Patterns of Medical Employment: A Survey of Imbalances in Urban Mexico

Julio Frenk, MD, MPH, PhD, Javier Alagon, DPhil, Gustavo Nigenda, MA, Alejandro Muñoz-delRío, BSc, Cecilia Robledo, BA, Luis A. Vázquez-Segovia, BA, and Catalin Ramírez-Cuadra, BA

Abstract

This article quantifies the magnitude and correlates of the major imbalances affecting the employment of physicians in the urban areas of Mexico. Since the early 1970s the country has experienced a rapid increase in the supply of doctors, which its health system was unable to absorb fully. In 1986, we conducted a survey in the 16 most important cities based on a probability sample of households where someone with an MD degree lived. A total of 604 physicians were interviewed for a response rate of 97 percent.

The unemployment rate was 7 percent of potentially active physicians; 11 percent held a nonmedical job, and another 11 percent exhibited low productivity and/or income. All in all, we project that 23,500 physicians in these cities were either unemployed or underemployed.

This medical employment pattern was analyzed against five independent variables: generation (i.e. the year in which the physician started medical school), gender, social origin, medical school quality, and specialty. Apart from generation, type of specialty exhibited the strongest correlation with the employment situation of a physician.

The results suggest that higher education and health care in Mexico may be producing rather than correcting social inequalities. Policy alternatives are discussed to restore a balance between the training of physicians, their gainful employment, and the health needs of the population.

Introduction

Among the many paradoxes of contemporary health systems probably none is so indicative of failure as the coexistence of underemployed physicians with underserved populations. This is the situation that today prevails in many countries of the world. For reasons that are not yet fully understood, a wide variety of nations, with very different levels of economic development and political structures, experienced during the last decades substantial increases in the supply of physicians, which the health system was often unable to absorb. The result has been the appearance of manpower imbalances that have assumed manifold manifestations.

In order to contribute to our understanding of the dynamics of medical employment, the present article analyzes the case of physicians in the urban areas of Mexico. Apart from the intrinsic interest of the subject, the Mexican health care system offers the analytical advantage of encompassing virtually all organizational forms of medical work, from independent practice to salaried jobs in the public sector; extreme forms of imbalances such as underemployment and unemployment exist. The conceptual framework and specific methodology we have developed may be relevant to other nations.

Overview: The Medical Labor Market in Mexico

From the establishment of the first course of medicine in 1578 until the beginning of the 1970s, Mexico suffered from a chronic shortage of physicians. Starting in 1967, however, the medical education system experienced an explosive expansion. Student enrollment peaked in 1980 at 93,365, compared to 28,731 in 1970; the number of medical schools reached 56 in 1979, up from 27 in 1970. The underlying causes for this growth process are very complex and have been analyzed in detail elsewhere. Briefly, two factors appear to be crucial: the increased demand for higher education from the middle classes, and the effects of the economic crisis that has intermittently affected Mexico since the mid-1970s and has channeled a large number of young people who cannot find employment in the general labor market into the universities.

The economic crisis also produced a reduced rate of growth of medical services, which made it impossible for the health care system to absorb the increased number of graduates. As a consequence, new phenomena of underemployment and unemployment have emerged. The Mexican health care system, which has a national character, is similar to the American one in this regard; it has been driven to an extent by the economic conditions. The Mexican economy is considered one of the most dynamic in Latin America, with a large middle class and a growing market for health services.

Address reprint requests to Dr. Julio Frenk, Director, National Institute of Public Health, Apartado Postal 222, Admon. De Correos No. 1, 62000 Cozumel, Mexico. Dr. A. Alagon is a Researcher with the Autonomous Technological Institute of Mexico; Nigenda is Head, and co-authors Muñoz-delRío, Robledo, Vázquez-Segovia, and Ramírez-Cuadra are researchers, all with the Department of Research on Human Resources for Health, Center for Public Health Research, National Institute of Public Health, Mexico. This paper, submitted to the Journal December 12, 1989, was revised and accepted for publication May 15, 1990.

Editor's Note: See also related editorial p 13 this issue.

