EVOLUTION OF EQUITY IN THE HEALTH CARE SYSTEM IN COLOMBIA: THE ROLE OF OUT-OF-POCKET PAYMENTS

Final Report

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BACKGROUND

Colombia is a middle income country with 42 million people, a per-capita income of $6,810 ppp in 1997, and life expectancy at birth of 70.7 years. Within the wave of health care reforms that took place in many countries during the past decade, Colombia launched in 1993 one of the most innovative initiatives in this field, creating a system based on social insurance, as opposed to the previous segmented model (Londoño and Frenk, 1997). In the previous model, as in many other Latin American countries, the working population (about 20% of the total population) was covered by a mandatory social health insurance system; in this system, insurers had captive enrollees and their monopoly power gave rise to decreased quality and efficiency; the better-off minority purchased private insurance, whose coverage (about 5% of the population) overlapped to some extent with the coverage of social insurance for the working population; the remainder of the population was covered by the publicly financed system that received supply-side subsidies; facilities in the public system provided open access to health care services for the poor and charged user fees, but actual coverage fell short of the excess demand they faced, and users of these facilities still faced high out-of-pocket (OOP) expenses.

The new system aimed at universal coverage, equity, efficiency and improved quality of services. The reform introduces new competitors to the health insurance market exposing the former insurers of the working population to competition; some of the new entrants are private for-profit, others private not-for-profit or public; this part of the system is called the contributive regimen, and its enrollees are the working population and their family groups; it also covers independent workers whose income is above two minimum salaries, pensioners, and their family groups.

The contributive regimen is almost totally financed by earmarked payroll taxes, and additional revenues are derived from co-insurance; salaried workers, pensioners or independent workers pay 12% of their income, and the revenues collected go to a compensation fund that returns to each insurer a risk-adjusted capitated premium for each enrollee and his/her family members, whose amount is independent of the payment done by the enrollee.

There is a separate regimen for the poor or for those who cannot afford to pay for enrollment in the contributive regimen, that is called the subsidized regimen; in this system, local governmental authorities apply a proxy-means test in order to determine who is elligible for the subsidized health insurance; funding for the subsidized regimen comes from a twelfth of the payroll tax for the contributive regimen, and from public resources coming from the national budget. Most of these public resources come from new allocations created by the constitutional reform of 1991, and from the transformation of the allocations that are traditionally sent to local governments as supply-side subsidies for public health care facilities;

this tranformation aims to abolish the supply-side subsidies and convert all those resources into demand-side subsidies.

Individuals in both regimens are free to choose their insurer within the corresponding regimen and to shift from one insurer to another as they see fit; free choice of insurer is expected to stimulate competition and responsiveness to consumer's expectations among insurers, but at the same time entails the undesired consequences of imperfect competition in health insurance, namely, adverse selection and cream skimming.

Insurance coverage has not reached the whole population; by 2000, about 43% of the population still lacks coverage by an insurer (Superintendencia de Salud, 2000), which means they are still locked in the publicly financed network, receiving services via supply-side subsidies, or going by themselves to private providers if they can afford to; consequently, the transformation of supply-side subsidies into demand-side subsidies has not taken place as scheduled in 1993. Nonetheless, the big jump ahead in insurance coverage (from 20% to roughly 50% of the population), has contributed to progressive income redistribution, as shown by Ramírez et al. (2000) and Sanchez and Nuñez (1999).

One of the boons of an insurance-based health care systems is the spreading of risks among large population groups, which leads to the reduction of OOP payments households face when on of its members falls sick. The negative impact of OOP payments on usage of health care services has been demonstrated in the well-known RAND experiment, which concluded that co-insurance decreases overall utilization, but the impact is significant on the utilization of outpatient services but not of inpatient services (Manning et al, 1987); however, given information asymmetry, reductions in utilization can affect innecessary but also medically necessary services.

The larger the share of the population coverd by prepaid pools, the comprehensiveness of the benefit package, and the proportion of poor covered by such system, the lower the restrictions to access that are caused by inability to pay; this is consistent with the principle of fairness of financial risk protection, which "requires the highest possible degree of separation between contributions and utilization" (WHO 2000); put another way, the requirements of an equitable health care system demand a financing scheme in which contributions vary according to ability to pay, and a delivery scheme in which access to services varies with need and irrespective of ability to pay.

The more demanding characteristics of these requirements, as compared to those of other goods in the economy, stem from the generally accepted principle that health care is a special good; from a utilitarian perspective, it could be argued that the high contribution of health care to aggregate welfare is a reason to provide universal coverage; egalitarians' views regarding the obligation to compensate the results of the natural and social lottery, and the ensuing equality-of-opportunity principle, justify the active intervention of the society to provide health care services to all (Daniels, 1998); in a more recent approach, Sen's persepective calls

for the provision of health care and education, among others, as instrumental freedoms that are necessary for the enhancement of the individual's substantive freedom to live better (Sen, 1999). Although from a libertarian perspective there is no justification for the provision of health care for those who cannot afford it by themselves, even in highly individualistic societies like the United States, there is a safety net that reduces financial barriers to the lowest income groups.

