

# Socio-economic Stratification and Ill Health in Mexico

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## Abstract

As in other societies, socioeconomic inequality in Mexico is manifested in disparities in morbidity and mortality rates among the Mexican population. Individuals living under the most precarious socio-economic conditions display higher rates of child mortality and other health conditions that are often associated with poor economic development, such as malnutrition. Moreover, Mexicans from lower socio-economic levels also experience higher rates of weight gain, diabetes mellitus, hypertension, and depression. Individuals with fewer years of education use condoms less frequently, and are also less likely to be tested for HIV; this results in higher HIV infection rates. Social inequality in health is a phenomenon that adversely affects the lower socio-economic populations of Mexico. The reduction and eventual eradication of social inequality in health should be high on the public agenda. Although institutions working in the public health sector can have an impact on reducing health inequalities, fundamental solutions are more likely found within economic, employment, social, and food assistance policies.

**Keywords:** social inequality, poverty, health, illness, socio-economic stratification, socio-economic status, Mexico.

## Introduction

Within the field of public health, researchers have examined how socio-economic inequality and poverty are related to the distribution of health, illness, and access to health care. Mexican social medicine and collective health have developed theoretical approaches to understanding socio-economic inequalities in health and disease.<sup>1-3</sup> However, the

compilation of empirical evidence concerning socio-economic disparities in health remains limited.<sup>4-6</sup>

For example, in 1970, Celis and Nava compared the occupations of individuals receiving medical treatment at the General Hospital of Mexico with those treated in private clinics.<sup>4</sup> Their research demonstrated that individuals seen at the public hospital were on average younger (possibly reflecting a lower survival rate) and that their disease was more advanced prior to receiving first medical treatment. Although this study documents health inequalities, it does not meet the methodological rigor of an epidemiological study. In the 1970's and 1980's several authors<sup>1,3,7</sup> identified the need to demonstrate the existence of socio-economic health inequalities in Mexico. Nevertheless, at that time the empirical evidence that was available (and used) came from official statistics on general morbidity and mortality rates. This means they provided averages for the Mexican population as a whole without distinguishing between social level or class. In 1980, Lopez noted that *"there have been few studies conducted in Mexico that have investigated the social causality of disease and identified its specific differential distribution among the social classes."*<sup>7 (Pages 40-1)</sup> Consequently, the aim of this study is to document the relationship between socio-economic stratification and poverty with the distribution of health and disease in the Mexican population.

It is common within public health to use the theories of "epidemiological transition" and "lifestyle factors" to explain the common health problems.<sup>8</sup> Both theories have dominated thinking in both government circles as well as academic forums related to public health. The epidemiological transition theory asserts that industrialization and urbanization promote chronic non-communicable diseases, which displace infectious diseases as leading causes of death. The concept of "lifestyle" begins with the premise that the conduct of individuals (e.g. the use of tobacco and alcohol, their diet and level of physical activity) explains increases in the rates of these chronic degenerative diseases.<sup>9</sup>

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Table 1 offers some support for these two theories. Several chronic non-communicable diseases are among the most common causes of death of Mexican people. Several of these diseases are related to individual behavior. For example, diabetes mellitus, ischemic heart disease, hypertension, and certain forms of cancer are related to a sedentary lifestyle and diets which are high in certain nutrients (i.e. saturated fat or sodium) but deficient in others (i.e. fiber or antioxidants). Nevertheless, it is important to note that the causes of illness linked to unhealthy living conditions and unmet basic needs (such as malnutrition and infection) still contribute to a substantial number of deaths.

