

# Mental Health Service Delivery Following Health System Reform in Colombia

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## Abstract

**Background:** In 1993, Colombia underwent an ambitious and comprehensive process of health system reform based on managed competition and structured pluralism, but did not include coverage for mental health services.

**Aims of the Study:** In this study, we sought to evaluate the impact of the reform on access to mental health services and whether there were changes in the pattern of mental health service delivery during the period after the reform.

**Methods:** Changes in national economic indicators and in measures of mental health and non-mental health service delivery for the years 1987 and 1997 were compared. Data were obtained from the National Administrative Department of Statistics of Colombia (DANE), the Department of National Planning and Ministry of the Treasury of Colombia, and from national official reports of mental health and non-mental health service delivery from the Ministry of Health of Colombia for the same years.

**Results:** While population-adjusted access to mental health outpatient services declined by -2.7% (-11.2% among women and +5.8% among men), access to general medical outpatient services increased dramatically by 46%. In-patient admissions showed smaller differences, with a 7% increase in mental health admissions, as compared to 22.5% increase in general medical admissions.

**Discussion:** The health reform in Colombia imposed competition across all health institutions with the intention of encouraging efficiency and financial autonomy. However, the challenge of institutional survival appears to have fallen heavily on mental health care institutions that were also expected to participate in managed competition, but that were at a serious disadvantage because their services were excluded from the compulsory standardized package of health benefits. While the Colombian health care reform intended to close the gap between those who had and those who did not have

access to health services, it appears to have failed to address access to specialized mental health services, although it does seem to have promoted a change in the pattern of mental health service delivery from a reliance on costly inpatient care to more efficient outpatient services.

**Conclusions:** Health reform in Colombia improved access to health services for the general medical services, but not for specialized mental health services. Although the primary goal of the health reform was to provide universal medical coverage, by not including mental health services in the standardized benefits package, inequities in the delivery of mental health services appear to have been perpetuated or even exacerbated.

**Implications for Health Care and Policy Formulation:** If health reform in Colombia and elsewhere is to provide universal coverage and adequate access to comprehensive health care, mental health services must be added to the standardized package of health benefits and efforts to develop accessible and effective mental health treatment at the primary care level should continue.

**Implications for Future Research:** Mental health services research in Colombia should focus future studies on the differential impact of health reform on access to mental health services across regions, and between urban and rural areas.

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## Introduction

In the 1990's, two major events, one international and one domestic, stimulated the Government of Colombia to implement a reform of its National Health System. First, the World Health Organization's Ottawa Charter<sup>1</sup> recommended that all countries increase their health promotion and disease prevention efforts to address the needs of their entire population. Second, in Colombia, a new Political Constitution, ratified in 1991, redefined health as an economical, cultural and social right for all citizens and legal aliens.<sup>2</sup> In response to these developments, the Colombian Government implemented a comprehensive reform of its Social Security Health System (SSHS) through National Law 100, which was signed into Law in 1993. This law granted to both citizens and legal aliens the right to receive health promotion, disease prevention and emergency services without additional personal charges, and to freely select a

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health provider who would deliver a basic health benefit package at an affordable cost.

*Health Promotion* was defined in the text of Law 100 as a series of inter-sectorial actions carried out with community involvement and designed to enhance general awareness and material conditions that would facilitate control over personal, environmental, and community health.

*Prevention* was promoted as a series of actions oriented to reduce damage to health, or to reduce the incidence of disorder, its propagation, or the occurrence of sequelae.

*Emergency services* were defined as actions performed in the emergency room oriented to increase the survival of critically ill patients, and to reduce the morbidity and mortality associated with such disorders. Tangible and direct services that were provided in emergency rooms were to be charged to the client's health insurance, which had two different funding sources (contributory and solidarity funds).