If it is accepted that health care is special, a strong test on how equitable (with regards to financing) a health care system is, rests on how the financial burden of OOP expenses is distributed among households (Daniels et al, 2000). However, given that health care systems use other sources of financing (i.e., general taxation, payroll taxes for social insurance, private insurance, and, in poorer countries, donor contributions) in different combinations, the overall fairness of financial contribution will depend on how regressive or progressive each of the sources is, and on the weight corresponding to each of the four alternative sources of financing (Wagstaff and van Doorslaer, 2000)

Evidence from other countries show that OOP expenses are a very regressive source of financing. Rassel et al (1994) showed that in the US, low-income families spent, on average, 8.5% of their income in health expenditures, while high-income families spent only 1 percent. Wagstaff et al (1999) show in a comprehensive analysis of 13 OECD countries that direct payments behave regressively in all of them. Evidence from developing countries is not as readily available as that from industrialized economies; however, Pannarunothai (1997) shows that in Thailand, in spite of poor quality of data, underprivileged families spent about 5 to 6% of their incomes as OOP payments, whereas other groups spent 1 to 2%.

In the colombian health care system, the share of financing that is raised through OOP payments is still large, though estimations are divergent; evidence from 1993 suggests that at least 40% of the health system revenues were provided by households as OOP payments (Harvard, 1996), while other evidence suggests that in 1995 and 1996 it was 59% (Vargas, 1997). A more recent study undertaken by the National Department of Planning within the National Health Accounts project, shows unofficial preliminary evidence that the share paid by households as direct payments to providers has decreased from around 40% in 1993 to around 25% in 1997 (Departamento Nacional de Planeacion, 2000); although this evidence is still subject to review, it is consistent with Harvard's estimations for 1993, and is also consistent with the fact that public funds allocated to health care have had substantial growth during the first five years following the health care reform.

If we assume that at least one fourth to one third of the Colombian health care system is financed through households' cash payments, we would expect a heavy impact of the regressivity of this source on the overall fairness of financial contribution. Nonetheless, according to WHO (2000), in 1997 Colombia was the fairest system in terms of financial contribution, outperforming many countries that

are well known for their progressive health care financing, such as the United Kingdom, Spain, France and Finland (Wagstaff et al., 1999)

To the extent that the new health care system increases insurance coverage, households will have to pay lower amounts of money out of their pockets. Although the overall regressivity or progressivity of the financing scheme will also depend on the ultimate incidence of such a scheme on household incomes, it is interesting to assess how the regressive burden of OOP payments has evolved as a result of the 1993 reform. If the increase in insurance coverage has benefitted the poor, it could be argued that their share of their income that goes to direct payments to providers decreases.

METHODOLOGY

Data sources

We used five nation-wide cross-sectional surveys for the analysis, with the purpose of covering a period from nine years before to seven years after the reform; such wide time frame would allow us to undertake relevant comparisons that we expected would show clear changes before and after 1993. The surveys we used are:

- Income and expenses survey (1984-1985); hereinafter Inexp8485
- Income and expenses survey (1994-1995); hereinafter Inexp9495
- Socioeconomic characterization survey (1993); hereinafter CASEN93
- Quality of life survey (1997); hereinafter QOL97
- National household survey, step 107 (2000): hereinafter NHS00

The original purpose of Inexp8485 and Inexp9495 surveys was to determine the basket of goods to set the baseline for the estimation of the Consumer Price Index; these surveys collected comprehensive information about the items purchased by urban households during a one-week period, and the sample households were distributed through a 52-week period in order to control for stationarity in consumption. The CASEN93 survey was aimed at getting a detailed characterization of households' socioeconomic variables; this characterization was the basic input for the design of a proxy-means test for targeting subsidies for the poor.[1] The QOL97 survey was a local application of the worldwide Living Standards Measurment Survey (LSMS) methodology implemented by the World Bank. The NHS00 survey was one of the quarterly routine surveys undertaken by the National Department of Statistics (DANE), as a follow-up of employment and other labor statistics at the household level. Table 1 shows the general characteristics of the five surveys we used for the analysis.

Table 1. Some characteristics of the five national surveys we used for the analysis.

[1] This proxy-means test is known as SISBEN and has been used mostly by the health care system to grant subsidized insurance to poor families.

Survey	Date of application	Sample size (households)	Urban/rural coverage	Purpose
Inexp8485	March 84 to February 85	26,095	Only urban	Set the baseline for CPI
Inexp9495	March 94 to February 95	28,022	Only urban	Set a new baseline for CPI
CASEN93	May 10 to August 31, 1993	24,414	Urban and rural	Design of a proxy-means test
QOL97	August 25 To Nov. 15, 1997	9,121	Urban and rural	Measuring quality of life (LSMS methodology)
NHS00	March 2000	20,337	Urban and rural	Routine follow-up of employment

Comparability of surveys

However standard the surveys were supposed to be, we found that they were not strictly comparable; the first pitfall we faced was that they did not ask the same questions about all the items, i.e., the items included in the questions were different, or showed differing degrees of disaggregation; a second pitfall was that they did not used the same reference period for OOP payments, i.e., some asked for the last thirty days (QOL97) or the past month (Inexp8485, Inexp9495), and others just for the last time the interviewee went to a provider (CASEN93 and NHS00); moreover, NHS00 asked for morbidity during the last fifteen days and then asks for payments for the last visit during that period; as an example, we show the wording of some of the questions:

- Inexp8485

  During the month of ……how much did the persons of this household pay for the following services:

  Visits to general physician
  Visits to pediatrician
  Visits to specialist physician (includes ophtalmologist, ObGyn, Psychiatrist, etc)
  Minor medical services (small surgical procedures, emergencies, etc)

  (a list of other items follows)

- Inexp9495

During the month of ……how much did the persons of this household pay for the following services:

Visits to general physician
Visits to pediatrician
Visits to specialist physician (ophtalmologist, ObGyn, Psychiatrist, etc)
Minor medical services (small surgical procedures, emergencies, etc)

(a list of other items follows)

- CASEN93

How many times did you visit someone or some facility for matters of health, dental problems, preventive services, illness or accident, during the last month?