**Table 1**  
**Principle causes of general mortality in Mexico, 2005**

No.	Causes	Rate <sup>1</sup>
1	Diabetes mellitus	63.0
2	Ischemic heart disease	50.0
3	Cirrhosis and other chronic liver diseases	25.9
4	Cerebrovascular disease	25.7
5	Chronic obstructive pulmonary disease	19.0
6	Conditions originating during the perinatal period	15.5
7	Motor vehicle traffic accidents	14.8
8	Acute lower respiratory infections	14.1
9	Hypertensive diseases	12.1
10	Nephritis and nephrosis	10.7
11	Assaults (homicides)	9.3
12	Protein calorie malnutrition	7.9
13	Malignant tumors of the trachea, bronchus, and lung	6.6
14	Malignant tumor of the stomach	5.0
15	Malignant tumor of the liver	4.5
16	Malignant tumor of the prostate	4.5
17	HIV/AIDS	4.4
18	Intentional self-harm (suicides )	4.0
19	Malignant tumor of the cervix	4.0
20	Intestinal infectious diseases	4.0

<sup>1</sup> Rate per 100,000 inhabitants. Source: Reference 10

Although these statistics offer them some support, these two theoretical approaches demonstrate their limitations when used in isolation. They give the impression that Mexican society is homogeneous and that the experiences of health and disease are similar among different social groups. As will be discussed below, there are systematic differences in the frequency of different health and illness indicators for which other conceptual models are required to help explain health and disease patterns at the population level.

### The lens of social epidemiology

Social epidemiology attempts to understand how social, cultural, political, and economic processes determine the distribution of health and disease in populations.<sup>11,12</sup> One premise of social epidemiology is that our existence is organized into hierarchies where levels of greater complexity usually determine those of lesser complexity, although social epidemiology also recognizes dynamic and bidirectional relationships. Social organization<sup>1</sup> influences phenomena such as the characteristics of localities and families (at the middle or group level); these society and community levels influence behavior, biology, and subjectivities of individuals (at the micro or personal level). Thus, the second premise of this theory is that biological and psychological processes are subordinated to social ones.

Another premise of this approach is that in order to understand collective health problems, one must understand the place of specific social groups within a given society.<sup>13,14</sup> A group's social place defines a structure of risks and opportunities that limit or promote the development of those potentials which are inherent in humans. The structures of risks and opportunities manifest themselves in specific morbidity and mortality profiles created by living conditions that are relatively similar within a group but differ between social groups.<sup>14</sup>

Any understanding of collective health problems must begin with the study of social groups. Researchers cannot simply analyze average health indicators (e.g. life expectancy); they must study their distribution or differences among individuals and groups within the population.<sup>15</sup>

Social inequality is one of the fundamental concepts within social epidemiology given that social epidemiology is, in essence, the study of the living and health conditions of social groups. Social inequalities in the health field have been defined as health disparities either within a particular country and among different countries that are considered unfair, unjust, avoidable, and unnecessary; and that systematically burden populations which have been rendered vulnerable by underlying social structures and by political, economic, and legal institutions.<sup>16</sup> Among the existing forms of social inequality are those determined to originate in socio-economic or social class stratification and discrimination based on gender, race, ethnicity,<sup>14</sup> and sexual orientation.

<sup>1</sup> At the macro or societal level this includes forms of government, cultural norms, and socio-economic stratification.

Socio-economic stratification is one of the most important structures in the formation of social groups. Socio-economic stratification creates differences between individuals and social groups based on disparate access to material wealth and the power derived from it.<sup>17</sup> Membership in a low socio-economic stratum implies exposure to more risk factors and fewer opportunities to develop one's biologically innate and socially valued potential; this usually signifies greater likelihood of contracting various diseases. Socio-economic position also determines an individual's opportunities and living conditions.<sup>18</sup> The risks and opportunities are relatively homogeneous among individuals of the same social position but differ among individuals located in different social groups. Socio-economic status is closely linked to the ways that individuals perceive and understand their environment.

