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Income-related inequalities and inequities in health and health care utilization in Mexico, 2000–2006

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ABSTRACT

Objective. To measure income-related inequalities and inequities in the distribution of health and health care utilization in Mexico.

Methods. The National Health Survey (NHS) 2000 and the National Health and Nutrition Survey (NHNS) 2006 were used to estimate concentration indices for health outcomes and health care utilization variables before and after standardization. The study analyzed 110 460 individuals 18 years or older for NHS 2000 and 124 149 individuals for NHNS 2006. Health status variables were self-assessed health, physical limitations, and chronic illness. Health care utilization included curative visits and dental, hospital, and preventive care. Individuals were ranked by three standard-of-living measures: household income, wealth, and expenditure. Other independent variables were area of residence, geographic region, education, employment, ethnicity, and health insurance. Decomposition analysis allowed for assessing the contributions of independent variables to the distribution of health care among individuals.

Results. The worse-off population reports less good self-assessed health and more physical limitations, whereas better-off individuals report more chronic illnesses. Utilization of curative visits and hospitalization is more concentrated among the better-off population. No significant changes in these results can be established between 2000 and 2006. According to available evidence, standard of living, health insurance, and education largely contribute to the inequitable distribution of health care.

Conclusions. Despite improvements in health care utilization patterns, income-related health and health care inequities prevail. Equity remains a challenge for Mexico.

Key words Equity; equity in health; social inequity; health systems; health policy; Mexico.

Inequities in health and health care have been a constant concern in Mexico as a result of persistent inequalities in the distribution of wealth and other socioeconomic factors and characteristics of the health system that determine differential rules of financing and access to health services across population groups.

With a population of more than 110 million, Mexico is experiencing both a demographic and an epidemiologic transition. The former is reflected in the aging of the population. By 2050, close to 25% of the population will be 60 years or older (1). The epidemiologic transition is essentially indicated by changes in the leading causes of death and burden of disease and their distribution among different population groups (2, 3). Noncommunicable diseases account for 84% of all deaths and 68% of the burden of disease, as measured by the number of

healthy life years lost to premature death and disability (2, 4).

Large differences in health status among regions and population groups are observed. Despite the aforementioned transitions, persisting communicable diseases are more concentrated among the poor, rural, and indigenous populations. As a result, these groups show higher infant and maternal mortality than the general population. There is a 10-year difference in life expectancy between the three states with the highest level of marginalization (Chiapas,

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Guerrero, and Oaxaca) and urban areas with better health (2). Such disparities may be due to multiple factors, including access to health insurance, effective access to services when in need, and heterogeneity in the quality of services (5, 6).

The Mexican health system, like that of many Latin American countries, is highly segmented (5, 6). It is composed of three large segments: social security institutions that provide access to medical care to affiliates and their families; care provided by the Ministry of Health to the population without access to social security, including Seguro Popular (SP), a voluntary public health insurance scheme; and private health services catering to the general population and mostly financed through out-of-pocket payments. The Ministry of Health provides care through decentralized services run by state-level governments and federal high-specialty hospitals.

In 2000, 49% of the Mexican population had access to social security (7). At that time, it became clear that the lack of universal health insurance coverage and a segmented system with different financing rules had created a number of problems. More than half of health spending came from out-of-pocket expenses, and catastrophic and impoverishing expenditures disproportionately affected low-income families (8, 9). A number of inequalities in financing among public institutions, states, and contributions made by state governments were also identified (10, 11).

To address these matters, SP came into operation in 2004 (5, 12). It targets the population without access to social security, covers an explicit set of interventions, and has introduced more equitable funding rules, thus seeking to promote greater equity in health care utilization by preventing access from being determined by one's capacity to pay. To the extent that public funding is now linked to an auditable roster of beneficiaries, it should benefit those states with low levels of social security coverage. Affiliation with SP has been prioritized among the poorest population in the most marginalized areas, including rural and indigenous communities. Since SP was implemented, public spending for the population without social security has increased significantly. In 2000, per capita public spending for the population with social security was 2.2 times

the corresponding amount for the population without social security. The difference narrowed to 1.8 times in 2006 and to 1.5 times in 2010 (13). SP is the second largest public health insurer. In 2011, while social security covered 59.2 million Mexicans, SP already covered 43.5 million, almost half of the Mexican population (14, 15).

Few studies have addressed disparities in health and health care utilization in Mexico at the individual level. Most literature has focused on measuring gaps or using larger units of analysis (municipalities or states). Although identified studies are not directly comparable because of differences in methodology, variables, and years analyzed, their results confirmed the existence of significant inequalities in health outcomes and health care utilization among population groups, states, and municipalities by level of income and among individuals with and without social security (16–21).

The main objective of this study is to measure income-related inequalities and inequities in health and health care utilization in Mexico in 2000 and 2006 and to establish whether they have changed. Using decomposition analysis, this paper also provides new evidence on the contribution of demographic, socioeconomic, and health system–related variables to the distribution of health care among individuals.

