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SOCIO - TECHNICAL DESIGN OF THIRD LEVEL SERVICES OF PUBLIC HEALTH CARE IN THE CUSCO REGION, PERU

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Abstract. Objective. Determine the proposal to redesign the public health care system of the third level of the Cusco region so that it serves to improve the resolution capacity of hospitals in the treatment of chronic degenerative diseases. Methodology: A qualitative and quantitative approach is used by analyzing the data obtained in the documentary review. Thus, field work is as important as hosting procedural guides. Result: It was found that the redesign of the public health care system of the third level of the Cusco region needs changes that allow the improvement of management; Likewise, it implies the construction of the III-E Specialty Hospital, the Antonio Lorena Hospital remains in category III-1 and the current Regional Hospital becomes the Regional Emergency Hospital in the context of the regional health organizational model based on socio-economic criteria. - technicians. Discussion: References to national hospitals and institutes in the capital are notably reduced, so that the regional public health system becomes a containment ring for the diagnosis and treatment of prevalent non-communicable diseases, thus strengthening the national network. Finally, as a consequence of the study, a theoretical framework is available from which the determinants of health are better explained.

Keywords: Society typology, health transition, epidemiological transition, demographic transition, organizational model, epidemiological profile.

IMPLEMENTACIÓN TÉCNICO – SOCIAL DE SERVICIOS DE SALUD DE TERCER NIVEL DE ATENCIÓN DE LA REGIÓN CUSCO, PERÚ

Resumen. Objetivo. Determinar la propuesta de rediseño del sistema público de atención de salud del tercer nivel de la región Cusco para que sirva para la mejora de la capacidad resolutoria de los hospitales en el tratamiento de enfermedades crónico degenerativa. Metodología: Se utiliza un enfoque cualitativo y cuantitativo mediante el análisis de los datos obtenidos en la revisión documental. Es así que tan importante es el trabajo de campo como acoger guías procedimentales. Resultado: Se encontró que el rediseño del sistema público de atención de salud del tercer nivel de la región Cusco necesita cambios que permitan la mejora de la gestión; asimismo, implica la construcción del Hospital de Especialidades III-E, el Hospital Antonio Lorena permanece con la categoría III-1 y el actual Hospital Regional se convierte en el Hospital Regional de Emergencias en el contexto del modelo organizacional de salud regional basado en criterios socio – técnicos. Discusión: Se reducen notablemente las referencias a hospitales nacionales e Institutos de la capital, de manera que el sistema regional público de salud se convierte en un anillo de contención del diagnóstico y tratamiento de enfermedades prevalentes no transmisibles, fortaleciendo de esta manera la red nacional. Finalmente, como consecuencia del estudio se dispone de un marco teórico a partir del cual se explican de mejor manera los determinantes de salud.

Palabras clave: Tipología societal, transición en sanitaria, transición epidemiológica, transición demográfica, modelo organizacional, perfil epidemiológico.

Introduction

Various aspects currently explain the unusual development of humanity, including advances in digital technology and media that together have generated an accelerated process, in general terms, of reordering the world economy and a cultural alignment around globalization. This accelerated process has become a pattern for many countries to achieve a place in the "global village" through complex mechanisms of assimilation and accommodation.

Another concept that comes from this first reflection is the capacity of States to modulate this transition from both perspectives through the complex mechanisms mentioned and their speed. The modulation of the transition has to do fundamentally with levels of competitiveness and productivity of the population, whose pillars, it goes without saying, are education and health. States that today enjoy economic stability and health welfare are precisely because they have been able to manage the transition with respect to the demands of the new economic, social and political order; while those States in which traditional social, economic and political conflicts prevail, the modulation of the transition shows difficulties in its management.

Several studies have recognized the need to ensure the effectiveness and safety of drug treatments (Alvarez-Risco, Villasante-Herrera and Del Aguila-Arcentales, 2013; Alvarez-Risco, Roman-Calsine and Del Aguila-Arcentales, 2013; Alvare et al, 2013; Enciso et al., 2016; Alvarez-Risco, Quiroz-Delgado and Del-Aguila-Arcentales, 2016; Mejía-Acosta et al., 2016; Silva-Villanueva et al., 2017; Del-Aguila-Arcentales et al., 2018; Alvarez-Risco, Del-Aguila-Arcentales and Diaz-Risco (2018), Alvarez-Risco and Del-Aguila-Arcentales, 2019; Zhang et al.)

