Manager's Leadership Is the Main Skill for Ambulatory Health Care Plan Success

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Abstract: To demonstrate effectiveness of ambulatory health care plan implementation among institutions and variables associated with the differences observed. Randomized selection of primary health care (PHC) centers was done. Leadership ability of the plan manager was explored. Univariate/bivariate analyses were performed to observe correlation between variables. Two groups of PHC centers were established according to the efficacy of plan implementation: high and low performance. Differences between groups were observed (592%-1023% more efficacy in controls and practices; $P < .001$). Leadership was responsible for the main differences observed. Leadership of manager for implementation of the health care plan was the major important variable to reach the best efficacy standards. **Key words:** *health, leadership, model, Plan Nacer, service*

THE HEALTH CARE SYSTEM in Argentina is a mixed system, comprising 3 subsectors: state, social security, and private subsector (Belló & Becerril-Montekio, 2011). The state subsector is organized on the basis of health care services centered in hospitals and primary care institutions. The health agents of this system are rewarded monthly for providing services only to the population that demands it (Marin et al., 2006, 2008, 2009, 2011).

Hence, this model has led the health care team not only to become careless about health care goals in relation to their patients but also to refuse to attend to their demand, since the agents are paid with a fixed salary whether they attend their patients or not, discouraging all motivation, at least monetary incentives (Rosenberg & Andersson, 2000; Vargas et al., 2008).

Plan Nacer is a proposal of the National Ministry of Health to solve the last problem, establishing the idea of granting monetary incentives to workers from the public primary health care (PHC) centers that meet with certain goals for their patients. These health team members must provide personalized medical examinations and controls, vaccination, or prevention activities to their target population.

The national government assigns a fixed amount of money per beneficiary who lives in the Buenos Aires territory and transfers the money of the millions of patients' beneficiaries of "Plan Nacer." Then, the provincial government transfers this money to PHC teams for each control, service, practice, or supply provided to patients from a list of patients under their care. This system forces the PHC agents to follow-up and provide medical checkups, vaccination, and prevention

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services to their beneficiaries. Each team receives monetary rewards if it complies with the expected controls and practices or is punished with a reduction in the money transfer if the goals are not achieved.

Today, 5 years have passed since the beginning of Plan Nacer. At this point, it is important to analyze some aspects regarding performance of the plan, achievements, obstacles, strengths, and weaknesses in order to understand whether that monetary incentive is enough to change health teams' attitude. A preliminary analysis detects a great heterogeneity in the results obtained by the different PHC centers. This aspect represents major interest, since PHC centers studied in this article have identical infrastructure, human resources, and target population.

This study was conducted to analyze the impact of monetary incentives on health teams for goals accomplished through testing the implementation of Plan Nacer in PHC institutions and determining the importance of medical officers' leadership skill in health program success.

MATERIALS AND METHODS

Type of study

This is a cohort study that compares the health care results obtained through a program that encourages PHC agents to meet health goals in a target population.

Sample-universe-population goal

The universe was made up of 45 municipal PHC centers located in La Plata, the state capital of Buenos Aires, that simultaneously started implementation of Plan Nacer in 2007. All PHC centers had similar facilities and human resources (similar number of health care professionals and medical and nonmedical specialty agents) and similar building structures. A random sample was obtained from these 45 PHC centers. The unit of analysis was each PHC center and the agents working in them. For the selection, the following formula was used to calculate the proportion of finite populations, determining an expected prevalence of incorrect behavior (P) of 15%, a P of 5%, and a sensibility of 20%:

$$n = \frac{NZ^2PQ}{d^2(N-1) + Z^2PQ}$$

Period of time

Primary health centers were analyzed during 5 years of implementation of the program from June 2007 to June 2012.

Variables

Independent variable

Leadership skill of the plan managers was objectively measured by a variable comprising 4 dimensions (general management ability, plan management, commitment, and interest). Table 1 shows the operationalization of this independent variable with the instruments and sources of correlation of the information. Each dimension was assigned a minimum of zero point and a maximum of 10 points that were derived from the average of instruments of measurement (each item was analyzed using a range between 0 and 3.33 points). The final score given to each manager was the average value obtained in each of the 4 dimensions (range, 0-10). The cutoff point between a good and a lousy manager was 6 points (>6 was considered a good manager and <6 a lousy one).

