

Technology Transfer in the Public Health Network of La Guajira, Colombia

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Abstract

The purpose of this research was to analyze the technological transfer in the public health network of Colombia; the research type was defined as descriptive, it was based on a non-experimental design of cross-sectional and field type, the population was constituted by five (5) managers and twenty (20) sub-managers of the public health network hospitals in Colombia. The data collection techniques were the depth interview and the survey. Likewise, an instrument was applied to a pilot group, in order to obtain its reliability; through the use of the Alpha Cronbach coefficient indicating a reliability of 0.91. The results obtained from the survey application were tabulated and analyzed statistically by absolute and relative frequencies. As a result of the research, the mechanisms for the technological transfer in the public health network were identified, in the same way, the technological transfer barriers in the public health network of Colombia were identified.

Keywords: Technological transfer, Health network, Colombia

1. Introduction

In the Colombian sphere, the Health National Social Security Council approves the creation of a council permanent advisory committee through an agreement in which the Health Technological Assessment Commission was constituted. This commission is in charge of evaluating and recommending the different Mandatory

Health Plan (POS) contents in terms of technology, and although efforts have been made to review and make accurate recommendations, this committee currently lacks sufficient resources to achieve better intervention and technology evaluation in Health [1].

In this regard, there are a number of issues that the Colombia Technology Assessment Commission undertakes in the short and medium term, among them are: development of a health technology transfer model applicable to the Health Social Security General System - HSSGS, the introduction of the quality, cost-effectiveness and cost-efficiency concepts in health. And the evaluation of specific technologies evaluation applicable to health that, despite being available in the country, still have no option to be part of the Health Compulsory Plan (HCP) [1].

If reference is made to the problems experienced, in relation to the technology transfer in the public health sector, of La Guajira department, these are due to the fact that the technology market has monopolistic characteristics and the disadvantageous conditions in which the 2nd level public hospitals (San José Hospital from Maicao, Nuestra Señora de los Remedios Hospital from Riohacha and San Rafael Hospital from San Juan) are in front of the providers, and the lack of an adequate policy in science and technology oriented to control the technology flow and obtain the maximum transfer benefits.

Thus, considering that the foreign technologies acquisition through technology transfer is fundamental for the economic and social development of the Colombian health network, it is important to mention that this process cannot be only one-way (that is, in technology transfer, there must be feedback between technology providers and those who acquire it).

In this sense, problems have arisen related to the cost and technology use, generated by the technological capabilities lack in health sector institutions of La Guajira, Colombia, with deficiencies caused by the scientific and technological infrastructure weakness, and caused by the autonomy lack for decision making in technological matters, among others.

Starting from the previous assumptions, another problem identified is derived from the technology nature, associated with inadequate technologies, there are technologies that are not compatible with the health sector because they do not conform to the market nature, or because they do not respond to the production factors relative costs, or because they are not linked to the technological system in use, generating inefficiencies and distortions in the health system, which ultimately result in social imbalances in the receiving institutions [2].

Another aspect that is evident is the health sector capacity lack with respect to the scientific - technological structure, as a great influence factor in the technology transfer process, as well as the high dependence on external technologies due to the

local development inability which has undesirable consequences that are reinforced to affect the health sector development, diminishing its capacity for self-determination [1].

On the other hand, it is convenient to refer to the cost of using a technology, which is not only sometimes high but also assumes indirect costs form tied to hiring; because of monopolistic practices in the technology market, suppliers impose arbitrary and pernicious commercial conditions; for example, the obligation to buy exclusively inputs, raw materials and equipment; the production volumes limitation, and pricing of products made with their technology [2].

With regard to the problems related to the technology use, the restrictions imposed on hiring appear. Most of these restrictions are obligations that the concessionaire acquires, which also translate into costs, such as: obligation to use grantor technical personnel, obligation to pay royalties on the technology part that does not even use, products exports restriction, and even more absurd, obligation to cede rights on improvements or incremental innovations that are made in the technology during its use [3].

From this perspective, both organizational and technological barriers are evident in the transfer process, due to the high dependence on external technologies because of local development inability. This excessive dependence on foreign technologies makes the 2nd level public hospitals net importers technologies, diminishing their capacity for self-determination and development. Regarding technological barriers, they are related to inadequate technologies that do not fit with the technological system in use by hospitals, generating inefficiencies and distortions.