A final concept concerns the relationship between poverty and socio-economic stratification. There are societies with low levels of poverty and inequality (e.g. northern European countries) and others with high inequality despite the low levels of absolute poverty (e.g. the United States of America). In Mexico poverty cannot be understood without considering social inequality. Many Latin American countries exhibit these same two characteristics: a substantial proportion of the population is poor and the country presents significant social stratification. In Mexico, the problem is not a lack of wealth, but rather its concentration. In other words, inequality generates poverty not lack of economic development. To illustrate this point, we can see that the World Bank<sup>19</sup> places Mexico, along with Costa Rica and Uruguay in the top range of middle-income countries (*upper middle-income*). ECLAC reported that between 2008 and 2009 the percentage of the population in poverty in these three countries was 34.8%, 18.9% and 10.4%, while their Gini coefficients were 0.515, 0.501 and 0.433 respectively.<sup>20</sup>

It is also possible to analyze the link between socio-economic stratification and poverty at the individual level. As will be discussed in the next section, there is evidence of health differences even within the non-poor population. This suggests that not just poverty, but socio-economic differences themselves can negatively impact health.

### **The empirical evidence**

An initial review of health inequality in Mexico can be made by examining the relationship between the socio-economic characteristics of the states with the frequency of different disease indicators. Figure 1 shows the correlation between increases in female literacy and reduction in the percentage of

malnourished children while an increase in the percentage of workers who earn less than the minimum wage is accompanied by an increase in the mortality rate from diarrhea. Indicators of improved living conditions are negatively related to indicators of morbidity and mortality. These results point to geographical divisions that exist in Mexico where poorer states exhibit higher child mortality rates while states with greater economic development have better health indicators.

The municipality offers a second level where socio-economic inequality can be analyzed. In one study, researchers examined the relationship between the socio-economic characteristics of Mexican municipalities and the child mortality rate.<sup>21</sup> In 1990 the higher child mortality rate in rural municipalities was associated with an increase of the following indicators: the percentage of the population without education, the percentage of women who did not know how to read and write, the percentage of households with overcrowding, and the marginalization index of CONAPO. In urban municipalities, the principle predictors of child mortality were: the average annual income of employed workers, the percentage of the population that was illiterate, the marginalization index of CONAPO, the percentage of houses with dirt floors, the per capita gross domestic product (GDP), and the percentage of workers that had no source of income. Similarly, municipalities with higher levels of marginalization were those that displayed the highest levels of years of life lost (YLL) due to diarrheal diseases, protein-energy malnutrition, maternal mortality, tuberculosis, alcoholism and pneumonia.<sup>6</sup>

Comparison of socio-economic differences in health among individuals is the third level of analysis. Brofman and Tuirán, using data from the 1982 Mexican National Demographic Survey, operationalized the Marxist concept of social class and evaluated its relationship with child mortality.<sup>18</sup> The authors found that the probability of death between birth and the second year of life was highest in families of rural workers (104.2 per 1000 births), workers in small businesses (71.2 per 1000 births) and unsalaried, marginally employed workers (69.8 per 1000 births); the lowest probability of death occurred in the bourgeoisie (39.4 per 1000 births) and the new petit bourgeoisie (31.3 per 1000 births).

Table 2 shows that a rise in income correlates to lower rates of hepatitis A infections. Hepatitis A is transmitted primarily through the consumption of contaminated food or water.

**Table 2: Percentage (%) of subjects with protective antibodies against Hepatitis A (stratified by income and age)**

Income Quartile	Antibodies to the hepatitis virus		
	1 to 9 years	10 to 19 years	> 20 years
I and II	48	44.1	27.6
III	86.2	78.5	75.1
IV	99.5	99	96.8

Source: Reference 22

These three different levels of data document the well-known link between poverty and infectious/deficiency diseases. This relationship can be explained. Impoverished individuals have greater difficulties in obtaining adequate food supplies; over the long term this leads to chronic malnutrition. Malnutrition, together with unhealthy housing conditions, leads to an increase in the rate of infectious diseases. These empirical findings led to the idea that infections and nutritional deficiencies were "diseases of poverty," while other diseases – such as the chronic illnesses – were the "diseases of affluence."<sup>23</sup>

Nevertheless, people of low socio-economic position are now also exhibiting higher rates of a variety of chronic diseases and other health problems in addition to infectious and deficiency diseases.

Figure 2 show the relationship between the rates of mortality from two chronic diseases (cervical cancer and cirrhosis) and economic development indicators at the state level. The states with the lowest GDP tend to have higher rates of mortality from cervical cancer. Similarly, an increase in the percentage of households with a refrigerator is

negatively correlated with cirrhosis mortality in males.

