

Burden of chronic diseases in the Mexican Social Security Institute, 2010. Mexico

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Introduction

Mexico was one of the first countries to use the methodology proposed by WHO to estimate the burden of disease. The first estimate for the DALY indicator was made in 1994 by Murray and Lozano.¹ In the last decade, other studies were conducted in 2005 and 2009, highlighting the health situation of the Mexican population^{2,3,4,5}

In the Mexican Social Security Institute, estimates were made of the burden of disease of the eligible population, with 2000 information. The results showed a similarity in APMP and total life expectancy with countries that have better overall performance in health.⁶

In 2005 there were estimates of the burden of disease in the IMSS insured workers with information of 2001, which contributed to characterize the epidemiological profile of the health of this population⁷

In 2007 was published the results of the estimates of the burden of disease for 129 cases that could identify health priorities in each of Mexican states presenting comparative data between 1995 and 2000.⁸

The burden of noncommunicable diseases is increasing, representing nearly half of the global burden of disease in all ages, with an increase of 10% of the estimated levels in 1990. While the proportion of the burden of non-communicable diseases in developed regions remains stable at around 85% in adults aged 15 years and over, the proportion of disease burden in adults is now attributable to noncommunicable diseases. The aging of the population and changes in the distribution of risk factors have accelerated the epidemic of noncommunicable diseases in many developing countries.^{9,10,11,12,13}

The study led by the WHO Global Burden of Disease (GBD) 2003,¹³ showed that mental disorders occupied a major cause of disability, especially in low-and middle-income. Depression in this study was 3.7% of total DALYs. The GBD 2000, 14% estimated that neuropsychiatric disorders contributed about 14% of the disease burden and depression was ranked as the fourth leading cause worldwide. It is recognized however, that the poor quality of the data limits the validity and interpretation of these estimates.

Decision makers may divert your attention therefore to other public health priorities.¹⁵

The Global Report 2009 (WHO), it is mentioned that in 2004 Latin America and the Caribbean had the highest burden from noncommunicable diseases (62.1%), followed by communicable diseases (22.3%) and injuries (15.6%).¹⁶

The neurological and psychiatric diseases caused 20'914,000 DALYs (21.3% of total), without having a major impact on mortality (just 2% of total deaths).¹⁶

Burden disease studies of the in Latin American countries, highlights the major noncommunicable diseases as causes of mortality, ranging from 62% to 84%.^{17,18,19,20,21}

In Mexico, the national burden of disease is dominated by noncommunicable diseases and their risk factors, consistent with the framework of epidemiological and nutritional transition.^{22,23,24} For the period 2004-2007, depression, diabetes mellitus, cirrhosis, alcoholism, ischemic heart disease, are reported among the 10 leading causes of DALYs.⁴

Objectives

- Estimating the burden of noncommunicable diseases in the population covered by the Mexican Social Security Institute associated with premature death and disability, using Adjusted Life Years indicator Disability (DALYs) in 2010.
- Estimating Years of life lost (APMP), years lived with disability (YLD) and Years of Disability-adjusted life (DALYs) by sex and age group, for noncommunicable diseases in 2010.

Methodology

DALYs, measure the amount of damage that cause disease, allowing to establish their relative importance in a categorized listing of problems, its calculation requires determination of those parameters:

1. The duration of time lost due to premature death.
2. The social value of time lived at different ages.
3. The preference of time.
4. The measurement of non-fatal outcomes.

Thus, one DALY corresponds to one year of healthy life lost and measuring the burden of disease from this indicator mean the gap between current health status of a population and the ideal in which every member of the population could reaching old age free of disease and disability.

DALYs for a specific cause, are the sum of years of life lost due to premature death (APMP), specifically for that reason, plus the years of life lived with disability (YLD) for incident cases of the same specific cause

Measurement of non-fatal outcomes (disability)

It is the measurement of the time lived with disability in a common unit of measurement used for the time lost due to premature death. Requires the definition of a weighting of the severity of disability that allows years of life lost as a result of a disease and its aftermath are comparable to the years of life lost due to premature death. The weighting is obtained from an ad-hoc classification defined by experts on the basis of the ICIDH (International Classification of Impairments, Disabilities and Handicaps, WHO). In the study of disease burden was necessary to measure disability in the different conditions tested.