MATERIALS AND METHODS

Study design

This study is descriptive. The agreed methodology for all country studies is detailed in an introductory paper in this issue (22).

Data sources and sample size

Two household surveys were used: the National Health Survey (NHS) 2000 and the National Health and Nutrition Survey (NHNS) 2006. Both surveys are cross-sectional, based on probability sampling, stratified, clustered by urban and rural location, and representative at the national level (23, 24).

NHS 2000 included 187 786 individuals in 45 827 households. NHNS 2006 had a slightly larger sample with 205 877 individuals in 47 152 households. The unit of analysis was the individual adult

(18 years or older); 110 460 adults were analyzed for NHS 2000 and 124 149 were analyzed for NHNS 2006.

Variables

The analysis focused on two groups of dependent variables: health status and health care utilization. Table 1 describes the variables used. Health status variables were self-assessed health, physical limitations, and chronic illness; health care utilization variables were curative visits, dental care, hospitalization, and inpatient days. NHS 2000 did not include information on chronic illness. However, it did include a question on the use of preventive services, which was also analyzed.

Two of the dependent variables—self-assessed health and inpatient days—used a different recall period between 2000 and 2006. Individuals may have a recall bias or may rate their health differently when asked to consider today (2006) and the past year (2000). For the purpose of this paper, it was assumed that the potential implications of such differences did not affect the analysis, which focused on the distribution of the variable across income groups. It was also assumed that any potential difference between 2000 and 2006 in the way individuals assessed their health had the same impact on all individuals across all income groups. The same principle applied for inpatient days. In the 2000 survey, this variable referred to the length of stay of the latest hospitalization; in 2006, it referred to the total number of inpatient days over the past year. This issue is further analyzed in the discussion.

The independent variables of primary interest were those related to living standards. Both surveys provided information on the household's monthly income. NHNS 2006 also included information on household expenditure. When household expenditure was calculated, expenses on outpatient health services and hospitalization were excluded because the aim was to construct a proxy of permanent income (25). Per capita income and expenditure were estimated in terms of the number of equivalent adults living in the household (22, 25).

A household wealth index was constructed by using the method of principal components and a tetratonic correlation matrix for 15 household assets and characteristics: wall, floor, and roof

TABLE 1. Description of variables, Mexico, 2000 and 2006

Variable	NHS 2000	NHNS 2006
Health status		
Any chronic illness	Not available	Binary (any chronic illness = 1)
Any physical limitation	Binary (any physical limitation = 1)	Binary (any physical limitation = 1)
Self-assessed health	Binary (less than good = 1), reference period: over past year	Binary (less than good = 1), reference period: today
Health care utilization		
Any dental care	Binary (received care provided by a dentist in past 2 weeks = 1, conditional on having reported a health problem)	Binary (received care provided by a dentist in past 2 weeks = 1, conditional on having reported a health problem)
Any hospitalization	Binary (any hospitalization in past 12 months = 1)	Binary (any hospitalization in past 12 months = 1)
Total inpatient days	Numeric count (number of hospital days during last hospitalization)	Numeric count (number of hospital days over past year)
Any curative visit	Binary (received care provided by a physician in past 2 weeks = 1, conditional on having reported a health problem)	Binary (received care provided by a physician in past 2 weeks = 1, conditional on having reported a health problem)
Any preventive care	Binary (sought or received care in past 12 months = 1)	Not available
Standard of living		
Expenditure	Not available	Continuous (household monthly expenditure per equivalent adult)
Income	Continuous (household monthly income per equivalent adult)	Continuous (household monthly income per equivalent adult)
Wealth index	Continuous (household wealth index based on 15 housing conditions and asset variables)	Continuous (household wealth index based on 15 housing conditions and asset variables)
Other		
Age (years)	Categorical: 18–34, 35–44, 45–64, 65–74, 75+	Categorical: 18–34, 35–44, 45–64, 65–74, 75+
Area of residence	Binary (urban = 1)	Binary (urban = 1)
Education	Categorical (none, primary, secondary, high school or higher)	Categorical (none, primary, secondary, high school or higher)
Employment status	Categorical (employed, unemployed, inactive, student, housework, retired)	Categorical (employed, unemployed, inactive, student, housework, work without remuneration, retired)
Gender of household head	Categorical (female = 1)	Categorical (female = 1)
Geographic region	Categorical (north, center, Federal District, south)	Categorical (north, center, Federal District, south)
Health insurance	Categorical (uninsured, social security/private/double)	Categorical (uninsured, social security/private/double, Seguro Popular)
Household size	Numeric count (does not include domestic workers and their children)	Numeric count (does not include domestic workers and their children)
Marital status	Categorical (cohabitation, married, separated/divorced, widowed, single)	Categorical (cohabitation, married, separated/divorced, widowed, single)
Race/ethnicity	Binary (indigenous = 1, speaking an indigenous language or self-described as indigenous)	Binary (indigenous = 1, speaking an indigenous language)
Gender	Binary (male = 1)	Binary (male = 1)

NHS: National Health Survey, NHNS: National Health and Nutrition Survey.

material; type of toilet facility; having electricity, a separate kitchen, radio, television, tape recorder, blender, refrigerator, washer, telephone, boiler, and car or truck (26). The first principal component explained 66.0% of the variability of the 15 variables in 2000 and 50.7% in 2006. The resulting index ranged from 0 to 3.84 in 2000 and from 0 to 3.74 in 2006, with higher index values reflecting greater wealth.