2. Methodology

The methodology demonstrates that the research type is descriptive [4], with a non-experimental [5], transsectional and field design [6]. The population is classified as finite [7] and is made up of all the 2nd level hospital institutions that make up the public health network of La Guajira - Colombia, as can be seen in (Table 1).

Table 1. Population under study: Public health network hospitals in La Guajira Colombia

Institution Name	Address
San José Hospital from Maicao (La Guajira – Colombia)	Street 40 road to Riohacha
Nuestra señora de los Remedios Hospital from Riohacha (La Guajira – Colombia)	Street 12 #15-00
San Rafael Hospital from San Juan (La Guajira – Colombia)	Street 3 south #4-20

Regarding the informants, it will be made up by the department or area managers and sub managers of the 2nd level hospital institutions that make up La Guajira-Colombia public health network, linked to the technology transfer process (Table 2).

Table 2. Population distribution: Public health network hospitals Managers and sub-managers

Hospital	Manager	Area Sub manager
San José Hospital from Maicao	One (1)	0
Nuestra señora de los Remedios Hospital from Riohacha	One (1)	One (1) administrative sub manager One (1) financial sub manager One (1) scientific sub manager One (1) human talent sub manager
San Rafael Hospital from San Juan	One (1)	One (1) administrative sub manager One (1) financial sub manager One (1) scientific sub manager One (1) human talent sub manager
Total	Twenty five (25)	

The survey was used as a data collection technique [4] and the instrument was a Likert scale questionnaire [7]. Once the data collection phase was completed, the items were codified and tabulated by recording the data contained in each of the questionnaires considered valid; all this was done using statistical analysis through absolute and relative frequency distributions [8].

3. Results and Discussion

To analyze the technological transfer in the Colombia public health network, three dimensions were used: mechanisms and strategies.

Table 3. Results, Dimensión, Mechanisms.

Ind.	Ítems	Response alternativas										Total	
		5		4		3		2		1			
		Af	Rf	Af	Rf	Af	Rf	Af	Rf	As	Rf	Af	Rf
Know-How contract	The know-how, is constituted in a technological transfer mechanism in the Colombia public health network.	12	80%	3	20%	0	0%	0	0%	0	0%	15	100%
	The know-how, is constituted in a mechanism for the Knowledge use whose property is not legally protected.	14	92%	0	0%	1	8%	0	0%	0	0%		
	SUBTOTAL	13	86%	3	10%	1	4%						
Reverse Engineering	Reverse engineering, as a technology transfer mechanism, allows to identify the knowledge that supports the organizational methods required in the Colombia public health network.	6	40%	0	0%	11	60%	0	0%	0	0%	15	100%

Table 3. (Continued): Results, Dimensión, Mechanisms.

	Reverse engineering requires the scientific knowledge domain necessary in the processes carried out by the companies that make up the Colombia public health network.	0	0%	7	48%	8	52%	0	0%	0	0%		
	SUBTOTAL	3	20%	4	24%	10	56%	0	0%	0	0%		
Joint-Ventures	Joint ventures have not only lent themselves to disadvantageous negotiation practices for concessionary countries, but could also be configured as an obstacle to the technological development of Colombia public health network	0	0%	7	47%	8	53%	0	0%	0	0%	15	100%
	The joint-ventures is a technology transfer mechanism that has a constitutional flexibility that allows the companies that make up the Colombia public health network to operate in foreign markets.	4	27%	7	47%	4	27%	0	0%	0	0%		
	SUBTOTAL	2	13%	7	47%	6	40%	0	0%	0	0%		
TOTALS		3	17%	5	35%	7	48%	0	0%	0	0%	15	100%

According to the results of Table 3, in which the technology transfer mechanisms of the Colombia public health network were established, the surveyed population totally agrees, with what the know-how as a technological transfer mechanism, consists in a secret about a set of industrial knowledge, commercial or for the service provision, which provide a competitive advantage to La Guajira Colombia public health network [9].

Likewise, reverse engineering, as a technological transfer mechanism, allows identifying the knowledge that sustains the products, and production processes, the materials used and the organizational methods required in the companies that make up the public health network of La Guajira Colombia [2]. On the other hand, joint ventures are a technology transfer mechanism, which has not only been used for negotiation practices that are disadvantageous for the concessionary countries, but could also be configured as an obstacle to the companies technological development that make up the public health network in La Guajira Colombia, judgments backed by the majority of the surveyed population [3].