Table 1—Recent Evolution of Physician Supply in Mexico

<table>
<thead>
<tr>
<th>Year</th>
<th>Absolute Number of Physicians</th>
<th>Physicians per 100,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>20,590</td>
<td>57</td>
</tr>
<tr>
<td>1970</td>
<td>34,107</td>
<td>71</td>
</tr>
<tr>
<td>1985</td>
<td>120,000</td>
<td>153</td>
</tr>
</tbody>
</table>

Sources:
- For 1960: Ref. 7
- For 1970: Ref. 6
- For 1985: Ref. 9

The table shows the evolution of the number of physicians in Mexico from 1960 to 1985. It indicates a significant increase in the number of physicians, with a peak of 120,000 in 1985.

Methods

Data Source

Because the purpose of the study was to analyze the full range of employment possibilities, including the lack of a stable job, it was obvious that we could not draw a sample of traditional sites of medical work, such as offices and hospitals. Instead, we needed a representative sample of households where those holding a medical degree lived.

Such a sample was obtained from the 41,000 households that are visited every three months by the National Survey of Urban Employment, which is the official source of most labor statistics in Mexico and is carried out by the National Institute of Statistics, Geography, and Informatics. This survey covers the 12 metropolitan areas in the country and the four most important cities on the United States-Mexico border. It is a rotating panel survey, based on a stratified, multistage sample of households, where 88,050 people, representing 14,529,826 inhabitants ages 20 years or more, are interviewed. The validity and reliability of this survey have been extensively documented throughout the 17 years during which it has been in existence. Further details can be consulted in official publications on the survey.** Although this is a complex probability sample, physicians constitute a relatively rare element in it; under these circumstances we assumed that they behave as a simple random sample, so that no weighting of the data is necessary in the analysis.13

In the last trimester of 1985, 620 physicians were identified during the regular round of the National Survey of Urban Employment. Shortly thereafter, these doctors were reinterviewed in face-to-face sessions by professional interviewers, who used a questionnaire specifically designed for our study at the National Institute of Public Health. The entire process of interviewing and coding was supervised by researchers from this institute.

Complete questionnaires were obtained from 604 physicians, for an overall response rate of 97 percent, which ranged from 94 percent in one city to 100 percent in eight cities. In Mexico future physicians are required, after four years of medical school, to complete a one-year internship in a hospital and one additional year of "social service" in a rural area before receiving their medical degrees. The sample included these interns and social service practitioners in addition to physicians who had already obtained their degrees. However, the present analysis is based on the 491 physicians who were active in the labor market. The "inactive" doctors excluded from the analysis comprise retired persons, as well as interns and social service practitioners, who do not demand employment since they are assured those positions in order to comply with the requirements for a medical degree.

Variables

Social Origin—This reflects not only the general standard of living that the physician enjoyed while he/she was growing up, but also the access to networks of relationships that may create future job opportunities. Social origin was measured through an index based on the occupation of the person who supported the physician during his/her years as a medical student (typically the father). The resulting categories were: low (e.g. manual workers, small-scale merchants), middle (e.g. technicians, teachers, clerical workers, foremen, sales agents, mid-sized merchants), and high (e.g. owners of industry, senior managers, senior government officials, professionals). In order to validate this index, we used the 1980 Census data to rank occupations along an income scale that was divided into three equal parts. The data on fathers’ occupations from our survey were then matched to the Census occupation information. There was 100 percent match between our three categories of social origin and the three segments of the income scale.

Gender—Apart from its effects on productivity and job stability, gender is thought to be associated with differential access to occupational positions even af-

ter educational opportunities have become more equal among women and men.

**Medical School Quality**—It cannot be assumed that attending a medical school represents the same educational experience for everyone. The only objective indicator of quality available for all medical schools in Mexico is a standard examination applied to graduates at the end of their studies in order to select those who will be admitted into a residency. However, this standard test has only been in existence since the mid-1970s, so that no comparable quantitative data are available for physicians who studied earlier. For this reason, we measured quality through an opinion poll from 30 experts in medical education selected to represent four groups: authorities from medical schools, decision makers from the main health institutions in charge of medical manpower, faculty members from medical schools, and academics who have studied various aspects of medical education. Experts were given a standardized schedule to rate the quality of schools, taking into consideration elements of structure (e.g., number and qualifications of the faculty, adequacy of the facilities), process (e.g., type of curriculum, educational methodology), and outcomes (e.g., competence of graduates, success in finding jobs). They were asked to provide separate evaluations for two time periods: before and after 1970, since it cannot be assumed that the quality of the schools existing before 1970 has remained constant. Evaluations for each school in each time period were made on a scale from 1 to 4, and the scores were weighted according to the amount of information that the experts declared themselves to have about each assessment. The quality index was the average of these weighted scores. Its distribution revealed two marked cleavages, which were used as cutoff points to stratify schools into three categories of quality: inadequate, average, and good. The validity of the quality index for schools after 1971 was checked by correlating it with the average scores of graduates from each school on the standard examination for admission into residencies. The Pearson’s r correlation was 0.76, which was considered satisfactory.

