

Trends in Medical Employment: Persistent Imbalances in Urban Mexico

ABSTRACT

Objectives. This study examined the extreme medical unemployment and underemployment in the urban areas of Mexico. The conceptual and methodological approach may be relevant to many countries that have experienced substantial increases in the supply of physicians during the last decades.

Methods. On the basis of 2 surveys carried out in 1986 and 1993, the study analyzed the performance of physicians in the labor market as a function of ascription variables (social origin and gender), achievement variables (quality of medical education and specialty studies), and contextual variables (educational generation).

Results. The study reveals, despite some improvement, persistently high levels of open unemployment, qualitative underemployment (i.e., work in activities completely outside of medicine), and quantitative underemployment (i.e., work in medical activities but with very low levels of productivity and remuneration). The growing proportion of female doctors presents new challenges, because they are more likely than men to be unemployed and underemployed.

Conclusions. While corrective policies can have a positive impact, it is clear that decisions regarding physician supply must be carefully considered, because they have long-lasting effects. An area deserving special attention is the improvement of professional opportunities for female doctors. (*Am J Public Health*. 1999;89:1054-1058)

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During the last quarter century, the social institution of medicine has experienced a series of imbalances that threaten its potential contribution to the solution of health problems. In many countries, such imbalances have found their extreme expression in the coexistence of doctors without employment and populations without medical service.^{1,2} Mexico is one of those countries. As of 1995, 11% of the population still lacked access even to basic health care,³ while thousands of physicians were unemployed or underemployed.

In this context, 2 national surveys of medical employment were carried out in support of research and policy-making. The results of the 1986 survey have been reported in the *Journal*⁴; this article focuses on the 1993 survey. Having 2 points in time makes it possible to ascertain trends. Furthermore, it is possible to consider the effects of policies to control the supply of physicians that were implemented between the surveys. This case study can offer lessons to other countries struggling with similar problems.

The Context: Crises and Policies

After 4 centuries of slow growth, medical education in Mexico began a process of uncontrolled expansion in the early 1970s. This was fueled by 2 mechanisms, establishment of new schools and increased enrollments in existing ones. The number of medical schools more than doubled in the 1970s, from 27 in 1970 to 56 in 1979. Between 1970 and 1980, student enrollment more than tripled, and the annual number of new graduates entering the job market increased more than 5-fold. The result was a sharp increase in the number of physicians per 100 000 persons, from 57 in 1960 to 153 in 1985 (Figure 1).⁵

Because of Mexico's huge burden of unmet health needs, the expansion in physi-

cian supply might not have been a problem in itself. Yet, recurrent economic crises meant that the health care system could not absorb all of the new graduates.