Missing values for living-standard variables were imputed by using the hot-deck method. The percentage of imputed cases (households) did not exceed 5% in either survey for each living-standard variable, with the exception of the 2006 income variable, where it was equal to 12%. Sensitivity analysis showed that the estimates did not change significantly when observations with missing values were excluded from the analysis.

Other control variables included age dummies, gender, education, area of residence, geographic region, employment status, ethnicity, marital status, health insurance, household size, and gender of the household head. Response options of the health insurance variable in 2006 included SP. Control variables were used in estimating the concentration indices and the decomposition analysis.

Statistical analysis

The indirect method was used to standardize health status and health care utilization by variables of need and non-need (22, 25). Reduced linear models were used to estimate predictions for all dependent variables (27, 28). Adjustments were made to account for the clustering and stratification of the survey data.

The need variables used for standardizing health status were interactions of age and gender dummies. The rest of the control variables, including living-standard variables, were treated as non-need variables. In health care utilization models, correlations between health status variables and living-standard measures were first evaluated. If the relationship was negative, given that higher-income populations are expected to enjoy better health, the health status variables were classified as need vari-

ables. If the relationship was positive, meaning that individuals with higher incomes reported poorer health, health status variables were classified as non-need variables. The latter case was observed only for chronic illness.

For all variables of interest, means by population quintile, unstandardized concentration indices (CI), standardized concentration indices (HI), and concentration curves using three alternative ranking variables were estimated. Decomposition analysis of the HI was used to measure the contribution of each need and non-need variable to the distribution of health status and health care utilization (22, 25).

RESULTS

Table 2 presents the descriptive statistics of all variables. Between 2000 and 2006, the percentage of the adult population who reported having less-than-good health declined from 45.6% to 35.9%, while the proportion of the population who reported having physical limitations increased slightly from 3.3% to 3.6%. Approximately 10% of the adult population reported having a chronic health problem in 2006. In 2000, 7.9% of adults reported having had a curative visit in the past two weeks, while 5% had been hospitalized during the past year. Both decreased marginally between 2000 and 2006. With regard to living standards, the average value of the wealth index decreased between 2000 and 2006.

With regard to health insurance status, for both years the uninsured population represented the highest percentage of the population. However, it decreased from 55.2% in 2000 to 50.8% in 2006 because of the introduction of SP. The percentage of the surveyed adult population affiliated with this scheme in 2006 was 8.6%.

Table 3 presents mean values and quintile distributions for all variables, while Table 4 provides estimates of the CI and HI. Ill health and physical limitations were concentrated disproportionately among the worse-off population, while chronic illness showed a higher concentration among the better-off population. The type of living-standard variable chosen for individual ranking affects the analysis. For self-assessed health, the gradient is clearly marked across all living-standard variables. For physical limitations, the gradient is steeper when

TABLE 2. Descriptive statistics, Mexico, 2000 and 2006

Variable	Mean	
	2000	2006
Any chronic illness	NA	0.1030
Any physical limitation	0.033[a]	0.036[a]
Self-assessed health (less than good)	0.456[a]	0.359[a]
Any dental care	0.001	0.001
Any hospitalization	0.050[a]	0.046[a]
Total inpatient days	4.379	6.781
Any curative visit	0.079[a]	0.072[a]
Any preventive care	0.274	NA
Expenditure (current pesos)	NA	1 676
Income (current pesos)	1 726	2 463
Wealth index	2.71[a]	2.57[a]
Age (years)		
18–34	0.521[a]	0.422[a]
35–44	0.197[a]	0.210[a]
45–64	0.205[a]	0.257[a]
65–74	0.048[a]	0.067[a]
≥ 75	0.032[a]	0.044[a]
Area of residence		
Urban	0.625[a]	0.793[a]
Rural	0.375[a]	0.207[a]
Education		
No education	0.020[a]	0.101[a]
Primary	0.434[a]	0.376[a]
Secondary	0.231[a]	0.219[a]
High school or higher	0.314	0.305
Employment status		
Employed	0.542[a]	0.506[a]
Unemployed	0.006[a]	0.012[a]
Inactive	0.062[a]	0.087[a]
Student	0.046	0.047
Housework	0.324[a]	0.299[a]
Work without remuneration	NA	0.015
Retired	0.020[a]	0.031[a]
Gender of household head		
Female	0.201[a]	0.183[a]
Geographic region		
North	0.198	0.198
Center	0.400	0.406
Federal District	0.101	0.098
South	0.300	0.298
Health insurance		
None (uninsured)	0.552[a]	0.508[a]
Social security/private/double	0.443[a]	0.403[a]
Seguro Popular	NA	0.086
Household size	4.647[a]	4.905[a]
Marital status		
Cohabitation	0.140[a]	0.131[a]
Married	0.514	0.516
Separated/divorced	0.038[a]	0.046[a]
Widowed	0.047[a]	0.058[a]
Single	0.261[a]	0.250[a]
Race/ethnicity		
Indigenous	0.063	0.066
Gender		
Male	0.485[a]	0.463[a]
Female	0.515[a]	0.537[a]