An analysis of data on morbidity from chronic diseases (obesity, hypertension and diabetes) according to education levels shows a clear gradient: as the level of education decreases rates of these diseases increase (Table 3). Unlike deficiency and infectious diseases, chronic diseases can hardly be attributed directly to poor sanitary conditions or poor food intake. Poverty is not just generating deficiency and infectious diseases; it is also associated with the chronic diseases that are the leading causes of death in our country.

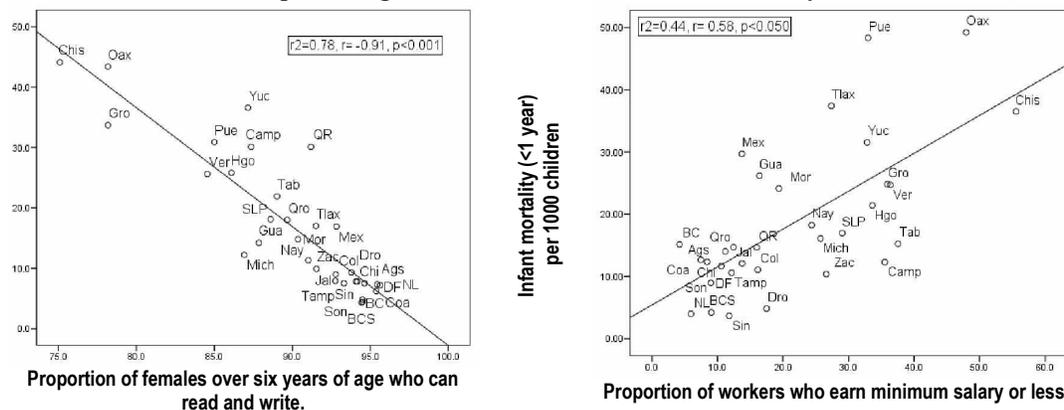
**Table 3: Percentage (%) of subjects with selected chronic diseases (stratified by educational level)**

Educational attainment	Excess weight (women)	Hypertension (Adults)	Diabetes (Adults)
None	24.68	44	15.1
Primary	21.84	35.3	9.7
Secondary	13.11	25.7	4.5
Vocational	10.1	22.8	3.9
University		22.9	4.8

Sources: Obesity Reference 24, Hypertension & Diabetes, Reference 25

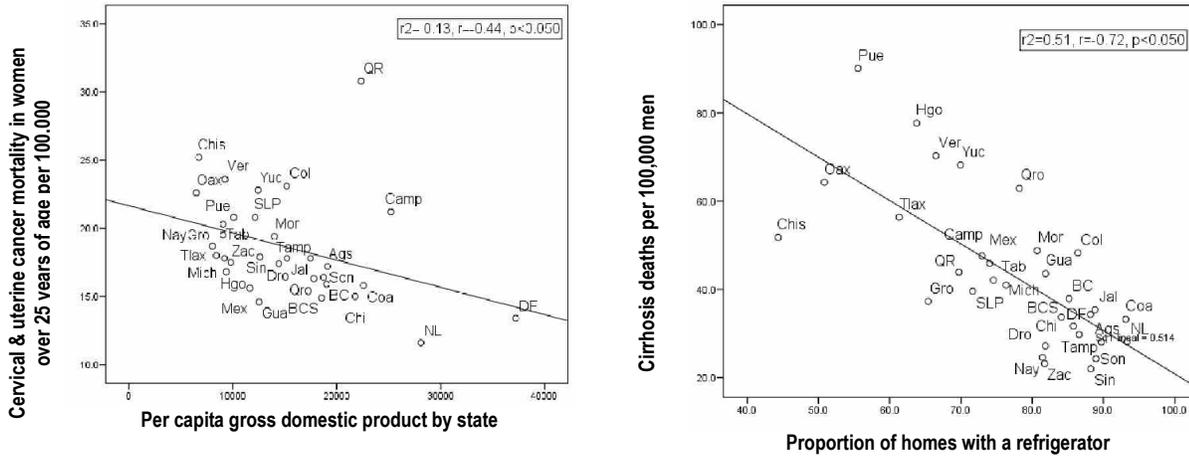
In industrialized countries, researchers have documented that individuals from low economic strata have higher rates of obesity, arterial hypertension, and diabetes mellitus.<sup>26</sup> To explain socio-economic differences in the distribution of chronic diseases, it has been theorized that individuals from lower stratum lack access a healthy diet (i.e. inadequate resources to purchase fruits and vegetables) and face obstacles to participation in