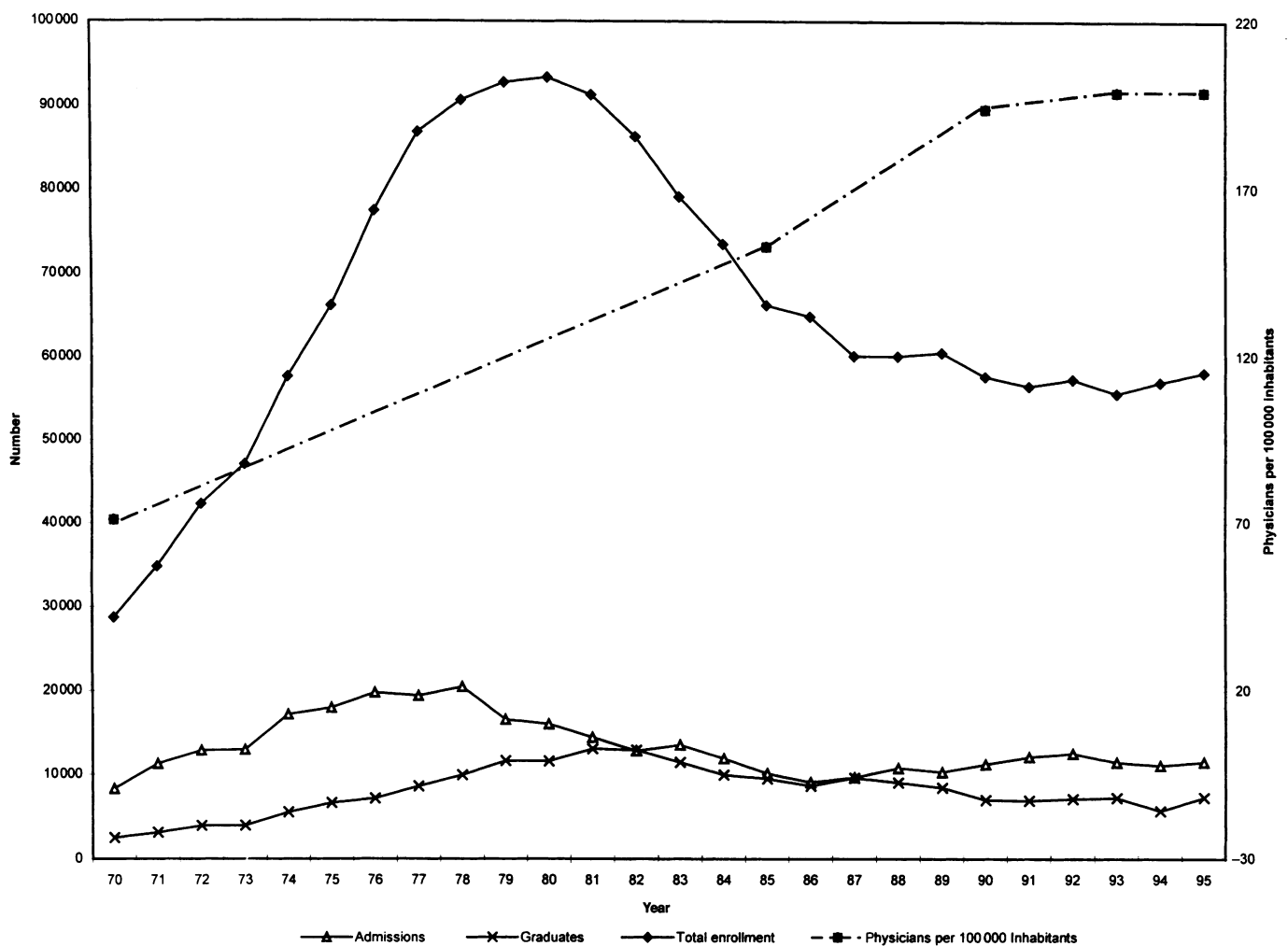
Throughout the critical years of rapid growth in supply, the number of residency positions, an important source of employment and training for new graduates, remained constant. By 1983, approximately 16 100 of Mexico's recent medical school graduates had to compete, through a uniform national examination, for only 2240 residency slots. The alternative for those who could not get into a residency was to look for a scarce job as a general practitioner. By 1984, there was 1 opening in a health care organization for every 4 graduates. Furthermore, the increased supply of doctors did not translate into a better geographical distribution. The Mexican average in 1990 of 1 physician for 516 persons hides wide variations, from 217 in Mexico City to 1370 in the poor state of Chiapas.⁶

The combination of an increased supply of new doctors, limited growth in the health care system, and unequal distribution led, by the mid-1980s, to imbalances such as widespread physician unemployment and underemployment in the major cities.⁴ As a result, the ministries of health and education, along with the principal universities,

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Note. Data were derived from the following sources: for medical student population, official statistics from the National Association of Universities and Higher Education Institutions, Mexico; for physician supply in 1970 and 1985, Frenk et al.⁴; for physician supply in 1990, Frenk⁷; for physician supply in 1993, National Survey of Medical Employment; and for physician supply in 1995, population count by the National Institute of Statistics, Geography, and Informatics and statistical reports from the Ministry of Health of Mexico. Data on number of physicians per 100 000 inhabitants are based on information for the years 1970, 1985, 1990, 1993, and 1995. The other 3 series are based on annual data.

FIGURE 1—Evolution of medical student population and of physician supply: Mexico, 1970–1995.

launched a major policy initiative through the establishment in 1983 of a joint planning body.⁷ One of its most urgent mandates was to adjust the production of physicians by medical schools to the absorptive capabilities of the health care system. The containment measures included severely restricting the opening of new medical schools. Admissions were halved by 1986, and by 1990 the number of new graduates stabilized at around 7000 per year. Although the supply of doctors continued to grow, it did so at a reduced rate (Figure 1).

By the end of the 1980s and the beginning of the 1990s, economic recovery had led to growth in health care institutions. Whereas

new positions in the public sector fell 2% between 1981 and 1982, they grew 10% between 1990 and 1992.⁸ Furthermore, the prospects for getting into a residency improved sharply, with the proportion of applicants admitted to a residency position increasing from 14% of applicants in 1983 to 45% in 1993.

Although these indicators suggest improvement, the explosive growth of the 1970s and early 1980s had created a momentum in the supply of physicians. It therefore became important to assess the impact of the containment policies by repeating the survey in 1993. This assessment was especially important because such policies were leading

some officials to fear an impending shortage of doctors and to propose a new expansion of medical education.