NA: not available.
[a] Significant values of hypothesis testing of difference of means or proportions ($P < 0.05$).

TABLE 3. Mean and quintile distributions of health and health care utilization by living-standard measure, Mexico, 2000 and 2006

Variable	Year	Mean	Poorest 20%	2nd poorest 20%	Middle	2nd richest 20%	Richest 20%
Ranking variable: expenditure							
Health status							
Any chronic illness	2000	NA	NA	NA	NA	NA	NA
	2006	10.48	7.64	8.93	10.53	11.61	12.86
Any physical limitation	2000	NA	NA	NA	NA	NA	NA
	2006	3.70	3.87	3.94	3.46	3.65	3.64
Less than good self-assessed health	2000	NA	NA	NA	NA	NA	NA
	2006	35.75	38.64	38.27	37.25	35.11	30.67
Health care utilization							
Any dental care	2000	NA	NA	NA	NA	NA	NA
	2006	0.07	0.04	0.06	0.05	0.11	0.07
Any hospitalization	2000	NA	NA	NA	NA	NA	NA
	2006	4.59	3.26	3.75	4.54	5.02	5.98
Total inpatient days	2000	NA	NA	NA	NA	NA	NA
	2006	6.99	6.30	8.18	6.91	6.56	7.05
Any curative visit	2000	NA	NA	NA	NA	NA	NA
	2006	7.38	4.93	6.11	7.73	7.96	9.47
Any preventive care	2000	NA	NA	NA	NA	NA	NA
	2006	NA	NA	NA	NA	NA	NA
Ranking variable: income							
Health status							
Any chronic illness	2000	NA	NA	NA	NA	NA	NA
	2006	10.47	9.20	10.33	10.81	11.08	10.63
Any physical limitation	2000	2.47	2.97	2.81	2.56	2.21	2.11
	2006	3.70	4.86	4.29	3.80	3.38	2.63
Less than good self-assessed health	2000	44.40	51.18	50.59	47.97	42.78	34.98
	2006	35.71	41.42	39.96	38.96	34.45	26.87
Health care utilization							
Any dental care	2000	0.09	0.06	0.11	0.09	0.09	0.10
	2006	0.07	0.09	0.02	0.07	0.09	0.06
Any hospitalization	2000	4.98	3.84	5.02	5.02	5.26	5.30
	2006	4.59	4.16	4.69	4.32	4.78	4.88
Total inpatient days	2000	4.35	4.37	4.02	4.92	4.33	4.14
	2006	6.99	6.62	7.11	6.78	7.68	6.67
Any curative visit	2000	7.69	6.29	7.18	7.78	7.97	8.53
	2006	7.38	6.28	7.04	7.38	7.63	8.17
Any preventive care	2000	27.02	28.20	26.74	26.02	25.59	28.53
	2006	NA	NA	NA	NA	NA	NA
Ranking variable: wealth index							
Health status							
Any chronic illness	2000	NA	NA	NA	NA	NA	NA
	2006	10.48	8.10	10.46	11.03	11.24	11.14
Any physical limitation	2000	2.47	2.37	2.72	2.61	2.54	2.15
	2006	3.70	4.39	3.94	4.16	3.42	2.79
Less than good self-assessed health	2000	44.43	50.06	52.11	47.27	43.42	33.01
	2006	35.66	41.77	41.40	39.01	32.71	25.76
Health care utilization							
Any dental care	2000	0.09	0.06	0.08	0.06	0.16	0.09
	2006	0.07	0.06	0.04	0.08	0.10	0.05
Any hospitalization	2000	4.98	3.59	4.61	5.11	5.43	5.60
	2006	4.59	3.44	4.67	4.60	4.95	5.09
Total inpatient days	2000	4.35	4.61	4.20	4.65	3.89	4.56
	2006	6.98	6.28	7.36	6.81	7.09	7.13
Any curative visit	2000	7.67	5.25	7.16	7.85	8.04	9.14
	2006	7.38	5.78	7.15	7.44	8.08	8.11
Any preventive care	2000	26.99	27.02	24.75	26.62	26.69	29.42
	2006	NA	NA	NA	NA	NA	NA

NA: not available.

income is used; for chronic conditions, it is steeper when the expenditure variable is used. Utilization is more concentrated among better-off individuals, with the exception of dental care and inpatient days. The results vary depending on the living-standard variable used for ranking, with a steeper gradient in the case of the expenditure variable.