In order to focus on the regional health issue and the need for its redesign, it is advisable to centralize the text on the transition and its relationship to health, without this implying that issues are to be avoided, but rather, that they are to be significantly contextualized. Therefore, the concept of health transition implies understanding it within three perspectives that imply transformations: the first one, the trajectory followed by diseases according to the societal dystopias resulting from the determinants; the second one, the prevalence of diseases in certain population niches in certain periods; and the third one, the organized health response capacity on the part of the State to address the trajectories followed by diseases.

Likewise, the capacity of modulation by the State is not limited only to the management of exogenous factors but above all to the preservation of the quality of life as a precondition of habitability, that is, the quality of life derived from the psychological factors that are predecessors of the condition of living, so that a habitable place becomes the physical, psychological and social structure where the population extends its human potential.

However, the evidence on the degradation of the quality of life and habitability in some parts of the world is compelling; The study recognizes that the entropic nature of the universe places humanity in the imprint of chaos and order and knowledge as the mechanism to overcome such imprint, so that education and the level reached by a society is in direct proportion to the quality and habitability of the place it occupies, therefore, the cycles of chaos and order of entropy alternate as the development of humanity and knowledge becomes the mediator of the alternation in order not to put both conditions at risk. A clear example of this is the reaction of the South Korean health system, whose control based on the education of its population has made it possible to reduce the spread of the COVID-19 virus and counteract its effects, unlike other nations. Another component of the theoretical vision of the study consists of challenging the orthodox approaches to health from the general theory of systems including the sociological perspective in order to achieve a totalizing approach. In this sense, the aim is to highlight the causes that are accelerating or not the epidemiological transition and the effects that they cause on the population and its health systems.

Therefore, today, certain economic, social and biological determinants are generating a domino effect on the epidemiological transition, that is, the causes of morbidity and mortality are no longer transmissible diseases such as infections, but those that are not transmissible such as degenerative diseases; re-emerging diseases such as the most aggressive viral processes; and mental diseases such as stress and depression resulting from work pressure and consumption, which require greater complexity and greater resolution capacity in both diagnosis and treatment in hospitals. Regarding the condition on the demographic transition, it is known that degenerative diseases show their prevalence in the elderly population, the re-emergent and mental diseases affect the population in a transversal way.

The public system of national and regional health services has difficulties in facing this new epidemiological profile and challenges its weak capacity to resolve and puts in crisis its system of reference and counter-reference, and above all generates in the population a perception of mistrust of the quality of care and service. In the scenario of emerging epidemiological profiles, it is essential to review the literature on health paradigms and their validity, health care models to see their correspondence, health systems to evaluate their effectiveness, and organizational models on which all systems are based. With these inputs, we propose the redesign of the public health care system of the third level of the Cusco region, to improve the resolution capacity of hospitals in the treatment of chronic degenerative diseases.

For situations of health and disease and their context of occurrence, we begin with the studies on epidemiological transition by Omran et al. (2005) to build a vision of the evolution of diseases on theories that are questionable, but valuable in some topics. In the same way, studies on organizational models, a fundamental part of health systems, are referred to; in this sense, a conceptual demarcation is made with the support of studies from the Tavistock Institute and others; however, special mention should be made of the attempts recognized by supranational organizations such as the World and Pan American Health Organization in matters of health care reform in hospitals in countries such as Brazil, Chile and Argentina with the support of the Technical Cooperation of some countries of the European Community in the framework of the improvement of the operation, management, efficiency and quality of health care provided by hospitals. In this sense, any work that is limited to the above-mentioned objective could not do without the literature generated as a result of this long academic and political debate; in fact, this literature should be included, as far as feasible, in two national sectoral documents on third level health care management in governments.

