

Opportunities for Cost Reduction in Diabetic Retinopathy Treatment: Case Study from Mexico¹

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A study was performed in order to explore the costs of treating diabetic retinopathy at a large eye hospital in Mexico with a view to identifying opportunities for improving efficiency. Clinical records of a random sample of 69 diabetic patients were reviewed for data on each patient's background, medical history, and treatment; and the costs of all resources utilized in each type of procedure provided were documented and priced. The resulting data on clinical costs was complemented by data on the private costs of treatment (medical fees, accommodation costs, transportation costs, and lost wages) that were gathered from patient interviews. The study found that the patients, who were generally poor, shouldered a substantial economic burden associated with treatment at the hospital; however, less than half this burden was in the form of fees. The rest involved other out-of-pocket expenditures on food, travel, and accommodation (45% of the total) and lost wages (10% of the total). Suggestions for reducing various of these costs without endangering treatment quality are presented. These include suggestions for reducing waiting time; reducing the number of patient visits required by increasing the strength of individual laser treatments, completing more procedures in a single visit, and reviewing hospital policy on fluoroangiograms; and increasing the chances for early and effective treatment by educating at-risk relatives accompanying the patients about the need for early treatment.

The prevalence of diabetic eye problems in Mexico is not known with any certainty but is likely to be high. Diabetes is a common health problem; 1.2% of the Mexican population is reported to have the disease (1), and the true prev-

alence is probably at least double that figure (2).

Diabetics run a relatively high risk of developing serious eye problems, particularly retinopathy. In the United States, for example, legal blindness is 25 times more common in diabetic patients than in the rest of the population (3). Indeed, development of eye problems is thought to be an almost inevitable consequence of diabetes, the duration of diabetes being one of the strongest predictors for retinopathy (4), though improved glucose control may delay the development of problems, while under some circumstances surgical and laser techniques can effectively arrest deterioration and even improve sight.

Failing sight reduces productivity and leads individuals to seek treatment. The

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resulting costs are probably high in developing countries, though these have been little studied. There have been a few studies on the cost-effectiveness of eye treatment for diabetics in developed countries, such as Javitt et al. (5), but even these have not provided a detailed analysis of the costs involved.

The present study was designed to explore the nature of treatment costs in a large eye hospital in Mexico City—the Hospital for the Prevention of Blindness. This is a private, nonprofit 60-bed hospital treating approximately 5 000 in-patients and 30 000 new outpatients every year. It is relatively well-endowed with equipment and trained staff, and it attracts patients who would otherwise utilize social security facilities or private practitioners. It also serves substantial numbers of patients from the poor, uninsured sector of the population that would generally be served otherwise by Ministry of Health facilities. Four percent of the hospital's outpatients are diabetic patients, 75% of whom have diabetic retinopathy (6); these latter are referred to the hospital's retina clinic, which sees over 1 500 new patients a year.

The study reported here uses data from this retina clinic to address the following questions: What are the costs of treating the eye problems of diabetics attending the retina clinic; who bears these costs; and what strategies could be used to reduce them?

METHODS

The study had three phases. The first consisted of a review of clinical records to determine the nature of treatment provided to patients over a 5-year period. For this purpose 115 clinical records were selected in a systematic random fashion from the register of those 619 patients who attended the retina clinic for the first time in the second half of 1985, the ear-

liest year when reliable records on first-time attendees at the clinic were readily available.

For those 69 patients (60%) diagnosed as diabetic, data were gathered on demographic and socioeconomic variables, diabetic treatment, initial eye diagnosis, and the amount and type of eye treatment provided by the hospital from 1985 to the beginning of 1991 (see Table 1). In addition, relationships between some of these variables were explored (see Table 2). Because 94% of these patients had not been to the hospital in the last 12 months, and 85% had not been for the last 3 years, it seems likely that the collected data captured most of the history of each patient's utilization of this hospital's services.

In its second phase, the study sought to determine the cost of the resources used for each type of treatment provided to these patients. In the case of key outpatient services,⁵ the number of staff and quantities of space, materials, and equipment used by those services were measured and information on salary levels and prices obtained so that direct costs could be calculated. To these direct costs were added a share of outpatient overhead costs, a share determined by the relationship of the value of medical salaries in each particular service to total outpatient medical salaries. For services requiring hospitalization, the average cost per hospitalized day was calculated⁶ and applied to the estimated length of stay for each type of operation—a reasonable

⁵Excluding lab tests, cryotherapy, internal medicine checkup, and eyeglasses check, for which only data on fees are available.