With these favorable results, it could be said that in order to achieve technological transfer, dynamic innovation mechanisms or tools are required, considered in two senses, both in the transfer by those who generate technology and do not exploit it commercially, as well as in On the other hand, the technology incorporation for its commercialization by those who do not have it. A large part of the technology incorporation rests in the La Guajira Colombia public health network entities and the increasing involvement of technological organizations in facilitating it.

Table 4. Results, Dimension Barriers

Ind.	Ítems	Response alternatives										Total	
		5		4		3		2		1			
		TA		MA		ND		MD		TD		Af	Rf
		Af	Rf	Af	Rf	Af	Rf	Af	Rf	Af	Rf		
Technological	Technological barriers are related to technologies that do not respond to the production factors costs of the Colombia public health network.	12	80%	3	20%	0	0%	0	0%	0	0%	15	100%
	The capital-intensive technologies transfer for the companies that make up Colombia public health network requires less work force.	8	32%	7	47%	0	0%	0	0%	0	0%		
	SUBTOTAL	10	56%	5	33%	0	0%	0	0%	0	0%		
Organizational	The technology transfer process in the companies that make up the public health network in Colombia has not been adequately planned.	7	47%	0	0%	8	53%	0	0%	0	0%	15	100%
	Companies in the public health network that import technology net due to the limited technological research that is carried out.	8	53%	0	0%	7	47%	0	0%	0	0%		
	SUBTOTAL	7,5	50%	0	0%	7,5	50%	0	0%	0	0%		
Personal	Personal barriers to technology transfer appear as restrictions imposed on the companies that make up Colombia public health network.	12	80%	3	20%	0	0%	0	0%	0	0%	15	100%
	The technology transfer personal barriers are a rejection of the new technology adoption process by the personnel that make up the Colombia public health network	0	0%	7	47%	8	53%	0	0%	0	0%		
	SUBTOTAL	6	40%	5	33%	4	27%	0	0%	0	0%		
TOTALS		8	49%	3	22%	4	26%	0	0%	0	0%	15	100%

When studying the dimension with which the technological transfer barriers of La Guajira Colombia public health network are analyzed (Table 4), it can be noted that the surveyed population showed total agreement with what Cruz proposes [9], regarding that technological barriers are related to the technologies transfer that are not compatible with the economic system because they do not respond to the production factors costs or because they generate inefficiencies that ultimately translate into imbalances for the companies that make up La Guajira public health network.

In the same way this author comments that these companies are technology net importers due to the scarce technological research that is carried out and the human resources lack trained to make evaluation, selection and adaptation of technologies and also the population also supports the same autor approach , regarding the fact that technological transfer personal barriers appear as restrictions imposed on hiring; such as the obligations to pay royalties on the technology part and products exports restriction purchased by La Guajira Colombia public health network.

In this sense, the barriers are obstacles found in the network to adopt a technology point towards the planning lack and control in the technology transfer, the high dependence on external technologies and the restrictions imposed on the hiring by the provider of the same.

4. Conclusions

It is concluded that the most used mechanism is the know-how contract, which designates the knowledge or methods series with applications within the network entities, complying with a legal nature rules by which the technology provider commits to make available to the hospitals the technical know-how constituting the know-how in a definitive way, detaching from them in whole or in part, or is obliged to communicate such knowledge, enabling its exploitation for a specific time, in exchange for a consideration.

In relation to the technological transfer barriers in La Guajira Colombia public health network, technological barriers were identified, derived from the technology nature and related to inadequate technologies; the technologies transfer that are compatible with the hospitals current system that make up the network, and because they are not linked to the technological system in use, generating inefficiencies.

In the same way, it can be concluded that there are organizational barriers related to the planning and technology transfer control, due to technological capacity lack in the productive sector and the scientific-technological infrastructure weakness, which becomes a great influence factor on the process within the second level hospitals that make up La Guajira Colombia public health network.

On the other hand there is a new technology rejection or the adoption process interpreted as an aggression to the activity that is being carried out. The barriers associated with the technology use appear as restrictions imposed on hiring; most of these restrictions are obligations that the hospital entity acquires, which also translate into costs, such as: obligation to use grantor technical personnel, obligation to pay royalties on the technology part that does not even use, products export restriction and even more absurd, obligation to cede rights over better or incremental innovations that are made in the technology during its use.

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