Who did you visit?

Physician
Dentist
Nurse practitioner
Druggist
Healer, trainee
Other

How much did or will you have to pay for the last visit?

- QOL97

During the last 30 days did ……. make payments for:

Visits to physician
Dental treatment or visits
Vaccinations
Medications
Lab tests, X Rays and diagnostic tests
Transportation to the health care facility
Rehabilitation or medical therapies (respiratory, occupational, etc)
Alternative therapies (homeopathy, acupuncture, flower essences, music therapy, etc)

- NHS00

During the last 15 days …….. had some illness, accident dental problem or any other health-related problem?

How much did or will the household pay for the last health care service? (includes physician visits, tests and prescriptions).

A third pitfall was the poor information about income, beyond the well-known under-reporting problem, because many low-income rural households derive self-consumption from their crops, and urban and rural households receive in-kind payments; although some of the selected surveys collected information about self-consumption and in-kind payments, it was not collected in a strictly comparable fashion; the same pitfall applies to expenses in other items, i.e., while some surveys collected exhaustive information on them (Inexp 8485, Inexp9494 and QOL97) others did not (CASEN93 and NHS00). Table 2 summarizes the the items related to health care and their reference periods, about which information was collected in the surveys.

Table 2 Comparison of items and their reference periods for which the surveys collected information.

Item	Inexp8485	CASEN93	Inexp9495	QOL97	NHS00
Visits to Physician	Last month, all visits	Last month,last visit	Last month, all visits	Last 30 days, all visits	Last 15 days, last visit
Visits to Dentist	Last month, all visits		Last month, all visits	Last 30 days, all visits	
Prescription drugs	Last month, all prescriptions	Last month, last visit to MD	Last month, all prescriptions	Last 30 days, all prescriptions	
Lab tests	Last month, all tests	Last month, last visit to MD	Last month, all tests	Last 30 days, all tests	
X rays			Last month, all films	Last 30 days, all films	
Vaccinations	Last month, all shots		Last month, all shots	Last 30 days, all shots	
Over-the-counter Drugs	Last month, all drugs		Last month, all drugs	Last 30 days, basic items[2]	
Therapies[3]			Last 12 months, all sessions	Last 30 days, all sessions	
Prostheses, eyeglasses, etc.	Last 12 months, all items		Last 12 months, all items	Last 12 months, all items	
Admission to hospital	Last 12 months, all admissions	Last admission since July 1, 1992	Last 12 months, all admissions	Last 12 months, the most severe	Last 12 months, last admission

[2] Only first-aid kit items, like cotton, dressings, alcohol, adhesive bandages, aspirin, oral contraceptives and other items.
[3] Includes respiratory, occupational and other therapies.

In an effort to draw relevant conclusions about OOP payments, we grouped the surveys in two separate sets to achieve the highest possible degree of comparability; one set included CASEN93 and NHS00, given that they refer to the last health care event, although keeping in mind that the former asks for morbidity in the last 30 days while the latter uses 15 days as the reference period; the other set included Inexp8485, Inexp9495 and QOL97, as they refer to consumption during the last month or thirty days; from table 2, it is clear that these groups still entail subtle differences that, despite apparently irrelevant, could explain some of the findings.

Perhaps the second set of surveys (Inexp8485, Inexp9495 and QOL97) is the best to make comparisons, because the two Inexp surveys use the same methodology and the questionnaires are almost identical, except for the new household-basket items in 1994 that did not exist in the 1984 cross section; regarding QOL97, there was a deliberate effort to collect detailed information on expenses in order to estimate income from that information, and avoid the underreporting bias that usually goes with income data; this characteristic allows us to estimate total household expenses in a more comparable fashion, in order to have a reliable standard against which to compare OOP payments. Two important caveats have to be considered: on the one hand, Inexp surveys are restricted to urban households, unlike QOL97, which covers both urban and rural households; on the other hand, Inexp surveys cover one year of observations by spreading sample households through the 52 weeks of the year (one week per household), while QOL97 is undertaken during the second half of the year, which traditionally shows higher health expenditures as compared to the first half of the year.

Regarding information about income, we found the same problem, i.e. differences in items included, levels of aggregation-disaggregation, and reference periods; we then built a common cash-revenue variable that summarized information on the following cash items that were found in the five surveys:

- Salaries from main job
- Interests from investments
- Rents (from rented real estate or other assets)
- Retirement pension
- Cash transfers (from relatives, friends or institutions)
- Cash income from independent work (only for self-employed individuals)

Items such as income from additional sources (second employment, or independent extra-time work) or occasional earnings (lotteries, sales of assets, etc) were not constantly found in the surveys; accordingly, they were not included in the estimation of household cash revenues.

