).

73.4% of the 15+ years population in Mexico are overweight or obese (PAHO, 2024).

The Big Question: What's next?

As seen in the Global Burden of Disease project statistical insights, one of the main epidemiological challenges Mexico faces is tackling NCDs. To understand what can be done to tackle the burden of disease, an analysis of the past and present and research for a possible the future of Mexico surrounding these diseases is done.

This policy brief aims to explore the epidemiological landscape, some existing policies and interventions and provide new evidence-based policy recommendations to reduce the incidence and deaths caused by cardiometabolic diseases, specifically ischemic heart disease and diabetes mellitus.

Methodological Approach

For the first part of this policy brief, the documentation used stem from (3) books from the Mexican Public Health Institute (INSP), (2) documents from the Mexican Ministry of Health, (2) documents from Mexican Normative and (2) UN documents, along with (3) systematic reviews of **Randomized Control Trials** (RCT) and (3) repeated cross-sectional studies. These sources bring context of the epidemiological landscape and policies on the discussed diseases. For the second part of the brief on developing evidence-based policy recommendations, (6) systematic reviews of RCTs were considered, as well as (1) scoping review and (1) RCT cost-effective analysis study. Various electronic databases were searched: INSP database, PubMed, Google Scholar and Cochrane.

RCTs are studies that measure the effectiveness of an intervention or treatment. Participants are recruited and randomly assigned to either the intervention or the comparator group and then compared. RCTs are the gold-standard for studying causal relationships (Hariton and Locascio, 2018)

Limitations:

- Some of the captured data is outdated several years, while its relevance still prevails, it can lead to inaccurate and biased conclusions.
- While most of literature is based in the context of Mexico, Latin American and Caribbean

population or low- and middle-income countries, two systematic reviews mainly address RCTs in high income countries, which is accounted in the evidence-based policy recommendation.

Epidemiological Landscape

Ischemic Heart Disease in Mexico

Since 1950, Mexico had an **epidemiological shift** caused by a huge **industrialization transition**, changing the leading causes of death from communicable to non-communicable diseases . (Soto-Estrada et al., 2016). Cardiovascular diseases, specifically ischemic heart disease, have played an important role at the top of that list ever since. A survey conducted to patients registered in the employment based social insurance estimated that more than half of the subjects in reproductive age have **at least 1 cardiovascular factor**. (Acosta-Cázares and Escobedo-de la Peña, 2010). Among these, the most mentioned were diabetes, hypertension, high blood cholesterol, obesity and smoking. These factors are present similarly in men and women, excepting smoking that is more common in men than in women. (Acosta-Cázares and Escobedo-de la Peña, 2010).

Annual costs of cardiovascular diseases care significantly exceed health expenditure per capita in most low and middle income countries, raising the issues of financial protection for patients. (Gheorghe et al., 2018)

In 2006, Mexico spent 7% of the health expenses on

cardiovascular diseases and diabetes mellitus, which was 0.4 of the national GDP, which is similar to the actual health expenditure. (González-Domínguez et al., 2006; WHO, 2024) From this budget, 73.5% was designated to therapeutic care and 2.7% to preventive service; 55.2% of these went directly to tackle cardiovascular diseases were adults aged 60 or older, especially **women**, represented much **more expenses** (González-Domínguez et al., 2006).



Hospitalization services are the most expensive and represent 23% of the providers' expenditures (González-Domínguez et al., 2006). Hospital readmissions are common and represent a burden on health care systems, some are preventable and partly attributed **to poor adherence to heart failure guidelines**, particularly in Latin America (Ciapponi et al., 2016).

From in-hospital mortality rates for heart failure-related diseases, Latin American patients with ischemic disease and Chagas-related disease show a poorer prognosis, with higher rates than those observed in other studies located in USA (Ciapponi et al., 2016).

Out of the preventive services for **prevention**, the expenses are distributed mainly in middle aged population in which **women spent 2.7 times more** money than their men counter parts.(González-Domínguez et al., 2006). Although health expenditures are the most in women population for both preventive and therapeutic care, there is still a misconception of the importance of cardiovascular diseases in women. Cardiovascular disease campaigns addressed

for women they do not get as much coverage as, for example, breast cancer. (Peix and Paez, 2019).