The CI and HI values indicate that, given similar health needs, the higher-income population used more curative and hospital care than the low-income population. For dental care and inpatient days, the CI were not statistically significant. The low response rate, and thus small sample size, for both variables requires caution in interpreting the observed results. These results are corroborated by the concentration curves presented in supplementary material. Results do not show great variation between unstandardized and standardized indices.

With regard to differences in the HI values between 2000 and 2006, inequities in health outcomes for the worse-off population seem to have increased, although differences were not statistically significant (Table 4). As for health care utilization, the only relevant statistically significant difference corresponded to curative visits when income was used as the ranking variable: pro-rich inequities in curative visits decreased slightly. Although the difference is also statistically significant for inpatient days and dental care when the population is ranked by income, the HI values for these variables are not statistically significant in 2000 and 2006. The sensitivity of the results to the use of different ranking variables in both years was tested (data not shown). Differences were statistically significant only in 2000 for the health status variable, ranked by income and the wealth index.

Figure 1 presents the decomposition results of the HI for curative visits and hospitalization for 2000 and 2006. The analysis is presented only for these variables because they were the only ones consistently statistically significant across years and living-standard variables. According to the percentage contribution to the distribution of curative visits, if need factors were the only ones to determine its distribution, utilization would favor worse-off individuals, with health status making the

TABLE 4. CI and HI values for health and health care utilization and differences in HI, Mexico, 2000 and 2006

Variable	Year	CI	HI	Difference in HI between 2006 and 2000[a]	t-statistic
Ranking variable: expenditure					
Health status					
Any chronic illness	2000	NA	NA	n.a.	n.a.
	2006	0.1099[b]	0.1020[b]		
Any physical limitation	2000	NA	NA	n.a.	n.a.
	2006	−0.0239	−0.0189		
Less than good self-assessed health	2000	NA	NA	n.a.	n.a.
	2006	−0.0433[b]	−0.0472[b]		
Health care utilization					
Any dental care	2000	NA	NA	n.a.	n.a.
	2006	0.1030	0.1146		
Any hospitalization	2000	NA	NA	n.a.	n.a.
	2006	0.1051[b]	0.1241[b]		
Total inpatient days	2000	NA	NA	n.a.	n.a.
	2006	−0.0028	−0.0069		
Any curative visit	2000	NA	NA	n.a.	n.a.
	2006	0.1072[b]	0.1237[b]		
Any preventive care	2000	NA	NA	n.a.	n.a.
	2006	NA	NA		
Ranking variable: income					
Health status					
Any chronic illness	2000	NA	NA	n.a.	n.a.
	2006	0.0191[b]	0.0261[b]		
Any physical limitation	2000	−0.0738[b]	−0.0766[b]	0.0449	−0.44
	2006	−0.1495[b]	−0.1215[b]		
Less than good self-assessed health	2000	−0.0788[b]	−0.0792[b]	−0.0069	0.79
	2006	−0.0903[b]	−0.0861[b]		
Health care utilization					
Any dental care	2000	0.0415	0.0590	−0.0582	−1.69[c]
	2006	−0.0170	−0.0008		
Any hospitalization	2000	0.0092	0.0479[b]	−0.0210	−0.69
	2006	−0.0096	0.0269[b]		
Total inpatient days	2000	0.0131	−0.0015	0.0047	3.40[d]
	2006	−0.0049	0.0062		
Any curative visit	2000	0.0081	0.0575[b]	−0.0050	−2.62[d]
	2006	0.0041	0.0525[b]		
Any preventive care	2000	−0.0094[b]	0.0057	n.a.	n.a.
	2006	NA	NA		
Ranking variable: wealth index					
Health status					
Any chronic illness	2000	NA	NA	n.a.	n.a.
	2006	0.0588[b]	0.0523[b]		
Any physical limitation	2000	−0.0125	−0.0334[b]	0.0536	−0.35
	2006	−0.1030[b]	−0.0870[b]		
Less than good self-assessed health	2000	−0.0725[b]	−0.0816[b]	0.0145	−0.38
	2006	−0.0928[b]	−0.0961[b]		
Health care utilization					
Any dental care	2000	0.1175	0.1201	−0.0821	−1.24
	2006	0.0175	0.0380		
Any hospitalization	2000	0.0375[b]	0.0760[b]	−0.0124	−1.17
	2006	0.0266[b]	0.0636[b]		
Total inpatient days	2000	0.0231	−0.0097	0.0043	−1.09
	2006	0.0172	0.0140		
Any curative visit	2000	0.0523[b]	0.0843[b]	−0.0205	−0.62
	2006	0.0191[b]	0.0638[b]		
Any preventive care	2000	0.0214[b]	0.0228[b]	n.a.	n.a.
	2006	NA	NA		