Methods

Data

The 1993 survey basically replicated the 1986 survey, described in our previous report.⁴ In both, the questionnaire and sample were designed to study the full range of employment and educational options of physicians. Both surveys were based on a representative sample of households including at least

TABLE 1—Average Productivity and Income for Medical Employment Patterns Involving Patient Care: Mexico, 1993

Medical Employment Involving Patient Care	Productivity		Income	
	Mean No. of Patients Seen per Week	Mean No. of Hours Worked per Week	Earning Less Than 3 Minimum Wages, %	Earning More Than 10 Minimum Wages, %
Salaried single employment	94	41	7	17
Independent single employment	47	46	11	52
Multiple employment	95	53	1	68
Quantitative underemployment	16	21	29	12

Note. Figures are restricted to physicians who see patients.

1 member with a medical degree. The sample came from the National Survey of Urban Employment, which is carried out by the statistical agency of Mexico and has been extensively tested over the past 20 years⁹; it is a quarterly household survey with a stratified, multistage sample representative of the urban population. The number of covered cities has recently been expanded to 34. (For 1993, we conducted the analysis on both the entire sample of 34 cities and the 16 covered in 1986. The distributions and relationships were almost identical. Therefore, the results reported in this article are based on the total sample, without loss of comparability to the results based on data from 1986.)

Physicians identified in the 1993 and 1986 surveys were reinterviewed in face-to-face sessions by professional interviewers. The response rates were 97% in 1986 and 96% in 1993. The present analysis is based on responses from the 468 physicians from the 1986 survey and the 1073 from the 1993 survey who were active in the labor market and younger than 65 years.

Variables

Performance in the labor market can be a function of ascription (attributes that cannot be modified, such as gender and social origin) or attainment (qualities acquired by deliberate effort, especially through training). There may be interactions between these 2 groups of variables. Social origin, for example, may have an effect on employment, but the effect could be mediated by an attainment variable such as educational experience due to medical school quality. Both types of variables exert their effects in a specific labor market context.

These considerations guided the selection of variables, which were explained in the previous article.⁴ Thus, the independent variables can be classified as follows.

Contextual variable. The *generation* variable is an indirect indicator of context because it refers to the year in which a physician entered medical school. Hence, this variable reflects the environment in which the

future doctor pursued his or her studies. Generation was categorized according to broad periods that mark the evolution of the medical labor market in Mexico: up to 1970, just before the massive supply expansion; 1971 to 1980, when such expansion took place; and 1981 to 1988, when the policy reorientation toward supply containment began in earnest. This variable also reflects the length of time that an individual has been participating in the labor market.

Ascription variables. These variables include *gender* and *social origin*. The latter is an index based on the occupation of the person who supported the physician during his or her years as a medical student.

Attainment variables. Educational achievement refers to *medical school quality* and *type of medical specialty*. Because uniform instruments to ascertain the many dimensions of quality are not available in Mexico, we had to rely, in both surveys, on an opinion poll of medical education experts. For the first 2 generations of physicians in the 1993 survey, we applied the same scores that were obtained in the 1986 study (as explained in the earlier article).⁴ For the most recent generation, we repeated the polling methodology. We validated the resulting quality index by correlating it with the average score of graduates from each school on the uniform residency entrance examination. The Pearson correlation coefficient was 0.73, which was very similar to the one obtained in 1986, and this value was considered satisfactory.

Type of specialty is an ordinal variable indicating intensity of specialization: no specialty, family medicine, the basic specialties (i.e., internal medicine, pediatrics, gynecology-obstetrics, and general surgery), or subspecialties. Within the dominant paradigm of medical work,¹⁰ increased levels of specialization require growing investments in training and determine access to desirable jobs.

Dependent variable. Performance in the labor market is a multidimensional construct conceptualized here as *medical employment*

pattern. This is a complex variable that was built through cluster analysis of physicians sharing job characteristics. To ensure comparability, we applied the combinations developed from analysis of the 1986 data. The resulting dominant patterns were unemployment (only searching for a job), qualitative underemployment (holding a nonmedical job), quantitative underemployment (providing patient care but with very low productivity and income, as documented in Table 1), salaried single medical employment (commonly in the public sector), independent single medical employment (mostly in solo, fee-for-service practice), and multiple medical employment (having 2 or more jobs as a physician, usually 1 salaried and 1 independent job, which in the Mexican medical labor market is considered the most desirable pattern).