⁶The accounts section of the hospital calculated that in 1990 Mex\$ 2 752 000 000 was expended on the in-patient facility. To this were added 66% of the hospital's administrative costs (Mex\$ 1 320 000 000), a percentage based on the hospital's share of total nonadministrative costs, and the total was increased by 20% (for inflation) to give total in-patient costs in 1991 (1991 Mex\$ 3 000 = US\$ 1).

Table 1. Basic sociodemographic and medical data on diabetic patients attending the retina clinic for the first time in 1985 (n = 69) and those interviewed in 1991 (n = 51).

	1985 patients				1991 patients
<i>Sociodemographic characteristics:</i>					
Average age	59 years				59 years
≤65 years	77%				76%
Male	42%				45%
Living in Mexico City	68%				43%
Completed primary school	35%				45%
Average years of school	3.5 years				5 years
Right of access to Social Security	n/a				49%
Has private health insurance	n/a				0%
Fees reimbursed from any source	n/a				0%
<i>Diabetes history and treatment:</i>					
Average length of time with diabetes	14 years				18 years
Onset after age 30	95%				98%
Taking insulin	12%				18%
Taking hypoglycemic drugs	76%				73%
<i>Condition of eyes at first visit:</i>					
% of patients with: ^a	right	left	best	worst	
good sight	4%	4%	6%	3%	n/a
poor sight	37%	33%	46%	24%	n/a
very poor sight	31%	47%	42%	35%	n/a
no sight	28%	16%	6%	38%	n/a
<i>% of patients with retinopathy:</i>					
Proliferative in at least one eye	60%				n/a
Preproliferative or proliferative in at least one eye	77%				n/a
Preproliferative or proliferative in both eyes	50%				n/a
<i>Treatment at hospital over 5 years;</i>					
average-number of visits to the hospital per patient:	9 visits				n/a
<i>% of patients making:</i>					
1 visit	12%				n/a
2–9 visits	57%				n/a
10–19 visits	19%				n/a
≥20 visits	9%				n/a
<i>% of patients receiving laser treatments:</i>					
	51%				n/a
<i>For those patients receiving laser treatments:</i>					
Average no. of laser treatments	3.7				n/a
% receiving 5 or more sessions	31%				n/a
% who had a fluoroangiogram	60%				n/a
% with fluoroangiogram receiving laser treatments	84%				n/a
<i>Average number of laser shots per session:</i>					
Argon	652 shots				n/a
Xenon	639 shots				n/a
Krypton	114 shots				n/a

^a“Good sight” is compatible with normal functioning, including reading (8/10–10/10). “Poor sight” involves loss of capacity for reading and close work, but the subject is still able to move about unaided (1/10–7/10). “Very poor sight” implies a need for assistance with most tasks, but the subject is still able to count his or her fingers at close quarters (<1/10). “No sight” means the subject is at best able to see close hand movements or distinguish between light and dark (<1/10).

Table 2. Relationships between age, gender, education, insulin use, number of patient visits, and eyesight among members of the 1985 study sample (n = 69).

	Gender		Insulin use		Education	
	Female	Male	Yes	No	≥Primary	<Primary
Average age (years)	59	58	50 ^b	60 ^b	54 ^b	61 ^b
Average length of education (years)	2.8 ^c	4.4 ^c	5.9 ^c	3.3 ^c	7.6 ^b	1.3 ^b
Number of visits	9.1	8.9	14.8 ^b	8.5 ^b	12 ^b	7.4 ^b
Eye score ^a	6.1 ^b	5 ^b	6.1	5.5	5.4	5.7

^aEyesight: The visual acuity of each eye was scored and the two scores were added together. The scores assigned were as follows: 7/10–10/10 = 1; 1/10–6/10 = 2; can at best perceive hand movements = 3; can at best perceive light = 4.

^bP < 0.05.

^cP < 0.10.

approach considering that the hospital was functioning at nearly full capacity. Data on the average number of different types of treatment visits by the 69 diabetic study subjects were combined with information on the full hospital cost per visit to derive estimates of the average cost to the hospital per patient over the 5-year period (see Table 3).

The third phase of the study used patient interviews to obtain information about the associated costs of treatment (fees, accommodation costs, transportation costs, and lost wages) that were incurred by the patients and those accompanying them, and also information about the impact of the eye problem itself (see Table 4). Since it was not feasible to track down those same 1985 patients whose clinical records were reviewed for data on hospital attendance and treatment, a different sample of 51 randomly selected diabetic patients attending the retina clinic in the last 2 weeks of February 1991 was interviewed. As indicated in Table 1, the two groups of patients possessed similar key characteristics.