Estimation of overall mortality and life expectancy

Overall mortality in 2010, was obtained from population registers and deaths in the same period, published by the National Institute of Statistics, Geography and Informatics (INEGI). We considered only information of population of IMSS. The specific source of deaths is the database of deaths, while the population of census 2010.

Selecting the list of diseases

Health problems studied literature searches were conducted that would support the information necessary for the calculation of DALYs. Original catalog proposed by WHO following modifications were made according to the frequency of submission of the conditions:

1. Cancer of the nasopharynx and other cancers of the pharynx, were analyzed together with malignant tumors of the mouth.
2. Melanoma is analyzed in conjunction with malignant skin tumor.
3. Non-Hodgkin and Hodgkin were analyzed together.
4. Malignant tumors of the testis and thyroid were included in the group of other malignancies by its low frequency.
5. On the clustering of cardiovascular and circulatory diseases, hypertensive diseases were included.
6. Diabetes mellitus (DM) was analyzed separately, Type 1 and Type 2, each with its major complications.

Estimates of deaths from specific causes and correction of misclassification

For specific mortality by age and sex of the diseases studied, we used the database of deaths from INEGI, considering most comprehensive source for estimating this parameter.

Deaths identified by age and sex unknown, were reclassified in proportion to local, municipal, state or national, depending on frequency by age and sex.
Registration of deaths from INEGI, including the underlying cause of death, the fourth digit coded according to ICD-10.

Disease modeling by DISMOD II.

For the construction of behavioral models and distribution of diseases of interest (estimated DALYs, APMP and AVD) was used DISMOD II computer program, created to assess the internal consistency of epidemiological, distributed by WHO, which, from the initial values of incidence, prevalence, mortality, and remission for each disease-specific mortality and the burden of disability from diseases to analyze, generate a life table with multilevel competing risks without interaction between diseases, integrating, estimates consistently and without bias of each of the diseases

We created a data set that includes all diseases studied and adjusted mortality nationwide. After modeling each condition, we obtained the necessary parameters to calculate YLD by age group and sex. Because mortality was considered the most reliable parameter input, is used directly to calculate the APMP

Calculation of APMP, YLD and DALYs

By calculation procedures described in the methodology and with the support of the tools developed by WHO, was calculated for each of the conditions studied, the APMP, YLD and DALYs by age group and sex.

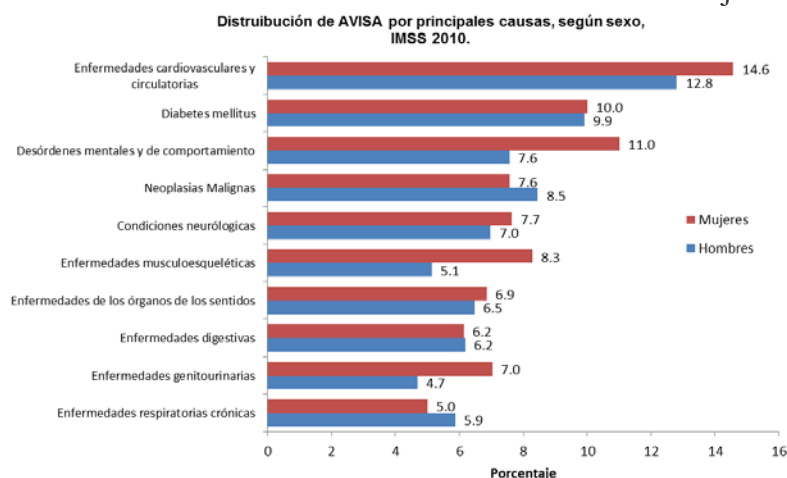
We used death registration for 2010 INEGI, tabulated for the mortality that form the basis of calculating the APMP and, indirectly, of the YLD