**Type of Specialty**—This variable reflects the differential access to opportunities for postgraduate education. It also indicates the intensity of specialization, as measured through the following categories: no specialty, family medicine, basic specialties (i.e., internal medicine, pediatrics, gynecology-obstetrics, and general surgery), and subspecialties. Even though in Mexico the length of postgraduate training is similar for family medicine and for the basic specialties, the former is considered to represent a lower degree of specialization, since family practitioners are trained to deal with all age and sex groups. In addition, the practice settings are also different. Family medicine emerged during the 1970s as a residency program aimed at satisfying the requirements for first-contact care at the social security and other public-sector organizations. Thus, family doctors practice almost exclusively in ambulatory settings, while basic specialists also work in general hospitals.

**Generation**—To consider the influence of contextual variables, such as the situation of the medical labor market, we measured a variable called generation, which refers to the year in which the physician entered medical school, whether before or after 1971, the year when the policy of massive access to higher education was fully implemented. In addition to reflecting the environment to which the physician was exposed during his/her formative years, generation is very highly correlated (Pearson’s r = 0.97) with age. In turn, age is related to experience, productivity, and exposure to employment opportunities, all of which affect the success of a physician in obtaining a desirable job.

Even though the data come from a cross-sectional survey, the fact that there is an unambiguous chronological order among the variables allows us to adopt a “biographical” view of medical employment. In this time order, three of our independent variables can be considered antecedent to the others, i.e., social origin, gender, and generation/age. In turn, attending a medical school occurs before postgraduate training to become a specialist. The final link in this chain, which represents the dependent variable, is medical employment.

**Dependent Variable**—We conceptualize the dependent variable as “medical employment pattern,” built through cluster analysis of physicians sharing similar job characteristics. The detailed statistical procedure has been described elsewhere.

The final variable summarizes the most relevant dimensions of employment: number of jobs; position (salaried or independent); occupational level (whether the job requires less skill than what the person was trained for, e.g., whether the physician performs a nonmedical job); productivity (measured by the number of patients seen and hours worked per week); income; and job stability. Obviously, the number of potential combinations is very large. Cluster analysis enabled us to ascertain the specific combinations that occur empirically. These combinations were grouped to form the dominant patterns, which turned out to be six:

1. **Unemployment**: This category was strictly defined to include those doctors who did nothing but search for a job or who had stopped looking for one because they had become discouraged.

2. **Qualitative Underemployment**: This pattern refers to physicians who worked outside medicine. Even if they may have had high productivity or income, the social investment in their medical education would have been underutilized. As it turned out, most of these jobs required a lower level of training than medical care.

3. **Quantitative Underemployment**: Our analysis identified a cluster formed by physicians who provided patient care, but did so under one or more negative circumstances suggesting that their work potential was severely underutilized. As shown in Table 2, doctors in this cluster saw very few patients (the mean for the cluster was 18.2 patients per week, compared to 66.1 among all other physicians in patient care), worked reduced hours (a mean of 31.9 hours, compared to 55.3 among the rest of physicians, with 60 percent of underemployed doctors working less than 35 hours per week), and/or earned a low income (54 percent made less than three minimum wages, compared to 18 percent among fully employed doctors). In addition, these physicians tended to have unstable working conditions, characterized by job insecurity and high turnover rates.

4. **Salaried Single Medical Employment**: This is a conventional pattern composed of doctors with one stable salaried job in a health care organization, most often in the public sector.

5. **Independent Single Medical Employment**: This cluster represents another conventional pattern, wherein physicians work full time in their own private practices. In terms of income, this was a more heterogeneous cluster than the previous one; as shown in Table 2, the percentages in the lower end of the distribution were similar among both clusters with single employment, but independent doctors exhibited a much higher proportion of high-income earners. Such heterogeneity also accounts for the smaller average produc-
Frenk, et al.

Activity, since competition probably forces some independent physicians into the lower end of the distribution.