Statistical methods

To estimate the regressiveness of OOP payments, we used two complementary approaches; one approach is that suggested by Wagstaff and van Doorslaer (2000), which consists of estimating the Kakwani Index of progressivity; this index compares the Concentration Curve for OOP expenses (or whatever source of financing) and its corresponding Concentration Index,[4] with the Lorenz Curve for pre-payment income distribution and its corresponding Gini Coefficient. Kakwani's index of progressivity, π_K, is thus defined as:

$$\pi_K = C_{pay} - G_{pre}$$

which is twice the area between the concentration curve for OOP payments and the Lorenz curve. If OOP expenses are a progressive source of financing, the concentration curve will lie below the Lorenz curve, and π_K will be positive. On the contrary, if OOP expenses are a regressive source of financing, π_K will be negative because the concentration curve for OOP expenses will lie above the Lorenz curve. If OOP payments are perfectly correlated with income, π_K will be zero and the financing source will be proportional. One advantage of the Kakwani index over the crude concentration index is that the former controls for the distribution of income, which is the most relevant variable when it comes to define how regressive a financing scheme is; for instance, if OOP payments show a pro-poor pattern, its concentration index will be favorable and the concentration curve will lie below the diagonal; but if income shows a more concentrated pattern than that of OOP payments, the Kakwani index will take this finding into account and will unveil the truly regressive pattern of such apparently progressive distribution of OOP payments.

Once we know something about the distribution of the OOP payment burden, it is necessary to assess how this distributional pattern changes over time; it can be hypothesized that to the extent the reform achieves the substitution of insurance for OOP payments, a regressive burden will be at least reduced or at most reversed into a progressive one, provided increases in insurance coverage favor the poor. We then estimated Kakwani indices for the five cross-sectional national household surveys which cover a period of 15 years (between 1985 and 2000), and compare them within the two sets of surveys described above.

In order to control for the effect of potential differences in items included in the surveys, we estimated Kakwani indices with and without over-the-counter (OTC) drugs for Inexp8485, Inexp9495 and QOL97, because information about this this variable, although appeared in these three surveys, was less comprehensive in QOL97. In the same vein, given differences in information about income and expenses, we estimated Kakwani indices for the second set of surveys using them (income and expenses) separately. We also wanted to see if hospital-related OOP

[4] The concentration curve shows the comulative proportion of payments on the Y axis versus the cumulative proportion of households sorted by income on the X axis.

expenses had an important impact on the indices, for which we estimated the indices with and without hospital expenses.

In the second approach for the analysis, we built two-part multiple-regression models (Duan et al, 1983) intended to determine the impact of household income (proxied by total household expenses) on the share of income (expenses) that was spent on OOP payments. Several control variables were included in the model, in order to isolate the effect of income as much as possible. The specification of the two-part model is:

$$\text{Prob (having OOP payments)} = \beta_0 + \beta_1 \ln Y + \beta_2 \text{hhsize} + \beta_3 \text{prop<6} + \beta_4 \text{prop>60} + \varepsilon$$

$$\ln(\text{OOP}/Y \mid \text{OOP} > 0) = \beta_0 + \beta_1 \ln Y + \beta_2 \text{hhsize} + \beta_3 \text{prop<6} + \beta_4 \text{prop>60} + \varepsilon$$

where:

Y = household income (using household total expenses as a proxy)
OOP/Y = proportion of household income (expenses) that is spent as health related OOP payments
hhsize = number of household members
prop<6 = proportion of household members age 6 or younger
prop>60= proportion of household members age 60 or older

The model rests on the assumption that as household income increases, the proportion of income spent as OOP payments decreases, as has been shown by the evidence previosly commented here. Then we compared the predicted values for each decile of household total expenses in several surveys, to unveil any differences between the surveys.

Because the only surveys that provide complete information on expenses are Inexp8485, Inexp9495 and QOL97, we used them only and did not use either CASEN93 or NHS00 for the regression models.

Variables

As described above, we built income and expenses variables from the comparable information found in the surveys. We estimated OOP expenses for the five surveys, and then compared them to either cash-income or total household expenses for the Kakwani indices as well as for the regression models. Total household expenditures included only those items purchased outside the household, and did not include consumption of items produced within the household or items received as in-kind salary.

Income, expenses and OOP payments as a proportion of income (or expenses) showed a typical skewed-to-the-right distribution, for which we used the

logtransformation for the regression models; in the presence of extreme skewness, the effect of the logtransformation on retransformation is controlled for in the two-part model by using the smearing estimate proposed by Duan (1982).

The inclusion of Income in the denominator of the dependent variable of the double.log model raises some suspicions about perfect collinearity between the left-hand side and the right-hand side variables; however, given that the amounts of health-related cash outlays vary from household to household, we did not find that the relation between payments and income (or expenses) is totally explained by income (or expenses).

The control variables in the multivariate models aim to isolate the net effect of income (or expenses) on the proportion of that income spent as OOP payments. We controlled for household size assuming that, *ceteris paribus*, larger households showing the same amount of health-related expenses as smaller ones, actually spent less on a per-head basis; although Wagstaff et al (1999) suggest that household income should be equivalised for the effect of economies of scale in consumption (following Aronson et al), we did not use the formula they propose for such equivalization, because, as they comment, there is no consensus on the equivalence scales or the appropriate scale for each country; we then assume that there are no economies of scale in household consumption.

The proportions of six-year-old or younger and sixty-year-old or older household members, are good predictors of health expenditures, as people in these two groups are in the extremes of life, when the majority of health-related events and cash outlays take place; it could be said, for example, that if poor households have a higher proportion of pre-school-age children than the rest of the households, their OOP health expenses could appear higher were they not controlled for the fact that they have a higher proportion of individuals that are more likely to demand health care services.