Results

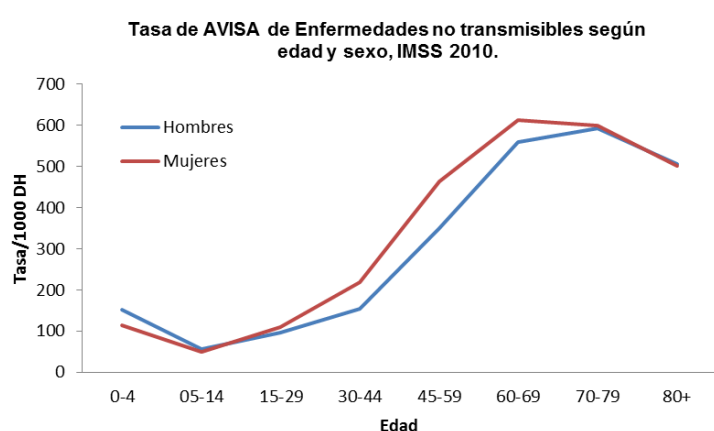
Mortality by cause group and subgroup

86.5% of DALYs are concentrated in the group of non-communicable diseases, led by cardiovascular disease and circulatory causing 13.76% of total DALYs, followed by 9.96% DM, the mental and behavioral disorders, 9.43%, malignancies with 7.97%, and neurological conditions with 6.68%, followed by musculoskeletal diseases, diseases of the sense organs, digestive diseases, genitourinary diseases and chronic respiratory diseases. The three main causes of death were cardiovascular and circulatory diseases, cancers and diabetes mellitus, with respect to the conditions that caused AVISA greater burden on the insured population were cardiovascular and circulatory diseases, which remained in first place, the DM moved into second place, followed by mental and behavioral disorders, which moved into the fourth position malignancies.

By sex for women, mental and behavioral disorders rose to second place with 11.01% and musculoskeletal diseases ranked fourth with 8.28, while in men, malignant neoplasms ranked third with 8.45% of DALYs and unintentional injuries reached fifth place with 7.4%



By group of causes, the load increases with increasing age, especially after age 30, which is related to the natural history of chronic and degenerative diseases.



By sex, women can be seen that the mental and behavioral disorders outweigh in importance to the DM, musculoskeletal diseases are located above and neurological conditions, malignancies move to sixth place.

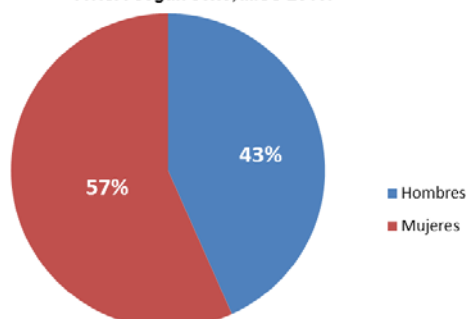
In men, maintaining the cardiovascular and circulatory diseases and diabetes mellitus in first and second place of DALYs, malignant neoplasms outweigh the mental and behavioral disorders, musculoskeletal diseases while traveling to the tenth.

Burden of disease by cause group

The burden of disease in the population covered by IMSS noncommunicable causes, was 11'010, 900 DALYs, corresponding to 86.5% of the total disease burden in 2010. The 83.7% was at the expense of disability (YLD) and 16.3% due to premature death (APMP).

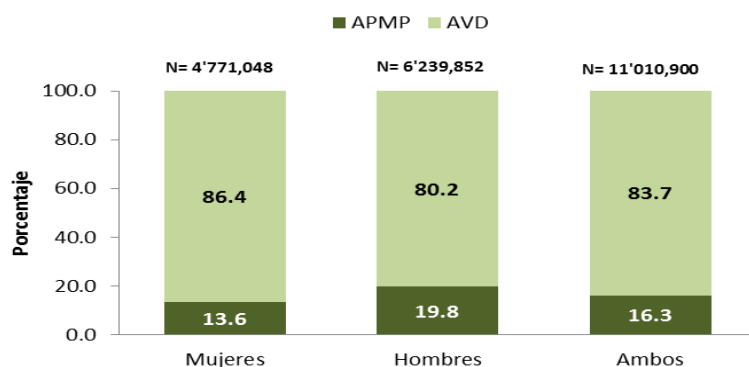
By sex, women have the greatest burden of these conditions with 6'239, 852 DALYs, while men accounted 4'771'044 DALY.

Enfermedades no transmisibles. Distribución porcentual de AVISA según sexo, IMSS 2010.



By sex, the proportion of ADL was slightly higher in women than in men, 86.4% vs 80.2%, respectively.