Dependent variables

Fiscal reports of the plan are expressed in local currency "pesos" (invoiced amount and the total amount of money obtained by each center, and goods and acquisitions achieved with that money). Health care services and practices provided to the target population by PHC centers were codified and are shown in Tables 2 to 5 as health tracers. These health tracers were measured by the analysis of 3 reference months and were randomly selected from 1 year of the period of time of plan implementation. The months taken as reference were February, June, and October of 2009. Hence, each health institution had a number of services and practices given in these months to their beneficiaries. In this way, by assigning a cutoff point to each tracer, it

Table 1. Leadership Qualities of the Responsible Agent for the Plan[a]

Variable	Dimensions	Measurement Instruments	Construct	Source of Information	Values	
Leadership of the PHC's medical officer	Management ability	Survey to workers	Opinion of subordinates regarding the PHC medical officer's ability to solve problems	100% staff of the health center	0%-3.33%	0-10
		Survey to actors of the community	Opinion of representatives of community organizations on the PHC medical officer's ability to summon and execute joint activities	School headmasters of the area, local representatives, and neighborhood associations	0%-3.33%	
		Survey to public staff	Opinion of superior officers directly related to the PHC's medical officer regarding his or her ability to solve problems and to execute programs and activities derived from the central level	Superior officers directly related to the PHC's medical officer	0%-3.3%	
	Plan management	Registration	Percentage of achievement according to what was stipulated	Analysis of plan data	0%-3.3%	0-10
		Tracer's measurement	Accomplishment of each of the goals of the plan	Analysis of the plan data	0%-3.33%	
		Administration	Administrative accomplishment of the tasks corresponding to the plan, in due time and manner	Document analysis	0%-3.33%	
	Commitment	Interview to workers	Opinion of the workers regarding the time devoted by the PHC's medical officer to the plan, staff assigned to the plan, and the PHC medical officer's willingness to fulfill the plan goals	100% staff of the health center	0%-3.33%	0-10

(continues)

Table 1. Leadership Qualities of the Responsible Agent for the Plan[a] (*Continued*)

Variable	Dimensions	Measurement Instruments	Construct	Source of Information	Values
		Interview to actors of the community	Opinion of the actors of the community regarding the time devoted by the medical officer to the plan, the PHC medical officer's willingness to receive doubts, criticism, and suggestions	School headmasters of the area, local representatives, and neighborhood associations	0%-3.33%
		Interview to public servants	Opinion of the public agents regarding the time devoted by the PHC's medical officer to accomplish the goals of the plan	Superior officers directly related to the PHC's medical officer	0%-3.33%
	Interest	Interview to workers	Opinion of the workers regarding changes to improve the plan, inclusion of workers into the benefits of the plan	100% staff of the health center	0%-3.33% 0-10
		Interview to actors of the community	Opinion of the actors of the community regarding the ideas and activities performed at the center to improve commitment to the plan	School headmasters of the area, local representatives, and neighborhood associations	0%-3.33%
		Interview to public agents	Opinion of the public agents regarding the ideas and activities performed at the health center to improve commitment to the plan; attendance of the medical officer to meetings concerning the plan	Public agents in charge of the plan	0%-3.33%

[a]Leadership of the PHC's medical officer was analyzed by 4 dimensions: management ability, plan management, commitment, and interest in the plan. Each of 4 dimensions was explored by 3 different items using instruments such as surveys, interview, and tracer data analysis. Each 1 of the 3 items was weighted with a value from 0% to 3.33%; therefore, each dimension could have a score from 0 to 10. The final score given to each manager was the average value obtained in each dimension (range, 0-10). The cutoff between a good and a lousy manager was 6 points (>6 was considered a good manager and <6 a lousy one).