CI: concentration index, HI: horizontal inequity index, NA: not available, n.a.: not applicable.
[a] Calculated as difference in absolute values of HI for both years. Positive value indicates increase in degree of inequity; negative value indicates decrease in extent of inequity.
[b] Statistically significant unstandardized CI and standardized CI (HI) values ($P < 0.05$).
[c] Statistically significant at 10%.
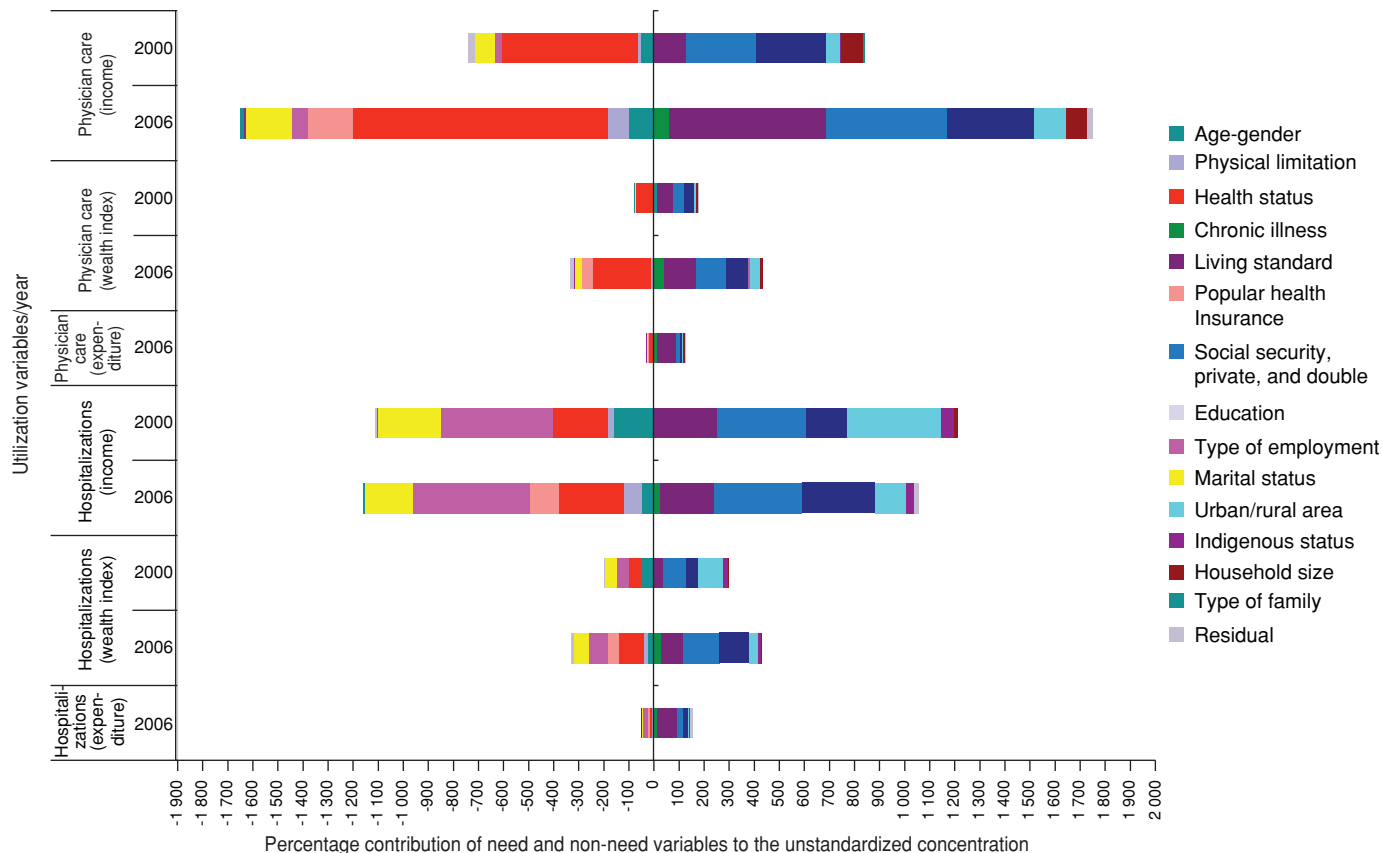[d] Statistically significant at 1%.

largest contribution to such a result. In contrast, if utilization depends only on non-need variables, it would favor even more the better-off individuals. Among non-need variables, living standard, health insurance status, and education make the largest contributions. In 2006, the percentage contribution of health insurance status was higher than in 2000 when both the income variable and the wealth index were used for ranking. In both years, social security, private, and double health insurance together contributed in various degrees to an increased use of curative visits among the better-off population. However, in 2006, if SP had been the only contributor to the distribution of curative visits, utilization would have been higher among the worse-off population. Similar results were observed for hospitalizations. Results are similar when different living-standard measures are used, except for differences in the scale or size of the resulting percentage contributions. The latter are smaller when expenditure is used and larger when income is used.