RESULTS

Descriptive statistics

Table 3 shows the means, medians and standard deviations of the variables used for the analysis. Money values are in colombian pesos, and are not adjusted for the Consumer Price Index.

Table 3. Descriptive statistics of the five national surveys used for the analysis.

Survey and variables	Mean	Std dev	Median	n
lnexp8485				
Income (cash revenue)	47,328	88,316	30,667	25,713
OOP expenses (including OTC drugs and hospital outlays)	2,488	5,578	855	26,117
Number of household members	5,22	2.42	5	26,117
Proportion of members age 6 or younger	0.147	0.174	0.091	26,082
Proportion of members age 60 or older	0.087	0.187	0	26,082
OOP expenses as a proportion of income	0.074	0.309	0.026	24,820
Total expenses	75,989	91,441	49,877	26,039
OOP expenses as a proportion of total expenses	0.033	0.046	0.017	26,039
lnexp9495				
Income (cash revenue)	396,894	454,305	283,875	28,022
OOP expenses (including OTC drugs and hospital outlays)	17,266	44,632	5,680	28,022
Number of household members	4.65	2.04	4	28,022
Proportion of members age 6 or younger	0.14	0.17	0	28,022
Proportion of members age 60 or older	0.09	0.201	0	28,022
OOP expenses as a proportion of income	0.052	0.127	0.019	27,647
Total expenses	719,941	83,8151	523,930	28,022
OOP expenses as a proportion of total expenses	0.025	0.039	0.01	28,022

QOL97				
Income (cash revenue)	466,609	805,901	250,000	9,119
OOP expenses (including OTC drugs and hospital outlays)	43,761	111,780	12,500	9,119
Number of household members	4.22	2.15	4	9,119
Proportion of members age 6 or younger	0.133	0.173	0	9,119
Proportion of members age 60 or older	0.128	0.259	0	9,119
OOP expenses as a proportion of income	0.11	0.176	0.036	8,276
Total expenses	647,337	873,400	412,476	9,119
OOP expenses as a proportion of total expenses	0.073	0.112	0.03	9,117
CASEN93				
Income (cash revenue)	227,826	309,098	155,000	24,414
OOP expenses (including OTC drugs and hospital outlays)	8,844	34,840	0	24,414
NHS00				
Income (cash revenue)	736,794	1’136,778	412,532	19,735
OOP expenses (including OTC drugs and hospital outlays)	34,320	369,357	0	19,735

Table 3 (cont). Descriptive statistics of the five national surveys used for the analysis.

Kakwani index

Table 4 shows the resulting Kakwani indices for OOP payments; given that hospital expenses had differing characteristics in the five surveys, we estimated the indices with and without this item, in order to detect any relevant difference; in the same vein, we explored the effect of excluding cash outlays for OTC medications. For the second set of surveys, we estimated the indices using cash-income and expenses separately, in order to detect any difference in the use of either variable. The Gini coefficients and concentration indices were estimated for the observations grouped by income (or expenses) deciles. From this table, it can be seen that the exclusion of expenses in OTC medications does not cause major changes in the concentration index, and hence in the Kakwani index.

Table 4. Results of the Kakwani index for the five surveys analyzed.

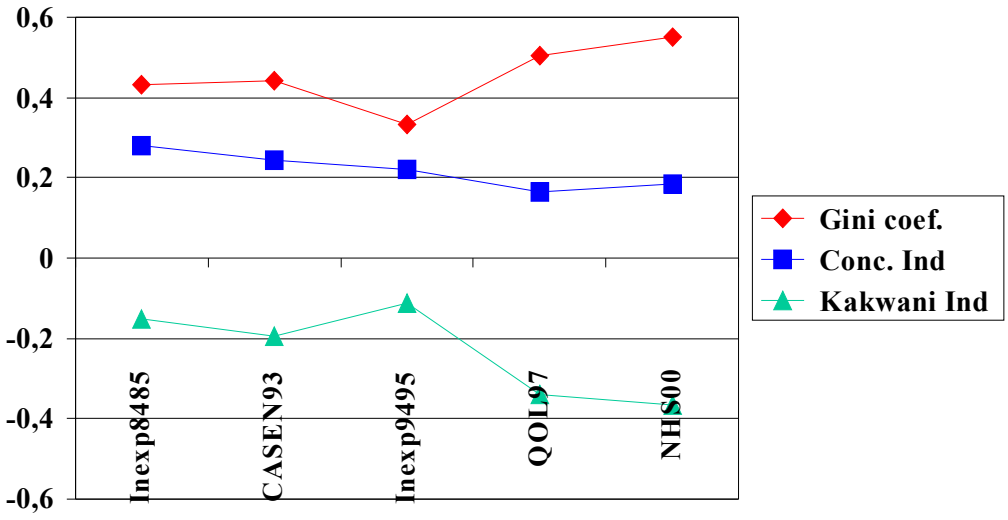
	OOP expenses without hospital expenses			OOP expenses including hospital expenses		
	Gini coefficient	Concentr. Index	Kakwani index	Gini coefficient	Concentr. Index	Kakwani index
First set of surveys						
CASEN93						
without OTC medications, vs. income	0,4404	0,2444	-0,1960	0,4404	0,2419	-0,1984
NHS00						
without OTC medications, vs. income	0,5505	0,1852	-0,3653	0,5505	0,1538	-0,3967
Second set of surveys						
Inexp8485						
without OTC medications, vs. income	0,4335	0,2806	-0,1529	0,4335	0,3078	-0,1257
with OTC medications, vs. income	0,4335	0,2654	-0,1681	0,4335	0,2924	-0,1411
with OTC medications, vs. expenses	0,4040	0,3617	-0,0423	0,4040	0,3948	-0,0092
Inexp9495						
without OTC medications, vs. income	0,3345	0,2221	-0,1124	0,3345	0,2394	-0,0951
with OTC medications, vs. income	0,3345	0,2097	-0,1248	0,3345	0,2256	-0,1089
with OTC medications, vs. expenses	0,3136	0,2578	-0,0558	0,3136	0,2785	-0,0351
QOL97						
without OTC medications, vs. income	0,5047	0,1657	-0,3390	0,5047	0,1549	-0,3498
with OTC medications, vs. income	0,5047	0,1646	-0,3401	0,5047	0,1550	-0,3497
with OTC medications, vs. expenses	0,3978	0,3553	-0,0420	0,3978	0,3583	-0,0390