Table 2. Results of the Health Care Practices Provided at the Health Centers Included in the Present Study[a]

Health Institution (PHC) Analyzed	Health Tracers									
	NPE32	NPE33	NPE41	NPE42a	NPE42b	NPE42c	NPE42d	NPE42e	MEM1	MEM2
A	67	97	9	49	33	11	6	6	4	57
B	346	320	60	127	94	22	31	2	66	379
C	744	779	68	253	202	95	58	5	63	398
D	263	245	92	187	142	35	48	5	90	382
E	40	113	6	17	12	5	6	0	22	172
F	838	781	82	320	238	72	79	5	75	487
G	171	135	15	63	55	7	13	0	17	95
H	139	139	32	116	83	0	31	2	58	317
I	309	359	64	140	95	42	37	4	102	431
J	5	9	4	16	6	3	2	3	69	387

Abbreviation: PHC, primary health care.

[a]The health tracer codes correspond to each medical care or practice given to beneficiaries of the plan (NPE32: pediatric consultation in children younger than 1 year; NPE33: pediatric consultation in children aged 1-6 years; NPE41: doses of triple viral vaccine given to children younger than 6 years; NPE42a: doses of Sabin vaccine given; NPE42b: doses of pentavalent vaccine; NPE42c: doses of quadruple vaccine; NPE42d: doses of hepatitis vaccine; NPE42e: doses of triple bacterial cell vaccine; MEM1: first-time prenatal control; MEM2: subsequent prenatal control). Each health institution (PHC center) analyzed is identified by a capital letter. The numbers of the table correspond to the quantity of practices or patients seen by each health institution in the months and year randomly taken as reference for this analysis.

Table 3. Results of the Health Care Practices Provided at the Health Centers Included in the Present Study According to the Cutoff Point of the Health Care Tracer[a]

	PHC	NPE32	NPE33	NPE41	NPE42a	NPE42b	NPE42c	NPE42d	NPE42e	MEM1	MEM2
PHC considered as low performance											
A1	H	139	141	32	116	83	0	21	2	58	317
A2	J	5	9	4	16	6	3	2	3	69	387
A3	A	67	97	9	49	33	11	6	3	4	57
A4	G	171	135	15	63	55	7	13	0	17	95
A5	E	40	113	6	17	12	5	6	0	22	172
Total amount of practices performed	A	422	495	66	261	189	26	48	8	170	1028
PHC considered as high performance											
B1	D	263	245	92	187	142	35	48	8	90	382
B2	C	744	779	68	253	202	95	58	7	63	398
B3	F	838	781	82	320	238	72	79	5	75	487
B4	B	346	320	60	127	104	26	31	5	66	379
B5	I	309	359	64	140	105	42	37	6	102	431
Total amount of practices performed	B	2500	2484	366	1027	771	271	253	21	386	2077

Health Tracers

[a]The health tracer codes correspond to each medical care or practices given to beneficiaries of the plan (NPE32: pediatric consultation in children younger than 1 year; NPE33: pediatric consultation in children aged 1-6 years; NPE41: doses of triple viral vaccine given to children younger than 6 years; NPE42a: doses of Sabin vaccine given; NPE42b: doses of pentavalent vaccine; NPE42c: doses of quadruple vaccine; NPE42d: doses of hepatitis vaccine; NPE42e: doses of triple bacterial cell vaccine; MEM1: first-time prenatal control; MEM2: subsequent prenatal control). Each health institution (PHC center) was classified according to its performance of each tracer. The numbers correspond to the quantity of practices or patients seen by each health institution in the months and year randomly taken as reference for this analysis. Low performance was considered in those cases in which the PHC center offered a number of practices below the point limit for each tracer for the months considered as reference, and high performance when values were over the cutoff point. (For NPE32 cutoff point at ≥200 visits; NPE33 cutoff point at ≥200 visits; NPE41 cutoff point at ≥50 vaccine applications; NPE42a and b cutoff point at ≥100 vaccine applications; NPE42c and d cutoff point at ≥25 vaccine applications; and NPE42e cutoff point at ≥5 vaccine applications.)

could be possible to classify PHC centers with a high or low performance according to expectations of the plan: NPE32 cutoff point at 200 or more visits; NPE32 cutoff point at 200 or more visits; NPE41 cutoff point at 50 or more vaccine applications; NPE42a and b cutoff point at 100 or more vaccine applications; NPE42c and d cutoff point at 25 or more vaccine applications; and NPE42e cutoff point at 5 or more vaccine applications.