However, the bibliographic follow-up carried out on the subject in Peru allows us to conclude that there are no important concepts on the improvement of health care in third-level hospitals. This omission is largely due to two factors: first, the seriousness of the situation of the national public health system and the regional debt, and second, the governance crisis that the country has been going through over the last two decades. However, the exquisite debate on the subject within the universities has been verified, but it does not manage to transcend the public sphere. Meanwhile, the negative perception of the public health system by the population continues to grow. In Peru, it is common to see political statements from the government such as the universalization of health care as a fundamental right of the person, but without the company of financing; that the only thing that will be achieved is to aggravate the situation of hospital health care in its three major components: human resources, biomedical equipment and infrastructure. In order to have an adequate perspective on previous research carried out on the improvement of health care management in third level hospitals, access has been gained to the document prepared by bipartite assignment between the Pan American Health Organization and the Technical Cooperation of the French government through the Association for Cooperation in the Development of Health Services, in which health professionals with expertise in development, management and evaluation of health services, human resource management, information systems management and hospital management worked. This team of researchers carried out a study over two years on the transformation of hospital management in Latin America and the Caribbean at the beginning of the century, a crucial moment for global society; whose conclusions should be highlighted because some of them served as a motivation for this study, ergo, continuity to the concepts raised in it; and that at this time it is worth mentioning them.

Method

The methodological approach considers preliminary aspects such as the positioning of the researcher with respect to the reality to be investigated, its qualitative and quantitative approach and its use in the development of the article. The purpose of this approach is for the researcher to assume the methodological development of the article in a dynamic and flexible way, given the relational approach it requires, and attempts to clarify the variety of tools available. Thus, field work is as important as hosting procedural guides. The proposed methodological design is conditioned by factors associated with empirical references and

conceptualizations of the research questions. With respect to the empirical references, it is analyzed to link it to the part of reality that has been observed.

The choice of approach is not only based on the positioning of the researcher, but on the inherent nature of each object and its relationship to the researcher's objectives and interests. So these two options are not exclusive when designing the research methodology. Thus, triangulation as an approach is presented as an option to this polarization, that is, the researcher will be able to collect data with tools from both approaches. Thus, triangulation as an optional approach has the characteristic of being complementary; where qualitative and quantitative approaches feed into each other to produce knowledge that both in isolation could not. The health issue is complex; hence data collection, analysis and interpretation techniques and tools will need to be diverse. The intervention scenarios are not preconceived, but are constructed by the researcher who is the source of the information that he or she will transform into data and allow conclusions to be drawn regarding the research questions. The analysis and interpretation of data is essential; only through this instance can categories, variables and indicators be identified that will allow the objectives of the article to be met. Within the qualitative approach, data collection methods can be available as context and depth to determine the background of people's thoughts and experiences; exploration and discovery, as well as interpretation for an understanding of why things are the way they are.

Results

Epidemiological transition

Health determinants in the Cusco region versus epidemiological profile

Habits and lifestyles are conducive to the transition of noncommunicable diseases; regarding chronic diseases, Table 1 shows that the region is in the national average of chronic diseases with 11.0% and 8.6%.

Table 1

Peru: Standardized mortality rates by cause group per 10,000 population – 2016

Region	Communicable diseases	Tumors	Diseases of the circulatory system	External causes
AMAZONAS	13.8	11.3	23.2	14.3
ÁNCASH	15.0	10.1	11.2	8.9
APURÍMAC	18.9	9.6	10.1	15.3
AREQUIPA	11.8	11.0	7.8	6.7
AYACUCHO	18.4	12.2	8.7	13.4
CAJAMARCA	14.4	12.4	14.9	9.6
CALLAO	12.6	11.0	9.1	2.0
CUSCO	15.6	11.0	8.6	17.7
HUANCAVELICA	16.2	14.3	9.4	14.4
HUÁNUCO	13.8	16.4	10.0	12.2

ICA	14.0	9.2	9.6	4.1
JUNÍN	16.1	13.5	7.9	11.0
LA LIBERTAD	10.9	11.3	12.3	5.2
LAMABAYEQUE	9.8	12.2	9.4	5.0
LIMA	13.0	12.0	8.3	2.6
LORETO	25.2	12.0	9.8	4.7
MADRE DE DIOS	25.5	10.2	7.0	14.2
MOQUEGUA	10.3	12.3	6.5	8.7
PASCO	16.8	14.0	11.2	14.3
PIURA	13.3	11.2	13.9	4.3
PUNO	16.4	7.3	8.6	13.0
SAN MARTIN	17.5	11.7	12.5	11.1
TACNA	13.9	10.9	7.7	7.9
TUMBES	18.5	10.5	17.7	5.0
UCAYALI	22.0	11.8	14.1	7.2
NATIONAL AVERAGE	15.7	11.6	10.8	9.3

Note: Source: Ministry of Health (2018)

Epidemiological transition and mortality by cause groups

Table 2 shows that in third and fourth place are the diseases of the circulatory system and neoplastic with 14.63% and 13.64% respectively.