In addition to instituting a universal right to basic health care services, this law also required the health system to contain costs while improving access to health services by implementing a funding system based on managed competition as originally proposed by Alain Enthoven.<sup>3-7</sup>

One decade after the implementation of this reform, the World Health Organization reported that the Colombian Health system reform had been a success, especially in the fairness of the system of financial contributions, since people with low incomes pay the equivalent of only one dollar per year for health care, while those with higher incomes would pay \$7.60 for the same service.<sup>8</sup> One study<sup>9</sup> has shown that between 1993, when the reforms were initiated, and 1997, the national health insurance coverage in Colombia increased from 12% to 59%, while another study<sup>10</sup> showed that during this same period inflation adjusted costs did not increase. The major increase in access appeared to occur primarily among the 8 million Colombians who previously had little or no access to health care. The system thus remained affordable even in the context of expanding service availability in the perspective of an uncertain economy.<sup>11</sup>

While these studies addressed the impact of reforms on general health care service delivery, they did not consider the impact of the reform on vulnerable populations such as people with mental illness. Major changes in health care systems can have significant adverse effects for vulnerable, stigmatized or costly populations, such as people with serious mental illness.<sup>12,13</sup>

This study uses national health statistics to evaluate changes in mental health service delivery in Colombia before and after the introduction of managed competition and provides comparative data on the delivery of general medical services. It addresses three questions: (i) Did the change in Colombia's health care system increase access to mental health services? (ii) Were changes in mental health services similar to changes in general medical services? (iii) Was there a change in the pattern of service delivery such that expensive inpatient services were replaced with more efficient outpatient services?

## Background

### *Description of the Colombian Social Security Health System (SSHS)*

The funding of the Colombian health reform was based on both the model of managed competition initially proposed by Enthoven<sup>3-7,14</sup> and, for its policy setting mechanism, on a system of structured pluralism.<sup>15</sup>

The health care system was funded through the creation of an affordable, employment-based payment schedule, which taxed 8% of personal salaries to employees and 12% of all personnel costs to employers. This taxation also allowed disabled, unemployed and part time workers, as well as those whose average household monthly income is less than twice the minimum wage, to be covered by the system at no personal cost. Through this solidarity fund the system provides primarily primary care services, but also, prenatal, pediatric, gynecologic, obstetric, and general surgical services to low income persons.

There are four main operative components of the system. (i) First, a National council oversees the operation of the system, is responsible for designing the standardized package of benefits, and for establishing the annual per capita (PCU) funding rate that the System offers to Health Promotion Companies.<sup>16</sup> This Council also sets the minimum reimbursement rates that the Health Promotion Companies must pay to health providers. (ii) The second component consist of nineteen private and public Health Promotion companies (purchasing cooperatives) that have an incentive to enroll as many customers as possible and to provide at least the minimum required level of services at the lowest possible cost. (iii) The third component consists of Health Providers (i.e. medical offices, hospitals, clinics, laboratories) who directly deliver the services and, (iv) the fourth component is an independent quality control agency, which is operated by the National Government and which establishes the minimum standards of services delivery. This agency also monitors the fiscal health of the purchasing companies to prevent excessive risk-taking that could jeopardize the continuous provision of services. The quality control agency, in collaboration with the National Council establishes regulations and standards to assure adequate quality of care, and to prevent abuse of the market.

Although, mental health services were not included in the basic health benefit package it was hoped that Health Promotion Companies would be motivated to attract additional subscribers, and thus achieve a competitive advantage, by offering supplemental mental health services. Health reform in Colombia included goals that are broadly related to mental health such as promoting harmonious interpersonal relationships, increasing awareness of safe sexual practices, fostering healthy and comprehensive child development, and reducing both licit (e.g. alcohol & tobacco) and illicit (e.g. cocaine) substance use. However, it did not include direct provision of mental health services in its benefit package.