6. Multiple Medical Employment: This last pattern included cases holding two or more medical positions, the majority of them with one salaried and one independent job. In the Mexican medical labor market, as in many other developing countries, such a dual pattern has been traditionally considered to be very desirable, since it allows the physician to combine the prestige of a position in a public hospital with the economic incentives of a private practice. The advantages of this situation can be appreciated in the productivity and income figures presented in Table 2.

Analysis

The purposes of the analysis were to measure the frequency of each medical employment pattern, to determine the links among the variables, and to compare the relative strength of each relationship. In order to achieve this last purpose, we used percentage differences, as well as two conventional measures of association for cross-tabulations, namely, Cramer’s V when the measurement level of the variables was nominal and Gamma when it was ordinal.16–18

### Results

Table 3 presents a set of cross-tabulations between pairs of variables. The marginal totals provide the frequency distribution of employment patterns, and the percentages can be interpreted as employment rates. Thus, the unemployment rate is 7 percent, while the global underemployment rate (quantitative and qualitative) is 22 percent. Projecting these proportions, we can infer from the population of active physicians in the 16 cities (81,024) that un- and underemployment affect approximately 23,500 doctors.

Moving to the correlates of this problem, Table 3 indicates that all the explanatory variables, except social origin, exhibit significant and fairly strong overall associations with employment pattern. Beyond these common characteristics, it is worthwhile to examine each cross-tabulation.

### Generation

Table 3 shows a marked increase in unemployment and underemployment from the oldest to the youngest group. Among those who do have a job, there is a shift from independent to salaried practice and from multiple to single employment. This variable reflects not only the intrinsic differences between the two generations, but also the different time spans that each group has been in the labor market. In addition, the sample may be biased for the older generation insofar as we only have the survivors. Nevertheless, the trends exhibited by our data are consistent

<table>
<thead>
<tr>
<th>Medical Employment Patterns Involving Patient Care</th>
<th>Productivity</th>
<th>Incomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean number of patients seen per week</td>
<td>mean number of hours worked per week</td>
<td>percentage earning less than 3 minimum wages</td>
</tr>
<tr>
<td>Salaried single employment</td>
<td>65.4</td>
<td>60.1</td>
</tr>
<tr>
<td>Independent single employment</td>
<td>27.9</td>
<td>36.7</td>
</tr>
<tr>
<td>Multiple employment</td>
<td>83.8</td>
<td>57.1</td>
</tr>
</tbody>
</table>

### Table 2—Average Productivity and Income for Medical Employment Patterns Involving Patient Care

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Generation</th>
<th>Gender</th>
<th>Social Origin</th>
<th>Medical School Quality</th>
<th>Type of Specialty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1920–70</td>
<td>1971–82</td>
<td>Male</td>
<td>Female</td>
<td>Low</td>
<td>Middle</td>
</tr>
<tr>
<td>Salaried single employment</td>
<td>27</td>
<td>41</td>
<td>32</td>
<td>45</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Independent single employment</td>
<td>16</td>
<td>7</td>
<td>13</td>
<td>4</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Multiple employment</td>
<td>42</td>
<td>10</td>
<td>30</td>
<td>9</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Quantitative underemployment</td>
<td>6</td>
<td>15</td>
<td>9</td>
<td>15</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Qualitative underemployment</td>
<td>7</td>
<td>14</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Unemployment</td>
<td>2</td>
<td>13</td>
<td>5</td>
<td>17</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>N</td>
<td>235</td>
<td>256</td>
<td>391</td>
<td>100</td>
<td>197</td>
<td>180</td>
</tr>
<tr>
<td>X²</td>
<td>98.5</td>
<td>40.8</td>
<td>16.9</td>
<td>65.4</td>
<td>159.4</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0759</td>
<td>0.0001</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Cramer’s V</td>
<td>0.45</td>
<td>0.29</td>
<td>0.13</td>
<td>0.26</td>
<td>0.32</td>
<td></td>
</tr>
</tbody>
</table>
with existing information about the supply and demand of physician manpower.

**Gender**

There is an important connection between generation and gender, since the proportion of women among physicians was 14 percent in the 1920–70 generation and 26 percent in 1971–86. As can be seen in Table 3, the proportion of unemployed women is three times higher than the corresponding figure for men. Although salaried single employment is the most important pattern for both groups, the second most important pattern is multiple employment among men and unemployment among women.

**Social Origin**

There is a tendency for multiple medical employment to be more frequent with higher social origin. Conversely, salaried single employment is not as important in the high group as it is in the other two, and unemployment is most frequent among physicians from the lowest socioeconomic background.