DISCUSSION

The results indicate that in 2000 and 2006, inequities in health outcomes prevailed for both the worse-off and the better-off populations. As the standard of living decreased, self-assessed health worsened. However, the higher-income population showed a greater incidence of chronic problems. These findings are consistent with those obtained in a similar earlier study (17). The higher concentration of chronic diseases in the better-off population may be due to a higher probability of diagnosing these diseases among this population. This result seems plausible, considering that evidence on epidemiologic profiles indicates that chronic conditions are not exclusive to higher-income groups but are observed throughout the population.

The analysis goes one step further in measuring social inequalities in health—that is, disparities in health and in its key social determinants, including health care—that are systematically associated with social advantage or disadvantage (29). Since measurements were made through the standardization method to assess whether individuals with similar health needs have different patterns of health care utilization according to their

FIGURE 1. Decomposition analysis of horizontal inequity index for health care utilization by living-standard measure, Mexico, 2000 and 2006

socioeconomic status, it is possible to measure horizontal equity (22).

Statistically significant inequities were found in curative visits and hospitalizations. These results are consistent with those reported in another study (21). Even after controlling for the health needs of individuals, certain groups—in most cases, the better off—enjoy greater use of medical care than the worse off. As a result, health care, a good that in many other countries is financed mostly with public resources, is allocated according to criteria other than need, with serious implications for the well-being of the most vulnerable.

Evidence is inconclusive in terms of whether inequities in health or health care utilization changed between 2000 and 2006. This result could be partly because a period longer than the six years between the two surveys is needed in order to observe trends in inequities.

Although this analysis cannot assess causality, results from the decomposition analysis suggest that non-need variables explain to a greater extent the observed distribution in the use of health services

than need variables. Self-assessed health contributes to increased utilization of curative visits and hospitalization among worse-off individuals; however, this contribution is largely offset by that of non-need variables. The fact that being insured favors utilization in the higher-income population reflects the lack of universal health insurance coverage in Mexico. Social security, private, and double health insurance contributed to increased use of care among better-off individuals. In contrast, the contribution of SP in 2006 was pro-poor, which is consistent with the expectation of increasing health care utilization among the worse off, such as medical consultations for women of reproductive age and hospital care, after introduction of SP.

In 2004, SP was introduced with the aim of promoting greater equity in health care financing as a precondition to improve equity in health outcomes. This study is not intended to measure the impact of SP on health and health care inequities, nor is it meant to analyze equity in health financing. However, the findings suggest that only two years

after introduction of this scheme and despite its positive contribution to increased utilization of services among the poor, a greater investment in health and improved resource allocation had not managed to fully translate into greater equity in health and health care. Although it would be worth revisiting the situation with more recent data, as SP has increased its coverage to almost half of the population and new survey data from NHNS 2011/2012 have been recently released, evidence thus far suggests that greater equity in financing is necessary but not sufficient to improve equity in health and health care. This result supports similar arguments in favor of increasing the effectiveness of spending as a necessary condition to translate greater equity in funding into more equitable access to services and, ultimately, reduced health inequity (30).

The main limitation of this study is the use of self-reported health status variables. There is a potential bias intrinsic to these types of variables, in particular potential heterogeneity in the self-assessment of health across population

groups. This factor may bias the measurement of social disparities in health, especially if members of a particular subgroup over- or understate their true health. Although evidence suggests biases in the self-assessment of health relating to socioeconomic conditions, there seems to be no evidence of bias in health inequality measures (31). At the same time, these variables have proven effective in capturing variations in health; in particular, self-assessed health has been shown to be a good predictor of mortality (22, 25).

Another potential limitation relates to the aforementioned different definitions in surveys of self-assessed health and inpatient days. Recall errors for long reference periods and telescoping effects for short reference periods on the measurement of several variables, such as expenditure and alcohol intake, have been documented (32–35). In the case of self-assessed health, a shorter recall period could produce through a telescoping effect a biased higher perception of bad health. However, when testing for differences in the mean values of this variable between 2000 (recall period: last year) and 2006 (recall period: today), a significant reduction in less-than-good health was found. If such bias is present, the actual decrease in less-than-good

health probably would have been larger. On the other hand, the analysis focuses on the extent to which variables are concentrated among income-related groups of individuals and not on mean values. Although the definition of variables does not match perfectly, they are sufficiently comparable in terms of the phenomena to be measured. Still, promoting more consistency in questions used in periodic surveys is desirable in order to eliminate this type of limitation.

An area for further research concerns the analysis of regional or state heterogeneity. Some authors have used the national average relationship between need and service utilization as a benchmark to assess inequalities observed at the provincial level (36). This analysis is relevant for decentralized health systems like Mexico's. This study introduced a variable that combines urban, rural, and geographic areas; in some cases, this variable makes important contributions to inequity. Since NHNS 2011/2012 is representative at the state level, this issue could be explored.

Methods to measure inequity are evolving. Recent academic developments suggest that future research in this area could benefit from applying alternative approaches to solve some limitations of

the CI and improve the measurement of socioeconomic health inequity (37, 38).