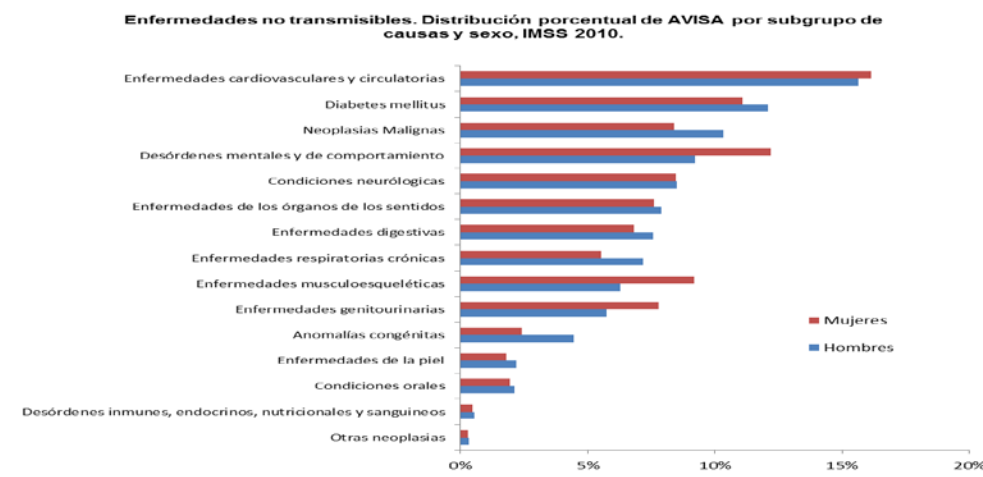
Enfermedades no transmisibles. Contribución relativa de APMP y AVD a los AVISA por sexo, IMSS 2010.



By subgroup of illness, cardiovascular diseases and circulatory were those that had the greatest contribution to DALYs (1'751, 406), followed by DM (1'267, 425) and thirdly by mental and behavioral disorders (1'200, 794). These three conditions, along with cancers and neurological conditions that occupy the fourth and fifth position, contributed to 46% of the burden of noncommunicable diseases. This is explained by the aging of the population.



By sex shows that cardiovascular and circulatory diseases ranked first in both men and women, however the DM in women is at the third place of importance, displaced by mental illness and behavior in men occupy the fourth position. Malignant neoplasms whereas men in third place in the women move to sixth.



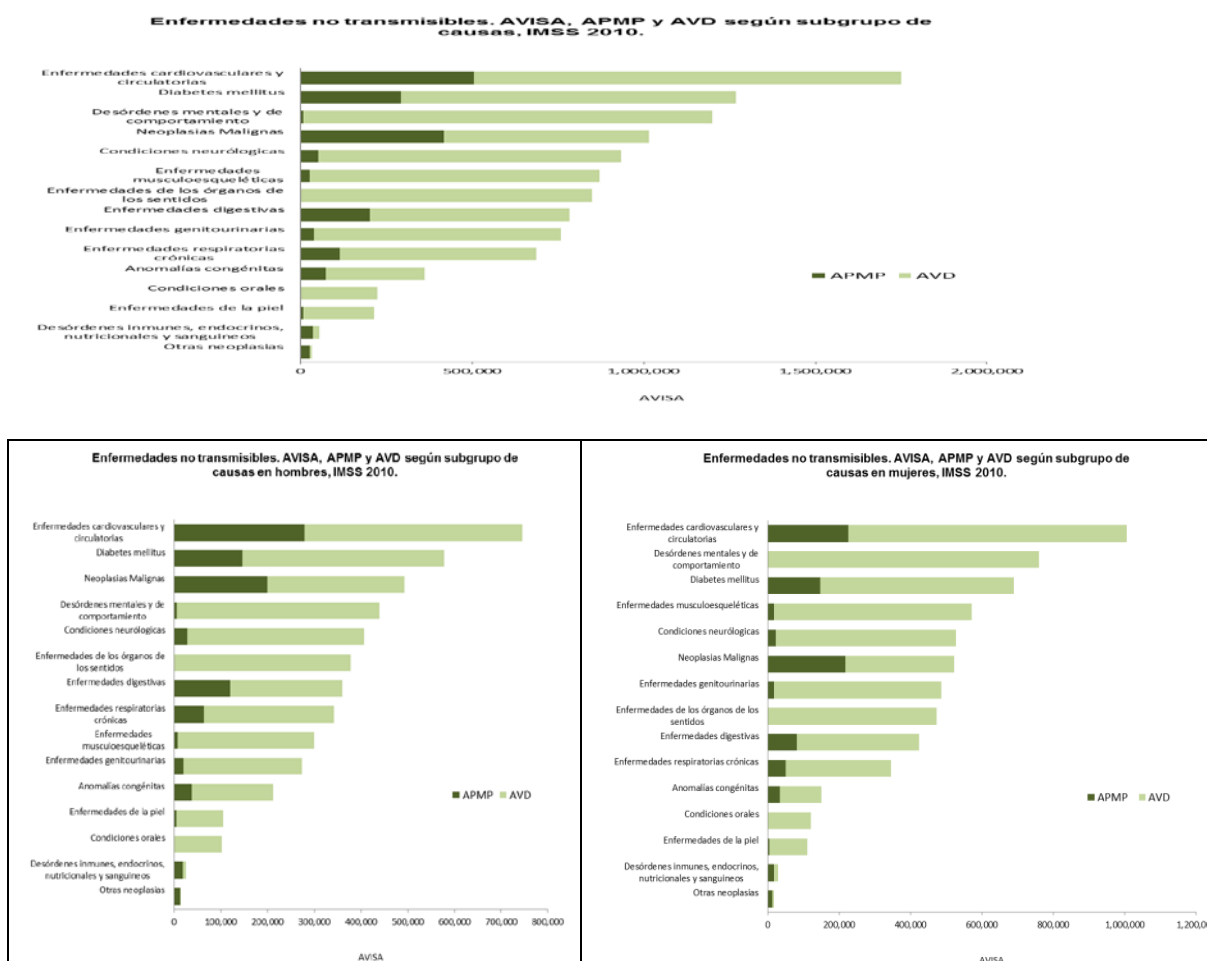
By age group and sex, reveals the following