Control variables

These variables include human resources and structure facilities in the centers under study and socioeconomic status of beneficiaries of the plan in each PHC center.

Statistical analysis

A univariate analysis was conducted to obtain results from each health center and then a bivariate analysis was performed to obtain correlation (Pearson) between the independent and independent variables. A linear regression analysis was also conducted to assess the predictive character of the independent variable.

RESULTS

Random sampling of 10 PHC centers was done by extracting data from the 45 PHC centers belonging to the local health system. All of them presented the same building characteristics (in square meters and facilities) and similar human resources structure comprising 2 administrative assistants, 2 nurses, 3 doctors (2 general practitioners and 1 pediatrician), 1 dentist, 1 obstetrician, 1 psychologist, and 2 community health workers. All 10 PHC centers had similar amount and characteristics of the target population.

Health practices provided to the target population were irregular among PHC centers, especially regarding pregnancy controls, attention provided to children younger than 1 year, vaccination coverage, and health promotion workshops delivered to the target community (Table 2). Heterogeneity in the achievement of these practices and desired goals was clearly observed (Table 2).

Standard cutoff point established for each health tracer and goal enabled the categorization of PHC centers as either "high-performance" institution or "low-performance" institution in relation to such cutoff points (Table 3). Comparison of both groups (low- and high-performance PHC centers) reveals differences (Table 4) in relation to each practice and tracer.

Table 4. Comparative Analysis of PHC Centers of High and Low Performance According to the Health Care Practices Provided[a]

Type	NPE32	NPE33	NPE41	NPE42 a	b	c	d	e	MEM1	MEM2
A	422	493	66	261	189	26	58	11	170	1028
B	2500	2484	366	1027	771	266	253	21	386	2077
Difference, %	592	504	554	393	408	1023	436	190	227	202
P	<.001	<.001	.01	.03	.02	<.001	.02	.7	.04	.04

Abbreviation: PHC, primary health care.

[a]Each PHC center was classified according to its performance of each tracer (NPE32: pediatric consultation in children younger than 1 year; NPE33: pediatric consultation in children aged 1-6 years; NPE41: doses of triple viral vaccine given to children younger than 6 years; NPE42a: doses of Sabin vaccine given; NPE42b: doses of pentavalent vaccine; NPE42c: doses of quadruple vaccine; NPE42d: doses of hepatitis vaccine; NPE42e: doses of triple bacterial cell vaccine; MEM1: first-time prenatal control; MEM2: subsequent prenatal control). The numbers correspond to the average of each health care tracer provided by type A or B PHC centers in the months and year randomly taken as reference for this analysis. Low performance (grouped in type A institutions) was considered in those cases in which the PHC center offered a number of practices below the point limit for each tracer for the months considered as reference, and high performance (type B institutions) was assigned when values were over the cutoff point. Differences between low- and high-performance institutions are expressed as the percentage and statistically analyzed *P* values.

Regarding fiscal parameters of performance, Table 5 shows the main results for health centers, their total invoiced amount after 5 years of plan implementation, and the amount of money spent in acquisitions. These capabilities of the health institutions were presented next to the results obtained by the manager of each PHC center in each of the dimensions that measure his or her leadership capability (Table 5).

Main differences among PHC centers were then disclosed. While some PHC centers such as F and I showed high efficacy in care, controls, practices, or services given to their target population (and therefore monetarily rewarded for these services), other PHC centers had very low invoicing such as A, E, and J (Table 5). Similar differences regarding purchase of goods were observed, except for the centers with highest profits, which chose to assign high percentages of their funding to other items such as monetary incentives for their staff instead of allocating those funds to the purchase of goods. Note that these PHC capabilities correlate with PHC manager leadership skill (Table 5).

The Pearson correlation coefficient of variables "invoiced amount" and "leadership" was 0.948 ($P < .0001$), whereas the correlation of the variable "amount spent in goods" with the same independent variable "leadership" showed a coefficient of 0.972 ($P < .0001$).