Table 5 combines the data on medical costs and associated direct and indirect costs to estimate the average cost per patient over a 5-year period. The costs involved were not discounted over time, a

reasonable simplification considering that the average span of time over which patients attended the hospital was 11 months. All of the costs cited in the text and in Tables 3, 4, and 5 are expressed in 1991 Mexican pesos (1991 Mex\$ 3 000 = US\$ 1).

RESULTS

Although over three-quarters of the diabetic study subjects attending the retina clinic for the first time were under 65 years of age, in their nominally productive years, most of the subjects were relatively old. Most also had little formal education, the average being 5 years of primary school for the better-educated 1991 sample, and low income (see Tables 1 and 4). Those 1991 subjects and their companions who were working earned an average of Mex\$ 600 000 and Mex\$ 780 000 per month, respectively, equivalent in 1991 to a little over US\$ 200 per month (see Table 4). Many of the patients considered themselves too old (18%) or too ill (43%) to work. Half of the 1991 patients had no right to social security, which is available to workers in the formal economic production sector and their dependents. None of the interviewed patients had private health insurance, and

Table 3. Full hospital costs and fees charged, in 1991 Mexican pesos,^a for the average number of treatments received over 5 years by patients who first attended the retina clinic in 1985 (n = 69).

Type of treatment	Average No. of treatments per patient	Fees charged per treatment (pesos) ^a	Fees/patient for average no. of treatments (pesos)	% of total fee payments for this treatment	Full hospital costs per treatment (pesos)	Full cost per patient for average no. of treatments (pesos)	% of total costs paid by patients
Checkup	4.91	15 000	73 650	10%	19 000	93 290	79%
Angiogram	0.51	110 000	56 100	8%	65 000	33 150	169%
Echography	0.4	60 000	24 000	3%	48 000	19 200	125%
Internal medicine	0.4	15 000	6 000	1%	15 000	6 000	100%
Labs	0.4	150 000	60 000	9%	150 000	60 000	100%
Laser	1.86	110 000	204 600	29%	29 000	53 940	379%
Cryotherapy	0.12	350 000	42 000	6%	350 000	42 000	100%
Vitrectomy	0.1	1 100 000	110 000	16%	1 916 000	191 600	57%
Cataract	0.13	750 000	97 500	14%	2 690 000	349 700	28%
Eyeglasses	0.14	200 000	28 000	4%	200 000	28 000	100%
Total	8.97		701 850	100%		876 880	

^a1991 Mex\$ 3 000 = US\$ 1.

Table 4. Non-fee costs of a hospital visit, in 1991 Mexican pesos,^a incurred by patients interviewed in 1991 (n = 51) and long-term problems caused by poor eyesight.

<i>Direct non-fee cost (per visit for patient and those accompanying the patient):</i>		
Transportation costs	Mex\$ 61 500	(80%)
Accommodation	Mex\$ 3 500	(4%)
Other costs	Mex\$ 12 500	(16%)
Total direct cost per visit	Mex\$ 77 500	(100%)
<i>Indirect costs:</i>		
<i>Time loss:</i>		
Average length of trip (for those without overnight stay)	9 hours	
Average length of trip (for those with overnight stay)	3 days	
Percentage requiring at least one overnight stay	30%	
Average number of effective days lost	2 days	
<i>Productivity loss:</i>		
% patients employed (and average monthly earnings)	15% (Mex\$ 600 000)	
% patients accompanied by someone	84%	
% of these companions employed (and average monthly earnings)	51% (Mex\$ 780 000)	
Average value of productive time lost per visit	Mex\$ 34 000	
<i>Income loss:</i>		
% of productive value loss borne by family as lost income	50%	
Average value of lost income per visit	Mex\$ 17 000	
<i>Disability:</i>		
Percentage of unemployed claiming that poor sight was responsible for being unemployed	51%	
Percentage of patients claiming that poor sight had led to:		
severe depression	16%	
job loss or change of job	48%	
need for much greater help in daily life	50%	
pain	50%	

^a1991 Mex\$ 3 000 = US\$ 1.

none were reimbursed from any source for their costs.