Analytic Strategy

The objectives were to document changes in the relative frequencies of medical employment patterns so as to evaluate the impact of earlier policy initiatives and ascertain the correlates of the employment situation of physicians. Our research design had the advantage that there was a time order. Ascription and contextual variables preceded attainment variables, which in turn preceded the dependent variable. Hence, it was possible to follow the life course of a physician even though the data were cross sectional. In our earlier article we considered the relationships observed in 1986⁴; here we compare surveys.

Results

Unemployment and underemployment declined between 1986 and 1993, reflecting the reductions in physician supply and the growth of the medical care system (Table 2). In 1986, 30% of economically active physicians younger than 65 years were unemployed or underemployed, as compared with 16% in 1993. Most of the increase in full employment

TABLE 2—Medical Employment Patterns: Mexico, 1986 and 1993

Medical Employment Involving Patient Care	Year			
	1986		1993	
	%	No.	%	No.
Salaried single employment	36	168	38	408
Independent single employment	10	46	13	139
Multiple employment	25	117	33	358
Quantitative underemployment	11	50	6	62
Qualitative underemployment	11	50	7	70
Unemployment	8	37	3	36
Total	100	468	100	1073

Note. For both years, only physicians under 65 years are included. The 1986 survey was carried out in 16 cities. The 1993 survey was carried out in 34 cities, but the findings are similar if the analysis is restricted to the same 16 cities as in the 1986 sample.

of physicians occurred in the category of multiple employment, which went from representing one quarter to one third of doctors. This could reflect a growing importance of the private sector as a provider of medical care in Mexico. Despite the improvement, there were still approximately 18 900 unemployed or underemployed doctors aged 23 to 64 years in urban Mexico in 1993.

The significance, direction, and strength of most of the associations among variables were similar to the ones found in 1986 (Table 3). With respect to *generation*, there was a marked concentration of unemployment among the physicians who had entered the labor market most recently. The rate of qualitative underemployment was high among members of the generation who began their studies during the most critical years of supply expansion (i.e., 1971–1980). Among fully employed physicians, recent

graduates were concentrated in salaried positions.

With respect to *gender*, we found again, as in 1986, that women were at an occupational disadvantage relative to men. Unemployment was 4 times more common among female than male physicians. Quantitative unemployment was 3 times more common, with women tending to work shorter hours and to earn lower incomes than men. Among women who were fully employed, the most common pattern was salaried single employment, with much smaller proportions working in independent practice or holding 2 jobs.

These gender differentials were related to the fact that fewer women than men entered postgraduate training. More than 60% of female doctors had no specialty, as compared with 34% of male doctors. At the other extreme, men were twice as likely as

women to have a subspecialty. The importance of these results is underscored by the growing proportion of women in medicine. Women constituted 51% of physicians from the youngest generation but only 15% from the oldest one.

Of the independent variables included in Table 3, *social origin* was the only variable that did not have a significant association with employment pattern. Still, there might have been an indirect effect that was mediated by medical school. This possibility was explored in the 1986 study, and such an indirect effect was indeed found; medical schools were clearly stratified according to the social origin of their students.⁴ In the 1993 survey, this relationship was considerably weaker. The main reason is that social class differentials have practically disappeared in terms of access to schools of good quality. Nevertheless, such differentials are still quite marked for schools of inadequate quality.

In turn, *medical school quality* was associated with employment pattern. Physicians who studied in poor schools were more likely to be unemployed or salaried and less likely to have multiple employment.

Finally, *type of specialty* has an important influence on labor market performance. One of every 3 general practitioners was unemployed or underemployed, as compared with only 1 in 20 specialists. (The high proportion of family doctors in single salaried positions probably reflects the fact that family medicine emerged in the 1970s as a residency program aimed at satisfying the requirements of public sector organizations.) Type of specialty partly mediated the effects of other variables. In addition to the impact

TABLE 3—Medical Employment Patterns Stratified by Demographic, Social, and Educational Factors: Mexico, 1993

Medical Employment Pattern	Independent Variables, %														
	Generation			Gender		Social Origin			Medical School Quality			Type of Specialty			
	Up to 1970	1971– 1980	1980– 1988	Male	Female	Low	Middle	High	Inadequate	Average	Good	Without Specialty	Family Medicine	Basic Specialties	Sub- specialties
Salaried single employment	29	40	51	35	47	39	41	33	44	38	32	39	70	35	30
Independent single employment	17	12	8	15	7	15	11	13	11	14	14	14	3	11	16
Multiple employment	43	33	17	39	18	31	34	39	26	37	38	17	21	49	48
Quantitative underemployment	5	5	8	4	12	6	5	6	6	4	7	9	5	3	4
Qualitative underemployment	4	8	6	6	9	6	7	6	8	6	6	14	1	2	2
Unemployment	2	2	9	2	8	4	2	5	5	2	3	7	0	1	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
No.	336	557	180	771	302	491	364	215	374	431	259	449	77	258	289
χ^2		80		102			12			28				210	
P		.0001		.0001		.273			.002					.0001	
Cramer's V		0.19		0.31		0.08			0.12					0.26	