**Medical School Quality**

There is a marked descending gradient for the least desirable patterns as quality increases: 47 percent of physicians who studied at an inadequate school are unemployed, compared to 24 percent and 17 percent of graduates from average and good schools, respectively. It is also worth noting that higher quality is associated with increasing proportions of multiple medical employment. This is the dominant pattern for physicians from the better schools, whereas salaried single employment is the most common pattern for inadequate and average schools.

**Type of Specialty**

Lack of postgraduate training greatly increases the chances of unemployment: almost half of the physicians without a specialty are located in one of these categories. The practice of family medicine has become the prototype of medical work based on a single salary at the service of the state, with 83 percent of family doctors exhibiting such a pattern. The traditional pattern of multiple employment is now reserved for physicians with a basic specialty or a subspecialty, among whom unemployment is very rare.

Some of the effects shown in Table 3 could be indirect, as mediated by chronologically subsequent variables. In the case of gender, there were no significant differences between men and women in the quality of the medical school attended, but their respective opportunities for postgraduate training presented sharp contrasts. Thus, when specialty is examined by sex, we find that more than two-thirds of female doctors have no specialty, compared to less than half of their male colleagues (Table 4). Among those who do complete a residency, the proportions of men and women are about equal in family medicine. However, males dominate in the basic specialties and even more so in the subspecialties, where their proportion is twice that of females.

Social origin could also affect employment indirectly, through a relationship that is mediated by medical school. As shown in Table 5, the association between social origin and medical school is fairly strong. Thus, 40 percent of physicians from the lower social origin attended an inadequate medical school, compared with 44 percent of doctors from the higher social origin who went to a good school.

Part of the effect of medical school quality on employment may be mediated by type of specialty, since entrance to a residency is a competitive process that is bound to be affected by the quality of previous education. Table 6 demonstrates that there is a strong association between medical school quality and type of specialty. The likelihood of having no specialty increases consistently as quality decreases. Thus, the proportion of general practitioners is 1.4 and 2.2 times larger among graduates of inadequate schools than among doctors who studied at average or good schools, respectively. In contrast, good schools concentrate the highest proportions of basic specialists and subspecialists. In fact, we can consider the high degree of consistency of this association as a confirmation of the validity of our measure of school quality.

**Discussion**

The results of this study point to a series of imbalances, inadequacies, and inequities that characterize the medical labor market in Mexico. First of all, the heavy burden on Mexican society: almost one-third of all physicians living in the 16 major cities are unemployed or underemployed. Because these extreme forms of imbalance are likely to be concentrated in the large cities, the situation probably approaches the total for the whole country. In any event, the figure of 23,500 unemployed and underemployed physicians acquires its precise meaning when one considers that in 1986, the year when our survey was conducted, 9.3 million people, representing 11 percent of the Mexican population, did not have ready access to health services.

Not all types of imbalance produce the same social impact. Unemployment and qualitative underemployment represent a waste of resources for society and a source of frustration for those doctors who have to work outside medicine or cannot find a job at all. Paradoxically, even those who are unemployed seem unwilling to serve in deprived rural areas, indicating that they would rather remain in the cities than be fully employed as physicians where their services are most needed.

While unemployment and qualitative underemployment are undoubtedly severe problems, quantitative underemployment opens up a new perspective on physician oversupply. In this case, doctors still provide patient care, but do so at low levels of productivity. It is not unreasonable to assume that such doctors may represent a potential risk to their patients. Our analysis indicates that physicians with
low output tend to be young, have no postgraduate training, and often work in independent practices without any supervision. Under these circumstances, the quality of care may suffer through two mechanisms: first, doctors who see few patients may be unable to build up enough clinical experience; second, there may be a tendency to overprescribe medical procedures in order to derive a living from those few patients. The extent to which quantitative underemployment of doctors may represent a health risk is a subject for future research.

The appearance of imbalances also suggests that the medical labor market is experiencing a process of segmentation. Apart from those physicians who are out of a medical job, there seem to be two major segments. The first one is characterized by reasonable productivity, relatively sufficient earnings, and stable employment conditions through a salaried position in government, a conventional private practice, or both. Diverging from the mainstream, a substantial number of doctors have entered into a marginal segment of the market, which is characterized by low productivity, insufficient earnings, and occupational instability. The segmentation process even extends to those who have attained relatively good positions, as illustrated by the fact that the traditional prestigious pattern of combining a salaried position in the public sector with a private practice is now dominated by physicians with a basic specialty or a subspecialty; in contrast, family doctors exemplify a new kind of medical functionary, since the vast majority of them hold their only job at the service of the government.