As indicated in Table 5, the total social cost of treatment per subject over 5 years averaged Mex\$ 1 877 000 (US\$ 630). The hospital was found to subsidize some of these costs, particularly in-patient operations; and employers were found to relieve the wage losses of some subjects;

but in the end, the study subjects and their families were found to shoulder most (83%) of these costs. Many of the subjects (40%) were found to incur costs exceeding Mex\$ 1 million, while 6% had costs exceeding Mex\$ 5 million—substantial sums for these patients representing 1.5 and 8 months, respectively, of the average working patient's wages.

Table 5. Full average costs of treatment per patient (social costs and those incurred by the patient).

	Pesos ^a	% of total
<i>Average costs per patient to the patient:</i>		
Fees	701 850	45
Other direct expenses	695 175	45
Indirect (income) losses	152 490	10
Total	1 549 515 ^b	100
<i>Average full social cost of hospital treatment per patient:</i>		
Hospital costs	876 880	47
Travel and other expenses	695 175	37
Productivity losses	304 980	16
Total	1 877 035 ^b	100

^a1991 Mex\$ 3 000 = US\$ 1.

^bPercentage of full social costs paid by the patient = $1\,549\,515 / 1\,877\,035 \times 100 = 83\%$

These costs are probably lower than costs of comparable treatment elsewhere in Mexico, partly because of the number of patients over which important fixed costs such as equipment (which accounts for a significant share of the total cost of most of the services) can be averaged. The costs are also lower because the salaries paid to the hospital's medical staff, while similar to those paid medical staff members by the Ministry of Health, are less than half of those paid by the social security system and less than a tenth of those that can be earned in the private sector. (Physicians nevertheless continue working at the hospital because of the excellent opportunity for gaining experience that it affords.)

These cost differences are reflected to some extent in the fees charged. For example, a privately performed vitrectomy would cost about five times the fee charged at this hospital. The relatively low cost (and reliable service) may explain why a large and apparently increasing proportion of patients come from outside Mexico City (32% of our study subjects in 1985, 57% in 1991), and why about half (49%) of the 1991 study subjects elected to pay for the hospital's services despite membership in one of the

social security schemes entitling them to free medical services elsewhere (see Table 1).

Although fees accounted for a substantial proportion of the costs to patients, over 50% of patient costs were in fact the result of other expenses and lost income (see Table 5). On the average, the interview data show that the patient and his or her family incurred non-fee costs of nearly Mex\$ 100 000 per visit. Furthermore, this is likely to have been an underestimate for two reasons: Only patients attending outpatient services were interviewed, thereby excluding the more costly visits involving hospitalization; and time losses were assigned a cost only if the people involved were currently income earners.

The average 1985 patient in the study sample made about 9 visits to the hospital (see Table 1), and one patient made 36 visits. Subjects in the 1985 sample with at least primary school education made over 50% more visits to the hospital, on the average, than the rest of the subjects (see Table 2)—perhaps because they could afford to.

Insulin users were another group making more frequent visits for treatment (see Table 2), perhaps because their eye prob-

lems required more extensive treatment, and also perhaps because they had better capacity to pay—as suggested by their significantly greater education (see Table 2).

This latter relationship between educational status and insulin use might be explained in any of various ways. The better-educated could have been more likely to develop diabetes requiring insulin because of their life-style; or they could have been more likely to be put on insulin because of their capacity to pay; or educational status may simply have been acting as a proxy for age, younger Mexicans having had more education and insulin users in the study sample being 10 years younger, on the average, than other subjects (see Table 2).

Most of the 1985 study subjects were in an advanced stage of visual deterioration when they made their first visit to the retina clinic (see Table 1). Indeed, 48% were legally blind, with a visual acuity of less than 1/10 in both eyes. Not surprisingly, many patients attending the clinic were depressed, needed a lot of help in their daily lives, or experienced some pain associated with the eye problem (see Table 4). The impact of poor eyesight on these subjects' productivity seems likely to have been substantial: many were nominally in their productive years (77% being 65 or younger), and over half (51%) of the 85% not working gave poor sight as the reason for being unemployed (see Tables 1 and 4).

Most study subjects had not received treatment elsewhere when they came to the hospital for the first time; such tardy approaches for treatment are also common in other institutions (H. Quiroz, personal observation). Of those who had already sought treatment elsewhere, many came to this hospital because they could no longer afford private care, or because they had lost their jobs and their right to social security care, or because the Min-

istry of Health was not providing adequate service (H. Quiroz, personal observations).