Income-related inequalities and inequities in health and health care in Mexico remain, and health insurance contributes to such disparities. Increasing access to health insurance for the population not covered by traditional social security schemes can potentially help to redress inequities in health care utilization. Evidence on income-related inequalities is valuable for policy making and supplements evaluation of health system performance. Integrating such an analysis as part of periodic national household surveys would provide a more sustainable basis to monitor the evolution of inequalities.

Conflict of interest. None.

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RESUMEN

Desigualdades e inequidades en la salud y en la utilización de la atención sanitaria relacionadas con los ingresos en México, 2000-2006

Objetivo. Medir las desigualdades y las inequidades en la salud y en la utilización de la atención sanitaria relacionadas con los ingresos en México.

Métodos. Se emplearon los datos de la Encuesta Nacional de Salud del año 2000 y la Encuesta Nacional de Salud y Nutrición de 2006 para calcular los índices de concentración de las variables de resultados en salud y de utilización de la atención sanitaria antes y después de su estandarización. El estudio analizó 110 460 individuos de 18 años o más de la primera encuesta y 124 149 de la segunda. Las variables de estado de salud consideradas fueron la salud autoevaluada, las limitaciones físicas y la enfermedad crónica. La utilización de la atención sanitaria incluyó las visitas curativas y la atención odontológica, hospitalaria y preventiva. Los individuos se agruparon según tres medidas de estándar de vida: ingresos, riqueza o patrimonio y gasto del hogar. Otras variables independientes fueron área de residencia, región geográfica, educación, empleo, grupo étnico y seguro de salud. El análisis de descomposición permitió estimar las contribuciones de las variables independientes a la distribución de la atención sanitaria entre los individuos.

Resultados. La población en peor situación económica refirió un peor nivel de salud autoevaluada y mayores limitaciones físicas, mientras que los individuos en mejor situación informaron más enfermedades crónicas y tuvieron más consultas curativas y hospitalizaciones. No se observaron cambios significativos en estos resultados entre 2000 y 2006. Según la evidencia disponible, el nivel de vida, el seguro de salud y la educación contribuyen en gran parte a la distribución desigual de la atención sanitaria.

Conclusiones. A pesar de las mejoras en los patrones de utilización de la atención sanitaria, persisten inequidades en la salud y en la atención sanitaria relacionadas con los ingresos. La equidad en salud sigue siendo un reto para México.
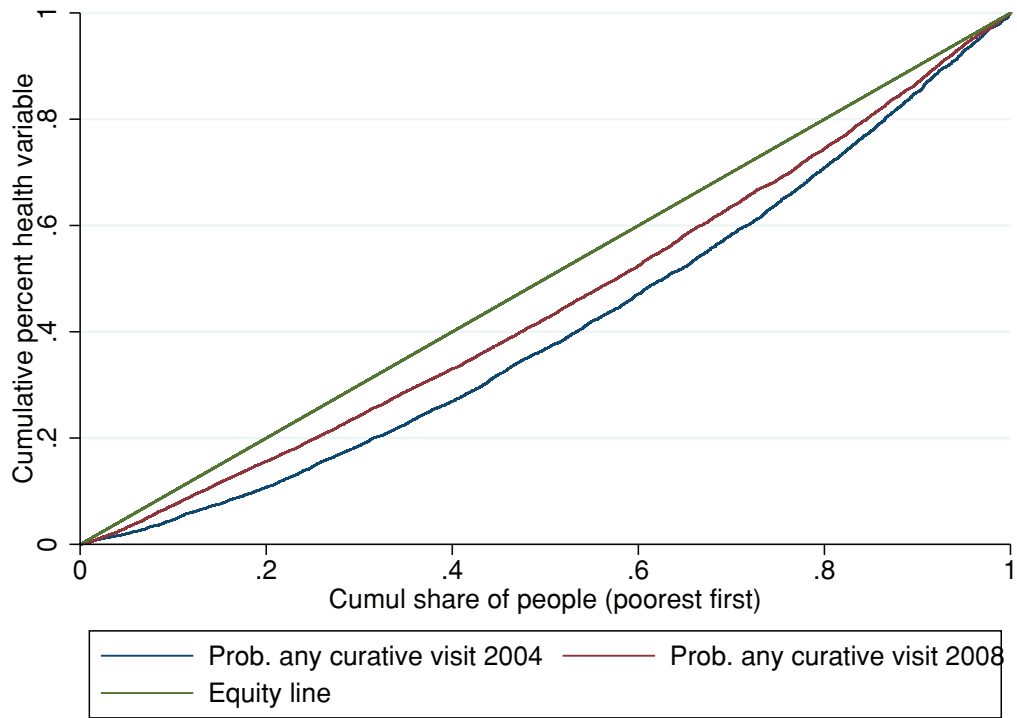
Palabras clave Equidad; equidad en salud; inequidad social; sistemas de salud; política de salud; México.

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