Table 5 and graphs 1 and 2 show the evolution of the Kakwani index and its components, using cash-income data only. It can be seen that there is a trend towards a more negative Kakwani index, which means that OOP payments are turning more regressive. It is also evident that the exclusion of hospital OOP expenses does not cause major changes in the concentration index and, therefore, in the Kakwani index. In addition, it should be kept in mind that CASEN93 and NHS00 collect information on OOP expenses related to different items (last visit, different periods of reference); nonetheless, we show them in the same graph to show gross trends.

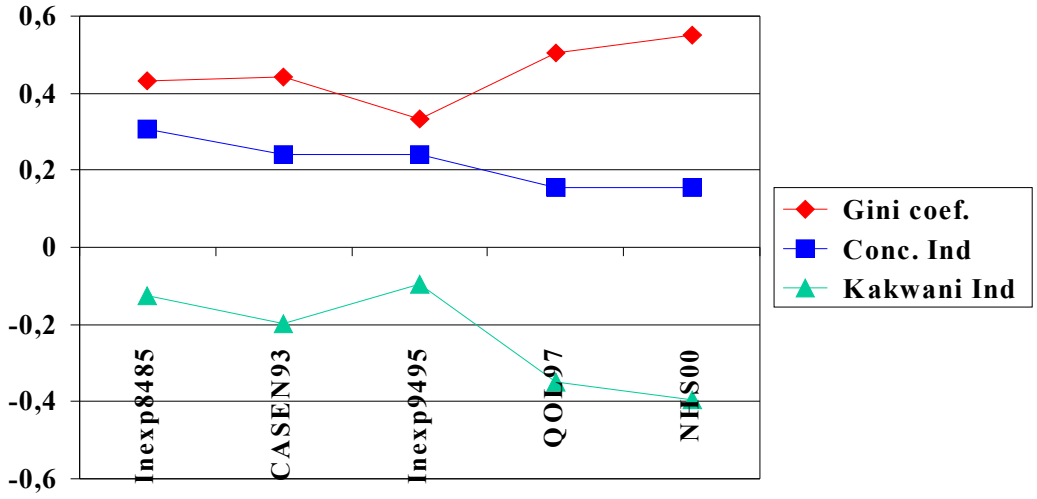
Table 5. Summary of Kakwani index results

	Inexp8485	CASEN93	Inexp9495	QOL97	NHS00
	Excluding Hospital expenses				
Gini coef.	0,4335	0,4404	0,3345	0,5047	0,5505
Conc. Ind	0,2806	0,2444	0,2221	0,1657	0,1852
Kakwani Ind	-0,1529	-0,1960	-0,1124	-0,3390	-0,3653
	Including Hospital expenses				
Gini coef.	0,4335	0,4404	0,3345	0,5047	0,5505
Conc. Ind	0,3078	0,2419	0,2394	0,1549	0,1538
Kakwani Ind	-0,1257	-0,1984	-0,0951	-0,3498	-0,3967

Graph 1. Evolution of the Kakwani index and its components (Gini coefficient and concentration index), from 1985 to 2000, excluding hospital OOP expenses and cash payments for OTC drugs, and comparing with household income.