The bivariate correlation analysis was then conducted among each of the dimensions included in the "leadership" variable (general management ability, plan management, commitment, and interest), with both the "amount spent in goods" and "invoiced amount" variables. The result of 8 correlations was positive, higher than 0.910, and all with levels of bilateral significance of less than .0001; therefore, a linear regression analysis was performed. The linear regression analysis revealed that for the "invoiced amount" dependent variable (model 1), the 4 predictive variables (management ability, plan management, commitment, and interest) accounted for 85% of the variance (R^2 corrected = 0.841), with a significant relationship shown by analysis of variance ($P = .008$). Determi-

nation of the standardized regression coefficients, β, revealed that they did not reach an individual significance in the t test, which allowed incorporating each value individually to the model. The same situation was observed when "amount spent in goods" was identified as the dependent variable; the 4 dimensions accounted for nearly 92% of the variance (R^2 corrected = 0.916), with a significant linear relationship shown by analysis of variance ($P = .002$), although β regression coefficient did not reach statistical significance at 5%.

CONCLUSIONS

This study shows that PHC centers with the same staff and building characteristics had significant differences in the efficacy of practices provided to their target population, their goals achievements, and the cost recovery for those controls and practices provided to beneficiaries of the national plan (Plan Nacer) that aims to encourage health teams to work on the basis of results obtained.

A model that focuses on the leadership skill of agent manager of the plan in each PHC center comprising 4 main dimensions was developed. This analysis allows predicting with great precision the results obtained for a health care center according to the leadership characteristics of the PHC center plan's responsible officer.

It should be noted that all medical staff and managers of the plan in PHC centers had regularly attended training management courses conducted by the staff team of Plan Nacer; therefore, all of them had the same access to knowledge and understanding of the plan.

Notably, analysis of all the variables revealed that the higher management capability of the chief agent responsible for the PHC center, regardless the other variables, was the best element to implement the plan with efficacy.

This study could not conclude on the ability of each dimension to predict PHC center performance, possibly due to the sample size. Thus, in future assessments, a large number

Table 5. PHC Center Ability to Generate and Spend Financial Resources Associated With Manager Leadership Capabilities[a]

PHC	Invoiced (in Local Currency Pesos)	Goods Purchased (in Local Currency Pesos)	General Management Ability	Plan Management	Commitment	Interest	Leadership
A	67 190	47 557 (71%)	6.33	6	5	4.33	21.66
B	191 065	94 790 (50%)	9.33	8.9	9	9	36.23
C	199 900	79 321 (40%)	8.9	7.9	8.9	8.99	34.69
D	177 810	71 965 (40%)	9	8.9	8.9	8.66	35.46
E	54 035	28 057 (52%)	5	4.33	3.66	4.66	17.65
F	288 335	98 654 (34%)	9.33	9	9.33	9.33	36.99
G	84 885	37 457 (44%)	6	5.33	6	5	22.33
H	85 600	35 787 (42%)	6.33	5	5	5	21.33
I	229 350	89 098 (39%)	9	9	8.6	9.33	35.93
J	56 290	30 087 (53%)	4	5	4.33	5	18.33

Abbreviation: PHC, primary health care.

[a]Invoiced and goods purchased for PHC centers in the 5-year period of plan implementation are expressed in local currency (pesos). General management ability, plan management, commitment, and interest are features items explored for each manager of the plan in each PHC center that are weighted by a number from 0 to 10 (cutoff point for a good or lousy manager is 6 points). Leadership is a score obtained from previous 4 items mentioned (scores range from 0 to 40, cutoff 24 points; hence, >24 indicates good manager performance).

of PHC centers should be included to identify such situations.

However, within the field of analysis of health care programs, this study is able to show that the manager's leadership skill in PHC centers strongly determines the success or failure of the plan, independently of how good or bad is the drawing up of the program design. This is a topic of special interest to analyze the plan's responsible officer in each PHC, since it has been demonstrated in our results that with same tools (structure, facilities, health team), the same health plan design, and even the same rewards for goals accomplished, results will be different among PHC centers based on the leadership skills (general management capability; plan management, motivation, commitment, and interest) of the local responsible agent of the plan in each PHC center.

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