**Figure 1: Relationship between socio-economic characteristics and the percentage of malnutrition and infant mortality at the state level, Mexico**



Source: Compiled from 2005 Population and Housing Census data and malnutrition and mortality data reported by the Ministry of Health.

**Figure 2: The relationship between certain socioeconomic characteristics and mortality from cervical cancer and cirrhosis at the state level, Mexico**



recreational physical activity.<sup>27,28</sup> Another explanation that has been suggested is that individuals from lower social stratum have little control over their work activities; this lack of control combined with their subordinated social position generates neuroendocrine responses that have been related to atherosclerosis.<sup>29</sup>

Table 4 shows that infection with the hepatitis B virus is higher among people who are illiterate or have lower incomes, such as day-laborers and the marginally employed. Hepatitis B has a mode of transmission distinct from hepatitis A, since it is transmitted by parenteral (i.e. contaminated blood), sexual and perinatal means. Table 4 also shows that HIV infection is more common among unpaid workers, day laborers and small-scale farmers, but less common among employers. Nevertheless, it is noteworthy that individuals with higher levels of education are those who maintain a greater risk of infection from HIV. In Mexico, the principal mode of transmission of HIV infection is through sex for which the use of a condom as a preventive measure has been promoted.

Table 5 shows that individuals with lower education levels maintain lower rates of condom use and are less likely to be tested for HIV infection. This situation points to the existence of a double inequality as individuals who are socially disadvantaged are more prone to contract infection (due to their lower rate of condom use), while they are also less likely to be tested for HIV infection resulting in a greater probability of developing AIDS.

**Table 4: Percentage (%) of subjects with Hepatitis B & HIV infection (stratified by social indicators)**

	Antibodies indicating Hepatitis B infection (%)
<b>Income</b>	
I Quartile	4.9
II Quartile	3.2
III Quartile	2.8
IV Quartile	2.6
<b>Position at work</b>	
Employer	1.1
Employee	1.9
Self-employed	3.9
Laborer	4.1
<b>Literate</b>	
Yes	2.9
No	8.1
	Antibodies indicating HIV infection (%)
<b>Educational level</b>	
Primary <	0.24
Secondary	0.19
Preparatory/technical	0.24
Professional >	1.0
<b>Position at work</b>	
Employee/worker	0.28
Day laborer/laborer	0.41
Employer	0.0
Self-employed	0.21
Unpaid worker	3.07

Sources: References 30 (Hepatitis B), 31 (HIV)

**Table 5: Percentage (%) of subjects who use condoms and are tested for HIV (stratified by educational level)**

Educational level	Condom usage	HIV tested
Primary or less	18.9	8.1
Secondary	16.5	11.7
High School/Vocational	21.0	14.5
Professional or more	24.1	16.9

Source: Author's own estimates from the National Survey of Performance Evaluation database, 2002.

Table 6 shows that among adults in Mexico, the rate of depression is higher among individuals living in low-income households; this is found in both men and women. When it comes to the perception of good health (a positive indicator), the pattern is reversed, i.e., subjects of lower stratum were less likely to report that they perceive their health as good. As a result, individuals who answered that their health was good or very good were less likely to experience premature death

**Table 6: Indicators of psychological health in adults (stratified by income, reported in percentages)**

Income Quartile	Depressed		Self-reported good health	
	Men	Women	Men	Women
I	3.3	5.8	7.7	6.1
II	2.4	5.4	6.4	5.3
III	2.1	5.6	5.4	4.4
IV	2.0	4.6	5.8	3.8

Source: Author's own estimates from the National Survey of Performance Evaluation database, 2002

Finally, although the rate of pedestrian accidents increases as socio-economic status falls, motor vehicle related accidents are more often experienced by individuals from higher social stratum (Table 7).