## Methods

### *Source of Data and Measures*

We used national demographic and economic indicators for the years 1987 and 1997 from the National Administrative Department of Statistics of Colombia (DANE),<sup>17</sup> the Department of National Planning,<sup>18</sup> and the Ministry of the Treasury.<sup>19,20</sup> National data on mental health services were obtained from two official reports<sup>21,22</sup> that compiled relevant information from all private and public psychiatric institutions using a structured questionnaire. These two reports documented: (i) the total number of operating psychiatric beds; (ii) the number of beds allocated for acute and chronic patients; (iii) the number of beds located in psychiatric institutes and attached to general medical hospitals; (iv) the number of psychiatric admissions; (v) the average lengths of stay per episode of care; (vi) the number of outpatient visits provided; (vii) the number of outpatients treated or first outpatient visit for these years. We used data from 1993 for general medical out-patient visits and in-patient admissions because equivalent data were not available from 1987.<sup>9</sup>

We measured change in access to services by comparing the per capita rates of use of general health and mental health services. This rate is the total number of services or clients (i.e. annual inpatient admissions, annual outpatient visits, etc) divided by the total population for those years. This result is then multiplied by 10,000 and represents the annual population-based use of each particular service (i.e. outpatients treated, inpatients treated, etc.) and provides a population standardized measure of access.<sup>23</sup>

## Results

The population of Colombia increased by 17.7% during the decade from 1987 and 1997. During the same period, the national income increased from an initial 1987 Gross National Income (GNI) of US\$ 33,460 million and an annual Per Capita Income (PCI) of US \$1,015 dollar to a 1997 inflation-adjusted Gross National Income of US\$ 51,160 million with an annual per capita income of US \$1,277. This represents a 34.5% increase of the GNI and a 20.5% increase of the PCI for this 10-year period.

The structural change in mental health services during the decade were remarkable for a fairly stable number of psychiatric hospitals (from 32 to 35), a decrease in the number of outpatient clinics (from 78 to 66), and a dramatic increase of substance abuse programs (from 47 to 139), for the years 1987 and 1997 respectively. The role of primary care in the treatment of mental illness was encouraged and promoted, but no consistent effort was maintained until after the national policy on mental health and substance abuse was published in 1998.<sup>24</sup>

As shown in **Table 1**, although there was a 39.2% decrease in the total number of psychiatric beds, there was a 24% increase in the number of total mental health in-patient

admissions, probably due to the more than a 120% decrease in the average length of stay. Most of the reductions in psychiatric beds were in psychiatric institutions (-45.4%) and involved chronic patients (-66%). In contrast, general medical in-patient admissions increased by 33.2 % from 1993 to 1997. When population standardized rates were compared, general medical in-patient admissions increased three times more than admission for mental health (22.5% vs. 7.5%) (**Table 2**).

While the total number of mental health outpatient visits only increased by 15.3%, an increase that was substantially greater among men (21.8%) than among women (9.3%), the number of general medical outpatient visits increased by 53.5%. However, the number of annual mental health outpatient visits per patient decreased by 12.5 % from 3.6 to 3.2 visits per year (**Table 1**). When these percentages are standardized to the population for each corresponding year, the total number of mental health outpatient visits decreased by 2.7% (-11.2% among women and +5.8% among men), while general medical outpatient visits increased substantially by 46% (**Table 2**).

As shown in **Table 2**, there was a remarkable 77.7% decrease in the population standardized availability of psychiatric beds with a subsequent 3.3 % increase in the number unique outpatients per 10,000 population. Although, there was a 2.7% decrease in the total number of outpatient visits, this reduction was strongly dependent on the reduction in the number of outpatient follow-up visits. This trend suggested an improvement in the efficiency of mental health services delivery and not a change in the pattern of services.

## Discussion

This study demonstrates that the Colombian health reform of 1993 was associated with an increase in access to general medical services, but not to mental health services, most likely because mental health services were not directly covered by the Colombian health reform. The health reform imposed competition across all health institutions with the intention of encouraging access efficiency and financial autonomy. However, the challenge of institutional survival appears to have fallen heavily on mental health institutions that were also expected to participate in managed competition, but that were at a serious disadvantage because their services were excluded from the compulsory standardized package of health benefits. While the Colombian health care reform intended to close the gap between those who had and those who did not have access to health services, it appears to have failed to address access to specialized mental health services, although it does seem to have promoted efficiency of mental health service delivery. However, the reduction in outpatient service intensity (visits per patient), and population-based access among women, suggests that people with mental illness may have disproportionately footed the bill and burdens associated with the expansion of general medical services.