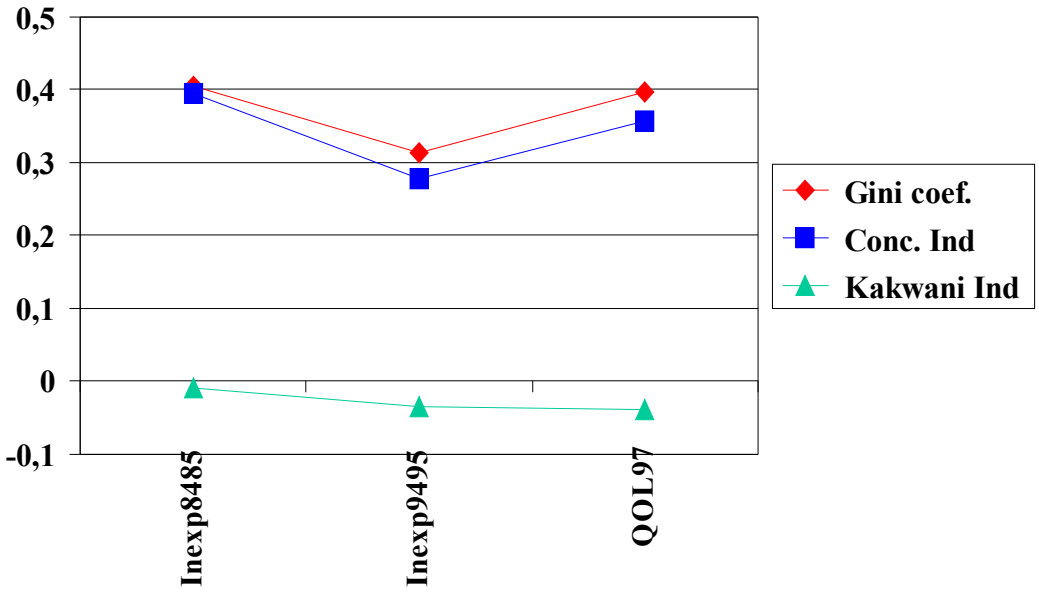


Graph 2. Evolution of the Kakwani index and its components (Gini coefficient and concentration index), from 1985 to 2000, including hospital OOP expenses but excluding cash payments for OTC drugs, and comparing with household income.



When we used expenses instead of income to estimate the Kakwani index, we were trying to control for households' proneness to under-report income; the only surveys that allowed for such comparison were Inexp8485, Inexp9495 and QOL97. Given that the exclusion of cash payments for OTC drugs and hospital expenses did not cause major changes in the indices, we only show the results of the Kakwani indices comparing total health-related OOP expenses (including OTC drugs and hospital expenses) versus total household expenses.

Graph 3. Evolution of the Kakwani index and its components (Gini coefficient and concentration index), from 1985 to 1997, including hospital OOP expenses and cash payments for OTC drugs, and comparing with household total expenses.



It is clear from the graphs and the tables, that when we use income as the comparison variable, the Kakwani index shows a regressive impact and a trend towards a more regressive impact; however, whe we use expenses as the comparison variable, the index shows an almost proportional impact, though showing a mild trend towards regressivity.

Regression analysis

For the two-part models, we tried to avoid the comparability weaknesses entailed in the use of income, so we used total household expenses from lnexp8485, lnexp9495 and QOL97 to build the proportion of those expenses that corresponded to OOP payments to health care providers, including hospital expenses. In the right-hand side of the equations, we also used total expenses variable as the main independent variable, ant the other control variables that were mentioned above.

The results of the double-log part of the model show that in lnexp8485 there is no association between household total expenses and the proportion of those expenses corresponding to OOP paymens, which is consistent with the Kakwani index using household expenses; it means that, in 1985, the burden of cash disbursments by households was distributed proportionally through deciles of expenses; however, in lnexp9495 and QOL97, although the Kakwani index is closely below zero, household expenses is statistically significant in the double-log model. Table 6 summarizes the findings of the double-log models.

Table 6. Summary of regression results for the double-log equation of the two-part model.

lnexp8485 (dependent variable: OOP expenses as a proportion of total household expenses)						
ln(OOP/Y)	Coefficient	Std err	t	*p* value	95% conf.	interval
ln Y	0,0172	0,0152	1,131	0,258	-0,0126	0,0470
hhsize	-0,0069	0,0052	-1,329	0,184	-0,0170	0,0033
prop<6	0,7181	0,0740	9,707	0,000	0,5731	0,8631
prop>60	0,6053	0,0713	8,485	0,000	0,4654	0,7451
Intercept	-4,3138	0,1672	-25,805	0,000	-4,6414	-3,9861
lnexp9495						
ln(OOP/Y)	Coefficient	Std err	t	*p* value	95% conf.	interval
ln Y	-0,1907	0,0303	-6,292	0,000	-0,2502	-0,1313
hhsize	0,0040	0,0088	0,46	0,646	-0,0132	0,0212
prop<6	0,4882	0,1173	4,161	0,000	0,2583	0,7182
prop>60	0,6310	0,1009	6,255	0,000	0,4333	0,8288
Intercept	-1,8773	0,3958	-4,743	0,000	-2,6531	-1,1015
QOL97						
ln(OOP/Y)	Coefficient	Std err	t	*p* value	95% conf.	interval
ln Y	-0,2955	0,0229	-12,931	0,000	-0,3403	-0,2507
hhsize	0,0941	0,0106	8,866	0,000	0,0733	0,1149
prop<6	0,2249	0,1287	1,748	0,081	-0,0274	0,4772
prop>60	0,5915	0,0919	6,435	0,000	0,4113	0,7716
Intercept	0,2242	0,3003	0,747	0,455	-0,3644	0,8129

Once we obtained the predicted values of OOP payments as a proportion of household total expenses (OOP/Y), we summarized the mean values for the ten deciles of total household expenses. The results are presented in table 7.

Table 7. Means and standard deviations of predicted OOP payments as a proportion of total household expenses, aggregated by deciles of expenses.

	lnexp8485		lnexp9495		QOL97	
Deciles of expenses	Mean	Std. Dev.	Mean	Std, Dev,	Mean	Std, Dev,
1	3.17%	0.69%	3.05%	0.63%	8.57%	3.43%
2	3.32%	0.60%	2.79%	0.45%	8.60%	3.10%
3	3.34%	0.57%	2.70%	0.42%	8.14%	2.67%
4	3.38%	0.56%	2.60%	0.37%	7.90%	2.50%
5	3.38%	0.54%	2.54%	0.37%	7.67%	2.46%
6	3.42%	0.55%	2.47%	0.35%	7.35%	2.20%
7	3.42%	0.50%	2.40%	0.32%	7.17%	2.45%
8	3.47%	0.50%	2.32%	0.31%	6.70%	1.83%
9	3.50%	0.50%	2.22%	0.30%	6.14%	1.83%
10	3.56%	0.46%	1.99%	0.28%	5.27%	1.43%
Total	3.39%	0.57%	2.55%	0.50%	7.54%	2.74%

The results of the regression models show that adjusted OOP payments as a proportion of total household expenses showed a mildly but nonsignificant progressive pattern in 1985, they turned regressive in 1995, and more regressive in 1997.