Nearly a third (31%) of the 1985 subjects receiving laser treatments visited the hospital at least five times for these treatments (see Table 1). This high frequency of visits is probably related to the low strength of the laser treatments given. Patients receiving argon laser treatments received an average of only 652 "shots" per visit (see Table 1), and less than half of the treated patients received more than 1 000 shots in all, the minimum treatment recommended in the literature. These data reflect the treatment policy prevailing some 4 to 5 years ago, but since then the situation appears to have undergone little change (6).

DISCUSSION

Although few of the 1991 patients interviewed had any complaints about treatment, there are clearly some modifications that might benefit patients without necessarily penalizing the hospital. In particular, certain changes could substantially reduce the costs borne by the patients, most of whom are relatively poor.

As long as the hospital is required to recover its running costs through charges to patients, it is not obvious how significant downward revisions in the fee schedule could be countenanced. The hospital is in effect cross-subsidizing inpatient costs from outpatient charges; outpatients pay more than the hospital running costs associated with some treatments, while the charges for in-patient treatment are less than the full costs (see Table 3).

It is possible that a close study of hospital procedures might identify opportunities to improve efficiency, which could permit fee levels to be lowered. In the meantime, however, there are other ways to ameliorate the economic burden on pa-

tients. Fees represent only part of patients' costs, and fee schedules are only one of the policy instruments at the disposal of the hospital.

Reducing Visits

Each patient visit to the hospital is costly in terms of time, energy, and anxiety. It also has financial ramifications that go well beyond the fees paid to the hospital. Therefore, reducing the number of visits could substantially lower the economic impact of treatment, even if fee levels remained the same.

One way of reducing the number of visits would be to increase the strength of laser treatment—which would also help to ensure that each patient received an adequate overall quantity of laser shots. Even if patients were charged double the fee for a session twice the normal length (this should not be necessary, since some of the costs are fixed), the time and other costs associated with making another visit would be saved.

A second possibility is to allow patients to complete more procedures in a single visit—for example, by offering those for whom a fluoroangiogram or echography is recommended the option of having those procedures completed on the same day as the checkup.

A third possibility is to reduce the number of checkups. Approximately 57% of all visits made by the 1991 study subjects were for checkups that did not involve any treatments. One patient came on 23 separate occasions for checkups. The fee costs of such frequent checkups are relatively small; but the cost of lost wages, transportation, and sometimes accommodation can be heavy. It may be that in some or even many cases, checkups could be scheduled in a more selective manner, made less frequent, or done elsewhere.

Finally, the policy on fluoroangio-

grams might be reconsidered. Fluoroangiograms are designed to provide information ensuring that laser treatment is directed at the appropriate part of the retina. While most of the 1985 study subjects given a fluoroangiogram also received laser treatment, 16% did not, and so the cost of this test was essentially wasted. If this was the result of a patient choosing not to go in for laser treatment, arranging for further advice to patients might be an appropriate strategy. If it was the result of a subsequent decision by the hospital staff that laser treatment was not necessary or not possible, hospital policy could be revised.

Reducing Waiting Time

Physicians' time is valuable, and leaving equipment idle is clearly undesirable. Health services are usually organized to minimize these losses, but often at the expense of patients who must wait long periods for their turn. Such waiting involves significant costs for many patients, not only in terms of wasted opportunities for other activities, but also in terms of associated discomfort and anxiety. One possibility for reducing this waiting time is to establish an appointment system taking into account past experience with the percentage of patients who come for their appointments and the average length of time spent per appointment.

Reducing Long-term Demand for Treatment

The eye hospital could also consider playing a more active role in reducing long-term demand for treatment. Most patients are accompanied to the hospital by a relative, usually a son or daughter, who will have an elevated risk of developing diabetes. These relatives have also witnessed the unpleasant consequences

of diabetes at close range and are likely to be a receptive audience for educational messages concerning diabetes and its complications. Patients and those who accompany them normally wait some hours before they are seen by the doctor. Using this or some other appropriate time period for carefully designed educational sessions directed at nonpatients could prove a worthwhile investment of time and money.

Timely Visits

Our study indicates that in many cases patients were coming to the hospital too late for treatment to be really effective. Rectifying this situation would require changes largely outside the control of the hospital itself. Patients need to be referred in a timely fashion for eye checks. Since severe retinopathy is often detected shortly after noninsulin-dependent diabetes is diagnosed, one strategy would be to refer newly diagnosed diabetic patients for an eye checkup. Studies elsewhere have shown that regular screening for retinopathy, at least in insulin-dependent diabetes patients, can result in net savings to society (8). Within this context, efforts to promote more timely initial visits could focus on women, people residing outside Mexico City, and the less educated, since these were the groups our study found to have poorer eyesight at the time of their initial hospital visit.