These cleavages in the medical profession reflect a broader process leading the medical education and health care systems to reproduce, rather than ameliorate, pre-existing social inequalities. Such a process begins with the channeling of students from different social origins to medical schools of varying quality. Indeed, the data reported here have demonstrated that there is a substantial degree of social stratification among medical schools, thus corroborating the findings from a previous study. In turn, the quality of the medical school affects the probability of doing a specialty residency, which has a direct effect on employment. To complete this logic, we can assume that underemployed physicians are more likely to care for people from the lower social classes. There are reasons to believe that the quality of the care provided by these physicians is inadequate. In addition, there is empirical evidence that the distribution of the quality of care in Mexico is highly stratified by social class. A circle is therefore closed: disadvantaged people will attend substandard medical schools and end up providing inferior care for other disadvantaged people. Obviously, this is not a deterministic but a probabilistic sequence of events. Indeed, we are not dealing with a rigid social structure that prescribes these patterns of behavior, but with one that tends to reproduce inequality. Although many individuals can and do escape from this vicious cycle, its existence seriously threatens the legitimacy of higher education and of health care.

The distribution of employment patterns by gender also exhibits important elements of inequality. In contrast to social origin, there is no stratification of medical schools by gender. Yet disparities are found in the opportunities for postgraduate residency, as shown by our data. Most of the substantial gender differentials in employment patterns can be attributed to the mediating effect of access to residencies. Such differentials acquire additional importance when one considers that the proportion of women in the medical profession is increasing. For example, by 1985 women constituted half the entering class at the most important medical school in the country, up from 38 percent in 1979.

Despite their many sobering implications, our findings still leave ample room for policy interventions to correct imbalances. Many of the effects on employment appear to be mediated by the quality of medical schools and the opportunities for postgraduate training. Thus, actions can be implemented to improve inadequate schools and to make admissions dependent on academic potential only and not on the economic status of the student's family. Similarly, residency programs can adopt affirmative action measures that give women equal opportunities based solely on qualifications. In particular, it seems necessary to provide support services that will make the pursuit of a medical career compatible with other social roles.

With respect to those physicians who are already underemployed, it would seem urgent to adopt continuing education programs that may compensate deficiencies in previous training and encourage those physicians to serve in rural areas. Such educational endeavors would have to be complemented by specific incentives, both in monetary terms and in opportunities for future career advancement. The ultimate obligation of protecting the health of the population also makes it necessary to consider mechanisms for the periodic certification of medical competence.

Finally, current effects to restrict the growth of medical schools must continue. Indeed, there can be little doubt that an overabundance of physicians has dysfunctional consequences not only for the medical profession itself, but also for the health system as a whole, including the users of services.

Above all, countries like Mexico must make explicit efforts to redress the inequalities that still mar the systems of higher education and health care. The French sociologist Raymond Boudon spoke of "perverse effects" as an analytic category that accounts for the actual functioning of many social institutions. Higher education and health care, two of the fundamental vehicles for promoting equity, are at risk of falling into the perverse effect of reproducing social inequalities. Unless they truly fulfill their role of ameliorating the negative consequences of poverty, they may themselves end up being impoverished institutions. The challenge, in essence, is to harmonize the legitimate aspirations for social advance-
Acknowledgments

We are grateful to the following people: Begoña Artalotúa and Alfredo Hernández for their help in the analysis of the data; Armando Arredondo for his participation in the field work; José Luis Bobadilla for his advice on the definition of the research strategy; Luis Durán-Arenas for his contributions to the interpretation of the findings; Lilia Durán and José Becerra for their assistance in constructing the employment patterns; Héctor Hernández-Llamas, Miguel Cervera, Mercedes Pedrero, and Edmundo Berumen for their orientation regarding the survey design; Ronald Kessler, Rashid Bashshur, and Carlos Santos-Burgos for their comments on the manuscript. The National Institute of Statistics, Geography, and Informatics generously gave us access to the primary source of data for our study. This research was funded in part with grants from the Pan American Health Organization, the National Council for Science and Technology of Mexico, and the Mexican Foundation for Health. While we greatly appreciate these various sources of support, the content of this article remains the sole responsibility of the authors.

References