Table 1. Change in Mental Health Services Delivery from 1987 to 1997 and in General Medical Services Delivery from 1993 to 1997, Colombia.

Variables	1987	1993	1997	D(97 -87) D(97-93)	% Change
<b>General indicators</b>					
Population	32,963,445	34,534,000	40,064,092	7,100,647	17.7
Males	16,250,978		19,571,309	3,320,331	16.9
Females	16,712,467		20,492,783	3,780,316	18.4
GNI adjusted by inflation (millions of dollars)*	\$ 33,460		\$ 51,160	\$ 17,700	34.5
Annual income per capita adjusted by inflation**	\$ 1,015		\$ 1,277	\$ 262	20.5
<b>Mental health services</b>					
Total number of psychiatric beds	5,489		3,941	-1,548	-39.2
Beds allocated for: acute patients	3,674		2,853	-821	-28.7
chronic patients.	1,815		1,088	-727	-66.8
Beds located in: psychiatric institutions	5,146		3,539	-1,607	-45.4
general hospitals	343		402	59	14.6
Total in-patient admissions	21,808		28,727	6,919	24.0
New admissions	18,474		24,627	6,153	24.0
Re-admissions	3,334		4,100	766	18.6
Duration of admission (mean days)	99.6		45.1	-54.43	-120.0
Total outpatient visits.	208,258		246,039	37,781	15.3
Gender: Male outpatient visits	92,316		118,199	25,883	21.8
Female outpatient visits	115,942		127,840	11,898	9.3
Unique outpatients	57,109		72,074	14,965	20.7
Outpatient visits per patient/year	3.6		3.2	-0.4	-12.5
<b>General medical service (N)***</b>					
Total in-patient admissions		937,369	1,404,289	466,920	33.2
Total outpatient visits		2,515,384	5,411,803	2,896,419	53.5

\* In million of dollars adjusted for 1987 dollars.

\*\* In dollars adjusted for 1987 dollars.

\*\*\* Data from 1993 and 1997 taken from Sanchez.<sup>9</sup>

### *Access to Mental Health Services*

While Colombian health reform facilitated the enrollment of 8 million people in health insurance plans and improved access to general health care,<sup>25</sup> successfully reducing inequalities of access to general health care, it may have, however unintentionally, impaired relative access to mental health services. This study showed that although the population standardized rates of inpatient admissions to mental health institutions increased by 7.5% and length of stay dropped by 120%, mental health outpatient visits per 10,000 population decreased by -2.7% after the reform. In addition to the reduction in access to outpatient services by -2.7%, there was also a 12% decline in the number of mental health outpatient visits per patient to 3.2 visits per year. Data from countries that have included mental health services in

their standardized packages of health benefits show that such patients have an average of 14 visits per year, over four times the number in Colombia.<sup>26</sup>

### *Pattern of Mental Health Service Delivery*

The pattern of mental health delivery did not appear to have shifted emphasis from inpatient to outpatient care. However, the reduction of inpatient beds has placed Colombia at 0.09 beds per 1000 habitants, a level that is below the recommended international standard of 0.25 beds per 1000 habitants.<sup>27</sup> Even if the number of psychiatric beds in 1997 was adequate to meet the needs of those who received mental health services, it is likely to have been insufficient to meet the needs if mental health services had been included in the reform, thus increasing access to mental health services more generally.

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Table 2. Change in Health Services Delivery per 10,000 Habitants from 1987 &amp; 1993 to 1997, Colombia.