DISCUSSION

The results shown in the preceding section suggest that OOP payments have evolved to a more regressive pattern; this result is confirmed by three different measurements, i.e., by 1) estimating Kakwani indices using household cash income, 2) estimating Kakwani indices using household total expenses and 3) regression estimates by two-part models controlling for demographic household variables.

The evolution towards a more regressive burden has two plausible explanations; on the one hand, it could have been the case that OOP payments increased for all households, but such increases were larger for poor households and lower for the better off ones; on the other hand, it could have been the case that OOP payments decreased overall, but decreases were more substantial for rich households than for poor ones; a possible combination of these two scenarios is that OOP expenses increased for the poor but decreased for the rich.

Given the preliminary evidence from the National Department of Planning (NDP), we could argue that the substantial growth in public funds for the subsidized regimen and earmarked taxes for the contributive regimen to make possible the expansion in insurance coverage, would have caused a substitution of prepayment for OOP payments. However, if NDP's figures for OOP payments are adjusted for inflation, it is evident thar real growth has occurred; it means that households have increased the amount of money they disburse as direct payments to providers; the argument in the above paragraph would then point towards the first part of it, namely, increases in OOP payments were larger for poorer households; moreover, if we look at the evolution of the concentration index of OOP payments compared to income, it can be clearly seen that it has decreased towards the diagonal, i.e., the burden for the rich has become lower.

However, the figures in table 7 show strikingly different results, specifically when we compare QOL97 with both Inexp surveys; it is clear from the table that OOP payments as a proportion of total household expenses are much larger in the former than in the latter, a finding that demands an explanation. One possible explanation refers to stationarity problems that are better controlled for in both Inexp surveys but not controlled at all in QOL97; national health care statistics show clear spurts in utilization of health care facilities in the second half of the year, mostly related to deliveries but also to other causes of morbidity; the finding of higher expenses in 1997 could be so explained, and strengthened by the fact that both Inexp surveys show similar overall means of OOP/Y.

The slight difference between Inexp8485 and Inexp9495 regarding regressivity, would suggest that the trend towards worsening regressivity was taking place before the reform; it is important to highlight that by 1995 the reform was still embryonic: the subsidized regimen had not started to enroll people, and the new insurers in the contributive regimen were hardly increasing enrollment, mostly

explained by those who switched earlier from the erstwhile monopolistic insurers. It means that we cannot attribute any effect to the reform because by that time insurance coverage was almost unaffected.

Unfortunately, the information provided by NHS00 cannot be straightforwardly compared with previous surveys; this is a disappointing finding, because by year 2000 most of the advances in insurance coverage had already taken place, and in fact, insurance coverage is stagnant: it has not significantly advanced during the last two years as it dramatically did between 1995 and 1998. It would have been then very useful to have comparable data for more recent years.

Other relevant differences between the surveys we analyzed were commented in the methodology section; as we expected, we obtained inconsistent findings specifically related to information about income; except for the atypical fall in Inexp9495, the Gini coefficients we obtained from the five surveys show a growing trend that could be explained by the exclusive use of cash-income information; in other words, if the poor increased the share of their income that was paid in kind or if they increased auto-consumption or barter, and at the same time the rich increased their cash revenues, it is likely that the Gini coefficient would have increased in such dramatic way; however, we cannot conclude that this type of argument would support the observed increase in the Gini coefficient.

The pitfalls we faced in the comparison of five surveys that had been originally designed for other purposes, are not uncommon though. Berk and Schur (1998) had already underscored the difficulties inherent to the use of health surveys for health policymaking in their comment on the problem of measuring access to health care; the same argument they make for access can be made for OOP expenses, namely, the "lack of agreement about standards for measuring [OOP expenses] from an operational point of view and a lack of consensus about the conceptual definition of [OOP expenses]" The authors point to differences in wording that no matter how slight, can affect survey responses; they also mention the conditioning effects found in long surveys *vis a vis* shorter ones, the former being more prone to under-reporting as compared to the latter.

Colombia does not carry out routine Healht surveys like US's National Medical Expenditures Survey or National Health Interview Survey;[5] in the absence of such routine surveys, we have to limit ourselves to the available information from surveys designed for other purposes, which means that our ability to compare data from one survey to another is somehow restricted.

Beyond the intricacies of comparing non-strictly comparable surveys, we conclude from this study that the expected impact of prepayment on households' direct payments to providers has not taken place to the extent we assumed; the regressivity of OOP expenses has not been reversed by the reform, and, on the

[5] Three national Demography and Health Surveys have been carried out on a quinquennial basis (1990, 1995 and 2000), but they focus mostly on maternal and child health, reproductive health and domestic violence issues. In addition, a National Health Survey was carried out in 1977 but was not repeated thereafter.

contrary, it seems that it is worsening, athough we cannot conclusively say that net cash outlays as OOP expenses have decreased. We also recommend the design of a national health survey to be applied on a regular basis, or at least the design of a standard set of questions to include in other-purpose surveys, in order to collect relevant and comparable information for this and other kinds of analyses.

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