**Table 7: Percentage of subjects experiencing non-fatal vehicular accidents (stratified by socio-economic level)**

Socio-economic level	Motor vehicle accidents	Pedestrian accidents
I	0.38	0.25
II	0.39	0.23
III	0.83	0.19
IV	1.40	0.18

Source : Reference 32

## Conclusions

The introduction of this paper reviewed the principle causes of death in Mexico and noted that infectious diseases and malnutrition coexist with chronic diseases, injuries, and accidents. The

prevailing explanation for this mortality profile is based on the concepts of the epidemiological transition and lifestyle choices. Yet the data reviewed in the remainder of the paper (the product of representative cross-sectional surveys) demonstrate that average values mask a pattern, a consistent pattern: in the majority of diseases there exists a socio-economic gradient. People of low socio-economic status have a greater probability of seeing their health compromised. As such, it is important to emphasize that many (but not all) public health problems have a greater impact on individuals from the lower social stratum.

As in other societies<sup>33,34</sup>, Mexican socio-economic inequality is made manifest in differential rates of morbidity and mortality. Individuals with more precarious socio-economic positions have higher rates of child mortality and the other health issues related to emerging economies (e.g. infections and malnutrition). One explanation for this pattern is that those from lower economic stratum experience at greater material deprivation which limits their food consumption and often lead to unsanitary living conditions.<sup>3</sup>

Nevertheless, among the Mexican population, individuals from low socio-economic levels also experience higher rates of weight gain, diabetes, and hypertension. To understand the socio-economic differences in chronic diseases requires an explanatory framework that considers how working<sup>13</sup> and living<sup>35</sup> conditions in conjunction with lifestyle<sup>9</sup> may be linked to certain changes in the biology and subjectivity of individuals. Some tentative explanations suggest that people from lower stratum face more social stresses, live in places where there are fewer opportunities for recreation<sup>9</sup> and see themselves as subordinates within the societal structure.<sup>36</sup>

Many health problems arise from an individual's personal conduct. But the health problems of those from lower social strata do not depend solely on their individual decisions; they depend on the options they have available to them. To maintain a healthy diet, physical activity, or use a condom is contingent in large part on the material and symbolic resources available to households and individuals. From the social epidemiology perspective, prevention strategies should be aimed at the three levels previously described (social, group, and individual). The solutions do not depend entirely on the health sector or on health professionals<sup>37,38</sup>.

Strategies that can promote health at the social level include: the redistribution of wealth through employment and wage policies or the reduction of discrimination based on gender, ethnicity or sexual

orientation.<sup>34,39</sup> Governments can serve a regulatory function with respect to the media and the production and marketing of goods (e.g. food, tobacco and alcohol). Governments can ensure that basic needs are met; this would include access to health services, adequate food, recreation and transportation.<sup>14,26,37</sup> In addition to programs targeted to combat poverty (i.e. the Mexican *Oportunidades* anti-poverty program) other measures – involving more than just the health sector – should be considered. These might include a minimum wage sufficient to pay for a lifestyle allowing “healthy behaviors.” This minimum salary might be guaranteed by labor and economic policies which might include job training programs, fiscal incentives for employers to hire people of lower social stratum, money transfers for individuals whose income is below the minimum, unemployment insurance, and price regulation of basic goods.<sup>40,41</sup> These policy changes imply substantial transformations in how governmental institutions operate. The changes can be achieved through political mobilization.<sup>14,40</sup>

At the group level, we see the creation of “healthy environments” in schools, workplaces and communities. This level includes the provision of health information and clinical care to individuals. These alone will not be sufficient however if there are no changes at the other two levels. Thus, to reduce health inequities requires intersectoral policies that must include the health care sector, but must also reach out to the involve the society at large.

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