Note. Column totals differ by up to 1% owing to rounding error.

attributable to gender, the quality of the medical school attended affected the probability of securing residency training. Graduates from good schools were 1.7 times more likely to have finished a residency than those from schools of lower quality.

Discussion

The results point to an improvement in the employment situation of physicians between 1986 and 1993. This is reflected in reduced rates of unemployment and underemployment, which in turn suggest that the containment policies of the mid-1980s were successful. Of course, the observed improvement cannot be attributed solely to the policy interventions; the media visibility of unemployment is also likely to have discouraged potential applicants to medical school. (Although there are no data on the total pool of applicants, registries at the National University, the largest in the country, show a 64% decline between 1975 and 1987.) It would seem, therefore, that the observed reduction in the supply of physicians is the result of a response both to labor market "signals" and to explicit policies that involved all of the major actors in a concerted effort.

While the figure of 18900 unemployed or underemployed doctors in the 34 study cities is certainly a reduction from the 23500 found 7 years earlier in 16 cities, it still represents wasted human resources. Furthermore, the Mexican case shows that expanding the supply of doctors has long-term effects and does not improve per se their geographic distribution. Hence, suggestions to increase supply again must be tempered by the persistence of imbalances.

These imbalances are more than simply quantitative. The most important qualitative imbalance is the segregation of physicians into different segments of the labor market. There is a mainstream segment formed by physicians (mostly specialists) with stable employment and reasonable productivity. This group coexists with doctors (mostly general practitioners, with an overrepresentation of women) who cannot find a job, have abandoned the profession, or continue to work in it with low income and productivity.

This unequal distribution of occupational opportunities is related to ascription factors such as social origin and gender acting through attainment variables such as medical school quality and, most important, postgraduate training. Thus, the 1993 study reinforces the notion—documented in the first survey⁴—of a paradoxical effect whereby the structure

of higher education and health care may end up reproducing social inequalities rather than ameliorating them.

An interesting finding is that the effect of social origin weakened considerably during the period. In particular, social differentials in access to good schools (although not to schools of lower quality) are now negligible. This could be due to 2 circumstances. The first is that schools that previously were of inadequate quality and catered to students of low social origin managed to improve their quality while continuing to serve the same group. The second possibility is that good schools have made admissions increasingly dependent on academic potential rather than on economic means. Both of these possibilities represent positive developments.

In contrast, the effect of gender has become more important over time. The increased participation of women in medicine seems to be accompanied by gender polarization. Women are concentrated in the categories of underemployment and the lowest-paying types of full employment. Female physicians may sacrifice remuneration for lower hours of work to deal with family responsibilities in the face of limited child care options and inflexible work conditions.¹¹ These are key issues for future studies.

Gender differentials acquire additional importance given that the majority of current medical students are women. The lower number of hours worked by women and their higher probability of absences suggest that the total supply of physician time may decline. This may also translate into difficulties in skill maintenance in the face of advances in technology and knowledge. To prevent these potential negative effects, the growing presence of women in the medical profession must be accompanied by explicit efforts to support them in other social roles. Equality in educational opportunities must be accompanied by equality in occupational opportunities.

As a result of quantitative and qualitative imbalances, the organization of medical work is changing. Medicine is a profession in transition. The main lesson from the Mexican experience is that an overabundance of physicians has dysfunctional consequences not only for doctors themselves but also for the system as a whole, including the population. The search for balanced health systems represents a major challenge of our times. □

Contributors

J. Frenk designed the study, negotiated the logistics for data collection, participated in the data analysis, interpreted the results, and wrote most of the manu-

script. F. M. Knaul performed the data analysis, interpreted the results, reviewed the literature, wrote several sections of the manuscript, and edited the revised version. L. A. Vázquez-Segovia participated in the design of the study, coordinated and supervised the fieldwork, managed the database, obtained and analyzed the historical time series, and revised the manuscript. G. Nigenda participated in the design of the study, the fieldwork, and the data analysis; wrote a section of the manuscript; and revised the different versions.

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