Diabetes Mellitus in Mexico

The epidemiological shift toward non-communicable diseases, driven by industrialization, affected in the same way the incidence and the deaths caused by diabetes mellitus (Soto-Estrada et al., 2016). A particularity of diabetes

Genetic variations associated with Indigenous ancestry have been linked to an increased risk of developing type 2 diabetes, which affects most of the Mexican population (Buichia-Sombra et al., 2020).

is that diverse studies have shown that not only dietary factors contribute to the high incidence of diabetes, but genetic components also play a role. However, ethnic groups from indigenous minorities are even more vulnerable as these groups also face major socioeconomic inequities, and limited access to healthcare, which increase the risk and severity of diabetes (Buichia-Sombra et al., 2020). Over the past 3 decades, healthcare coverage in Mexico has improved significantly. However, large disparities

remain between rural and urban areas, where a significant proportion of the Indigenous population resides (Carrillo-Balam et al., 2020). Even when insured, many individuals in these communities lack access to local healthcare services for screening for early diagnosis and complications, and timely intervention and prevention programs, key measures for reducing the incidence, morbidity, and mortality of diabetes (Carrillo-Balam et al., 2020).

From the previously mentioned percentage of 7% on health expenditure designated to cardiovascular diseases and diabetes mellitus with 73.5% designated to therapeutic care and 2.7% to preventive service in 2006; 40.6.% was focused on the diabetes, were

“Women frequently have atypical symptoms [...] as well as inequity in medical and interventional treatments; therefore, care should be built upon these differences” (Peix and Paez, 2019)

as well adults aged 60 or older, especially women represented more expenses being 1.5 times greater than men and as well 2.7 higher for preventive programs. (González-Domínguez et al., 2006) This imply the same conclusions for cardiovascular diseases, for the need of emphasizing on the importance of diabetes on women considering that the distribution of disease and death of diabetes is almost equivalent between sexes.



Existing Policies

In the last two decades, Mexican government had developed a series of policies and programs to prevent and manage cardiovascular diseases and diabetes, which involved promotion for behavioral change, health and education systems, beverage and tobacco industry and food industry. Some of them include:

Promotion of behavioral changes:

- Limit recommendation of sugary drinks consumption.
 - » Guidelines that **prioritize** potable water, low-fat milk, unsweetened coffee, and non-caloric beverages while limiting fruit juices, sports drinks, and whole milk, and avoiding sugary beverages with no nutritional value (Sánchez Romero et al., 2015)
- Adjustment of National Alimentary Guidelines 2023
 - » Adjusted guidelines adapted to Mexican

context for a balanced diet based on traditional foods, **promoting local and seasonal ingredients** while reducing ultra-processed foods, advocating for **sustainable food practices** as supporting environmentally friendly agricultural methods. (SSA et al., 2023).

Health and education systems:

- Prohibition of sale of unhealthy food in basic school level (starting in 29 March, 2025) (López, 2025)
- School program for obesity pre-diagnosis with a set of doable objectives for lower the incidence of obesity in schools (Barquera et al., 2007).
- Specific Action Plan for cardiometabolic diseases
 - » Designed a plan which they focus on punctual actions for management and prevention, such a **standardized instrument for screening population** of 20 years and older and follow up. (Gloria Hernández and Fernández Posada de la Mora, 2021).

Beverage and tobacco industry:

- 60% tax on tobacco products, added \$0.35 MXN per cigarette (INSP, 2020)
- 26% tax on beer and between 30-53% on distilled and fermented beverages (INSP, 2020).

Food Industry:

- 10% tax on sugary drinks (Sánchez Romero et al., 2015; SSA, 2020)
- Front label regulation with warnings for excess of calories, sugar, salt, saturated fats and trans fats (SSA, 2020)
- Regulation on advertising for kids
 - » Advertising not healthy products only on school schedule and prohibition of animated characters on labels (Sánchez Romero et al., 2015; SSA, 2020)

While these regulations have been useful for more conscious consumption, the incidence of cardiovascular diseases and diabetes associated with obesity and overweight are still high and have not been able to reduce it but contain it.

How can we improve? – New Policy Recommendations

Supermarket layout and point of purchase health promotion

Most of food purchasing decisions are made in supermarkets and an optimal intervention can influence this decisions by promoting healthier choices (Escaron et al., 2013).

Evidence suggests that placing **fruits and vegetables** in the entrance of stores improves the nutrition profile of stores, as **it increases by an important percentage the sales on this products** when the layout is changes (Vogel et al., 2021). Removing **confectionary** items from checkouts and aisle ends opposite also reduces its consumption, however with **smaller effects** (Vogel et al., 2021).