Of course, instituting more timely eye checks and treatment demands a carefully planned strategy of manpower training and technical support. Design of appropriate policies should build on an analysis of the costs and benefits of various options for screening (with respect to frequency, targeting, and detection methods) and for treatment (with respect to targeting, intensiveness, and location) in the manner of cost-benefit analyses recently undertaken

for the United States of America (8, 9) and the United Kingdom (10).

CONCLUSIONS

The results of this study highlight the considerable treatment costs borne by many diabetic patients with serious eye problems in Mexico and the opportunities for reducing such costs. They also point to a need for further research, especially to clarify the extent of benefits gained by the patients from treatment received, most notably from photocoagulation laser therapy.

There is some evidence in the literature concerning the effectiveness of this technique—see Nathan (11) for a recent review—but it is not clear how well it applies to a population such as the one covered in this study whose members are relatively old, often in an advanced stage of visual deterioration, and with a high probability of dropping out of treatment. To assess the effect of laser treatment it would be important to distinguish the effects of treatment *per se* from other effects of visiting the hospital, particularly the improvement in glucose control which may follow from regular medical attention, increased knowledge, and the motivation to avoid further eye problems.

A second area worth exploring is the reason for the high proportion of patients (12%) who came only once to the hospital and had a checkup but no treatment. Did this occur because these patients in fact needed further treatment (in which case the referral system in the hospital may need to change), or did it happen because the patients chose not to return even though further attention was recommended (if so the reasons behind this choice should be determined)?

Although this study draws on data from a single hospital in Mexico City, there are reasons for believing that the population surveyed may represent a significant pro-

portion of Mexican diabetics with serious eye problems. In the United States, the incidence of blindness is 1.05 per 1 000 diabetics per year (12). If one applied this incidence to Mexico, with its population of some 80 million, 1.2% of whom report being diabetic (1), it would suggest that about 1 000 Mexicans become blind annually as a result of diabetes.

It is true that Mexico has a younger population and a lower proportion of diabetics who are insulin-dependent, suggesting that diabetic eye problems would be less frequent in Mexico than in the United States of America. On the other hand, there is evidence of a relatively great genetic propensity to retinopathy among Mexicans in the United States of America (13), which could be exacerbated by the poorer glucose control and less ready access to treatment that probably characterize the population of diabetics in Mexico.

According to the sample of 1985 records studied, an estimated 390 of the 1 300 new patients attending the retina clinic that year were legally blind diabetics, which would account for nearly 40% of all diabetics estimated to become blind each year in Mexico. If, as suspected, most diabetic patients do not seek treatment for eye problems until their condition is well advanced, the conclusions derived from this small study could be of broad relevance to diabetics in Mexico.

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Prospective Studies on the Health Effects of Tobacco in the Americas

The recent PAHO report *Tobacco or Health: Status in the Americas* contains estimates of tobacco-attributable mortality for several countries, but these estimates can only be considered approximate in view of the lack of detailed data. Recognizing the urgent need for local studies in developing countries in order to document and monitor the tobacco epidemic, the World Health Organization, in collaboration with the University of Oxford (United Kingdom), is promoting the conduct of prospective cohort studies, which would follow the survival of smokers compared with nonsmokers and yield relative risk estimates that take into account the local epidemiologic environment.

A number of countries in the Americas have either begun to carry out prospective studies on tobacco-attributable mortality or are planning to do so. The longest and largest such study is that of the American Cancer Society in the United States of America, which has been following the mortality of over 1 million persons aged 30 years and over since 1982. Another study has commenced in Mexico City and has enrolled approximately 200 000 adults. In Cuba, a pilot study was carried out in 1992; the results are being analyzed before a larger prospective study on approximately 300 000 adults is begun. Prospective studies in Brazil (São Paulo) and Argentina (Buenos Aires) are under consideration, and funds to implement them are being sought.

A first-time meeting of the global network of prospective studies on the health effects of tobacco is expected to take place in connection with the Ninth World Conference on Tobacco and Health, to be held in Paris in October 1994. That workshop will allow researchers to exchange views, present results, and develop a common approach to research and analysis.

Source: Prospective studies on the health effects of tobacco in the Americas. *Tobacco Alert* [newsletter of the World Health Organization's Tobacco or Health Program], October 1993, p.3.