Variables	1987	1993	1997	D(97 -87) D(97-93)	% Change
<b>Mental Health</b>					
Total number of psychiatric beds	1.6		0.9	-0.7	-77.7
Beds allocated for:					
acute patients	1.1		0.7	-0.4	-57.1
chronic patients.	0.5		0.2	-0.3	-150.0
Beds located in:					
psychiatric institutions	1.5		0.8	-0.7	-87.5
general hospitals	0.1		0.1	0.0	0
Total in-patient admissions	6.6		7.1	0.5	7.5
New admissions	5.6		6.1	0.5	8.1
Re-admissions	1.0		1.0	0.0	0
Total outpatient visits.	63.1		57.6	-5.5	-2.7
Gender:					
Male outpatient visits	56.8		60.3	3.5	5.8
Female outpatient visits	69.3		62.3	-6.9	-11.2
Unique outpatients	17.3		17.9	0.6	3.3
<b>General Medical Health</b>					
Total in-patient admissions		271.4	350.5	79.0	22.5
Total outpatient visits		728.3	1,350.7	622.4	46.0

### *Enhancement of Primary Care Services*

The health reform may also have enhanced use of primary care services to provide mental health services. However, two research studies conducted prior to the reform<sup>28,29</sup> showed that 90% of new attendees at a primary care outpatient clinic in Bogota-Colombia, in which a high prevalence of moderate to severe psychopathology was documented, were not diagnosed or treated for mental illness by their primary care physicians. The results of these studies suggest that although the reform may have expanded primary care services, this is unlikely to have addressed the need for mental health services.

### *Limitations*

The primary methodological limitation of this study is that the data used for comparison before and after the health reform is based on National Statistics that rely heavily on the accuracy of the medical information systems. It is possible that data collection on the use of general medical services improved after the reform thus artificially increasing the apparent level of service delivery. However, we addressed this problem by using two reports that collected data about mental health services delivery that was independent from the influence of any reimbursement agency. Second, while we used four years after the implementation of the health reform as the cut-off year for our evaluation, it is possible that there have been further gains in mental health service delivery in Colombia since 1997, when our data ends.

### **Conclusions**

The health reform in Colombia successfully improved the access to general health services,<sup>25</sup> but not for mental health services. The principals of managed competition included in the health reform may have also promoted efficiency-promoting competition between institutions, but our results suggests mental health institutions may have had to reduce services or deny access in order to remain in business. It is possible that enhancement of primary care services may have provided mental health services, but this was not documented. If the health reform in Colombia is to provide universal coverage and adequate access to comprehensive health care, mental health services must be added to the standardized package of health benefits. This exclusion of this population may have perpetrated or even exacerbated inequities and inequalities for people who have a mental illness.