Cardiovascular disease and cancer accounted for over 70% of DALYs. Both men and women over 45 years, cardiovascular and circulatory diseases account for more than half of DALYs.

Noncommunicable diseases increase in importance as age increases, it is generally observed that the greatest burden of disease is concentrated between 45 and 59 years, followed by the group of 30-44 years.

The contribution of APMP and AVD for each subgroup of chronic disease, it is observed that except for cardiovascular and circulatory diseases, malignant neoplasms, DM and digestive diseases, in which the contribution of premature death is important DALYs in

other subgroups of conditions, the burden of disease is mainly due to disability (YLD). This behavior is similar in women and men. In the following graphic you can see the distribution of ADL and APMP for subgroups of total causes and sex.



Discussion and conclusions

This study demonstrates that the national burden of disease in the IMSS is dominated by noncommunicable diseases, consistent with the epidemiological transition in our country.

In the reports of previous studies in six countries in Latin America (Brazil, Chile, Costa Rica, Colombia, Mexico and Peru), chronic diseases are among the leading causes of mortality, ranging from 62% in Costa Rica to 84% in Chile. The IMSS was 83% for 2010, similar behavior is observed in Brazil, Colombia, Costa Rica and Peru. With respect to the burden of disease in the six countries are among the ten leading causes of DALYs, CVD and DM, in our study occupied the top two positions in order of importance.

Chronic diseases have a greater burden because they last longer, they can even be life,

having effects that can be severe, such as DM and renal failure, if you add the increase in life expectancy there is greater exposure to risk factors that predispose to these diseases. Cardiovascular disease, cancer and DM were responsible for most of the burden of total mortality in men and women. In Chile (2004) CVD concentrated 51.1% of total DALYs, although the prevalence was a man unlike our study was in women (54.6% men and 47.5% women). The leading cause of DALYs accounted hypertensive disease (6.9%).

It is surprising that depressive disorders and anxiety have an important place in the group of women, so it is convenient to perform actions for the treatment and rehabilitation of these health problems.

It is important to consider the effect of preventive programs, so to perform evaluations of interventions, as PREVENIMSS or DIABETIMSS to evaluate that has been achieved over time that have implemented these programs, and assess its effectiveness in the treatment of chronic diseases.

In conclusion, this study highlights burden of disease conditions that in some way or another can surpass health services, and although there are some prevention programs, although these diseases are increasing, which demand more institutional resources both financial as humans, so it is important to strengthen health institutions such as the IMSS, and continue with studies that demonstrate these needs.

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