In Escaron et al. systematic review, is also revealed that between supermarket interventions, promotion and advertising in the point of purchase were the most common interventions with sufficient evidence for shifting to **healthier consumption** (Escaron et al., 2013). Measures included giving information guides in **printed materials**, change in shelf labeling and within **information booths** where testing and quick screenings were possible helped in increase the sales on healthier products (Escaron et al., 2013).

In Mexico, **domestic labor** is mostly made by women, as it is estimated that women 12 years

and older spend 3 times more the hours men spend on domestic labor (UN WOMEN, 2015). Supermarket interventions can be tackled especially from a **women's perspective**, as it is more likely for them to make the **purchasing decisions** for meal preparations for the family. Informative government brochures could include warning campaigns for **awareness** of cardiometabolic diseases that includes a particular focus on women.

While most of the studies have taken place in high income countries, measures can be culturally adapted to the Mexican context.



Key takeaway:

Creating a normative framework to standardize supermarket layouts and shelf labeling, as well as installing an information booth with printed guides and awareness brochures tailored mainly for women.

- **Fruits and vegetables in the entrance of stores**
- **Removing confectionary products from checkout points**
- **Information Booth with special focus to women**



Culturally appropriate campaigns for indigenous groups

Implementing culturally adequate interventions for indigenous groups by consulting, co-designing, recognizing and value the ownership of their knowledge result in better health outcomes and higher rates on adherence in diabetes management (Sampath et al., 2025).

Part of culturally adequate interventions is adapting the language, evidence suggests that health knowledge and outcomes were better when care was provided by a clinician who was from the same ethnicity and spoke the **same language** as the participants (Sampath et al., 2025). However, not only adapting the languages is important but also **involving indigenous community leaders** in the development and implementation of interventions (Kanmiki et al., 2025).

Evidence suggests that delivering **care and health literacy** information is more effective in **community safe spaces** and schools and combined both school-based and community-based strategies improves knowledge, behavior and service delivery for reducing cardiometabolic disease risk factors. (Kanmiki et al., 2025). Key strategies to deliver care and information involved the **incorporation of cultural and traditional activities**, storytelling and narrative language (Kanmiki et al., 2025)

Sampath et al. systematic review and Kanmiki et al. scoping review mostly consider Māori, Inuit and Native American indigenous groups, however, these

frameworks can be adapted into Mexican indigenous groups.

Key takeaway:

Adapting existing national nutrition, diabetes guidelines with the consultation of members from these communities having as a policy the mandatory need of a member of said indigenous group in the design and delivery of information and care.

- **Translating documentation to the most spoken indigenous languages in Mexico**
- **Involving community doctors and leaders in design and implementation**
- **Adding traditional cultural learning practices for management**
- **Having screening and intervention services in safe community places**



(Yorchlavadu 2022)



(Samkov, 2020)

Telemedicine Integration

Evidence suggests that, while face-to-face clinician contact might be considered crucial for the delivery of health care, when combined with remote monitoring, Telemedicine was associated with reduced cardiovascular mortality and hospitalization, as well as glycemic control in diabetic patients (Kuan et al., 2022; Marcolino et al., 2013).

The integration of telemedicine can help to facilitate follow-up and reach of health literacy for rural and underserved areas, as well as enhancing delivery capacity, however socioeconomic disadvantage and the age of the participants must be considered. In both systematic reviews consulted for this recommendation, two 3 main telemedicine approaches: telephone calls or videocalls, mobile apps or websites; all with or without monitoring device (Kuan et al., 2022; Marcolino et al., 2013). Evidence for both diabetes and cardiovascular disease older adults report greater anxiety about using computers, lower use of technology and less confidence in their technological abilities, which may mean is not appropriate for all patients (Marcolino et al., 2013).

However, two alternatives of telemedicine could be chosen: telephone consultation for follow up and advice, as well as websites and apps that promote health literacy and physical activity as well as follow-up can be applied. It has been proven that implementation of telemedicine interventions in Mexico, such as the Dulce Project, have shown cost effectiveness for managing diabetes. (Gilmer et al., 2019)



Key takeaway:

Integrating telemedicine approaches for targeting rural and underserved areas that can be reimbursed within the social insurance, private insurance or social assistance scheme.

- **Option to join two telemedicine approaches: telephone calls or app/ website**
- **Follow up services with telemonitoring**
- **Health literacy and physical activity promotion**





(Sorte 2025)

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