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## References

1. Ottawa Charter for Health Promotion. *Bull Pan Am Health Organ* 1987; **21**: 200-204.
2. Republica de Colombia. Constitucion Politica. Titulo II Capitulo II Art. 45-47. 1991. Bogota.
3. Enthoven A. Managed competition of alternative delivery systems. *J Health Politics Policy Law* 1988; **13**: 305-321.
4. Enthoven AC. Consumer-Choice Health plan (second of two parts). A national-health- insurance proposal based on regulated competition in the private sector. *N Engl J Med* 1978; **298**: 709-720.
5. Enthoven AC. Consumer-choice health plan (first of two parts). Inflation and inequity in health care today: alternatives for cost control and an analysis of proposals for national health insurance. *N Engl J Med* 1978; **298**: 650-658.
6. Enthoven AC. Managed competition in health care and the unfinished agenda. *Health Care Financ Rev* 1986; (Spec No): 105-119.
7. Enthoven AC. Managed competition: an agenda for action. *Health Aff (Millwood)*. 1988; **7**: 25-47.
8. World Health Organization. *The World Health Report 2000. Health Systems: Improving performance*. 2000. Geneve, World Health Organization.
9. Sánchez F and Nuñez J. La ley 100 si llegó a las personas de menores ingresos. *Via Salud.Gestión, calidad y logros* 1999; **9**: 1-12.
10. Gutierrez C Wüllner A, and Molina CA. *Las formas de contratacion entre las administradoras y prestadoras de salud : perspectivas bajo el nuevo marco de la seguridad social en Colombia*. 1995. Santafé de Bogotá, Fundación Corona, FES, Fundación Restrepo Barco y Fundación Social.
11. Savedoff W D. *Reaching the poor through demand subsidies: The Colombian health Reform*. Discussion paper. 2000. Washington, D.C, Inter-American Development Bank.
12. Rosenheck RA. Principles for priority setting in mental health services and their implications for the least well off. *Psychiatr Serv* 1999; **50**: 653-658.
13. Rosenheck R, Armstrong M, Callahan D, Dea R, Del Vecchio P, Flynn L, Fox RC, Goldman HH, Horvath T, Munoz R. Obligation to the least well off in setting mental health service priorities: a consensus statement. *Psychiatr Serv* 1998; **49**: 1273-74, 1290.
14. Enthoven AC. The history and principles of managed competition. *Health Aff* 1993; **12** (Suppl): 24-48.
15. Londono JL, Frenk J. Structured pluralism: towards an innovative model for health system reform in Latin America. *Health Policy* 1997; **41**: 1-36.
16. Newman.P. Interview with Alain Enthoven: Is there convergence between Britain and the United States in the organization of health services? *Br Med J* 1995; **310**: 1652-1655.
17. Departamento Administrativo Nacional de Estadística-DANE 2001-*Documentos*. Republica de Colombia. <http://www.dane.gov.co>.
18. Departamento Nacional de Planeación. *Indicadores Macroeconómicos*. 2001. Presidencia de la Republica. Republica de Colombia. In: <http://www.dnp.gov.co>
19. Ministerio de Hacienda y Credito Publico. 2001. *Republica de Colombia. Documentos*. <http://minhacienda.gov.co>.
20. Departamento Administrativo Nacional de Estadística-DANE <http://www.dane.gov.co> UMACRO. 2001. Republica de Colombia.
21. Luna-Acosta, JA., de Santacruz C, Posada, Posada M. *Macrodiagnóstico de Salud Mental - Subsectores Directo y Privado 1986-1987*. 1988. Bogotá, Republica de Colombia. Ministerio de Salud.
22. Luna-Acosta, J. A. *Diagnóstico Situacional y analisis de la oferta institucional en Salud Mental*. Documento Interno de trabajo. Lozano, A., Romero G.M, Parra. A., and *et al*. 1998. Bogotá, Republica de Colombia. Ministerio de Salud, Programa de Comportamiento Humano.
23. Weissman E, Pettigrew K, Sotsky S, Regier DA. The cost of access to mental health services in managed care. *Psychiatr Serv* 2000; **51**: 664-666.
24. Republica de Colombia. Ministerio de Salud. Política Nacional de Salud Mental. *Resolución 2358 de Julio 28 de 1998*. Diario oficial N0 43168. Imprenta Nacional.
25. Plaza B, Barona AB, Hearst N. Managed competition for the poor or poorly managed competition? Lessons from the Colombian health reform experience. *Health Policy Plan* 2001; **16** (Suppl. 2): 44-51.
26. Bovier PA, Chamot E, Eytan A, Perneger TV. Patterns of use of ambulatory mental health services in a universal care setting. *Psychiatr Serv* 2001; **52**: 1515-1520.
27. World Health Organization (WHO). *Global action for the improvement of mental health care: policies and strategies*. 1996. Geneva, World Health Organization., WHO/MNH/MND/96.4.
28. Romero GM, Gonzalez G, Rojas JC, Ballesteros J, and Ramirez M. Prevalencia de psicopatología en 142 usuarios nuevos en el servicio de consulta externa de medicina general del centro de salud No.6. *Revista del Hospital Mental de Antioquia* 1990; **17** (1): 16-20.
29. Romero G.M. and Gonzalez G. Prevalencia de psicopatología en 142 usuarios nuevos en el servicio de consulta externa de medicina general del centro de salud no. 6 (segunda parte): porque los medicos generales no detectan posibles casos de trastornos mentales en sus pacientes. *Revista del Hospital Mental de Antioquia* 1990; **17** (1): 22-39.