Table 2

Cusco: Mortality by major cause groups 2007 – 2016

Nº	LARGE GROUPS OF CAUSES, LIST 10/100		%
1	INJURIES AND EXTERNAL CAUSES	19 186	25.85
2	INFECTIOUS AND PARASITIC DISEASES	12 267	16.53
3	DISEASES OF THE CIRCULATORY SYSTEM	10 860	14.63
4	NEOPLASTIC DISEASES	10 122	13.64
5	DISEASES OF THE DIGESTIVE SYSTEM	7 465	10.06
6	METABOLIC AND NUTRITIONAL DISEASES	3 383	4.56
7	OTHER DISEASES	3 058	4.12
8	DISEASES OF THE RESPIRATORY SYSTEM	2 745	3.7
9	PERINATAL CONDITIONS	2 705	3.64
10	MENTAL ILLNESS AND CNS	2 421	3.26

Note: Source: Ministry of Health (2018)

Epidemiological transition, hospital discharges and reason for consultation

With respect to the epidemiological transition towards chronic-degenerative diseases, the ministry's national discharge report, table 3, shows that the diseases have been showing a prevalence of 21.0%, which includes genital-urinary, cardiovascular, neoplastic, skin and neuropsychiatric diseases.

Table 3

Cusco: Diagnosis of hospital discharges in Diresa's IPRESS 2007 – 2015

Nº	LARGEST GROUP, LISTS 12/110	%	AMOUNT
1	COMPLICATIONS OF PREGNANCY, CHILDBIRTH AND PUERPERIUM	23.63	54 961
2	OTHER DISEASES	15.24	35 442
3	DIGESTIVE DISEASES	13.21	30 734
4	TRAUMA AND POISONING	13.00	30 243
5	INFECTIOUS AND PARASITIC DISEASES	12.65	29 418
6	GENITOURINARY DISEASES	7.25	16 860
7	CARDIOVASCULAR AND RESPIRATORY DISEASES	5.27	12 263
8	NEOPLASTIC DISEASES	3.78	8 784
9	DISEASES OF THE SKIN AND THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE	2.88	6 691
10	NEUROPSYCHIATRIC AND SENSE ORGAN DISEASES	1.85	4 296
11	ENDOCRINE, METABOLIC AND NUTRITIONAL DISEASES	1.17	2 717
12	DENTAL DISEASES AND THEIR SUPPORTING STRUCTURES	0.07	170

Note: Source: Ministry of Health (2018)

Healthcare transition*Access to health services. Search for healthcare*

The requirement for health benefits is linked to an orderly determination of persons. In the first instance, it is determined whether the person who is exposed to a symptom of the illness, experiences an accident or demands a preventive benefit is seeking or receiving the benefits. In the second instance, it is determined to choose a type of benefit provider. These stages are associated with the request for benefits, which determines the number of people seeking benefits or the possibility of accessing a benefit. This perspective of health care services allows finding out who requires the service and who faces accessibility barriers to the service; a situation that will facilitate the design of the focus of the services. Thus, accessibility to health facilities will be highlighted only if the person decides to report sick and be treated in one or another facility. The decision to receive care is conditioned by the fact that the person is on leave of absence as a consumer or by the difference in profits.

On the other hand, it is a priority to take into account the determinants that act in the decision to opt for care in a particular facility, limited to the access to health services and the probability of choosing a particular facility to which one has access. Table 4 shows that in Peru 56.9 percent of the population reported having some form of illness. This percentage is higher when the problem is not chronic (63.8 percent) in relation to chronic diseases (49.3 percent).

Table 4

Peru: Population seeking health care by type of illness. 2015

TYPE OF DISEASE REPORTED		SEEKS CARE		TOTAL
		YES	NO	
CHRONIC ILLNESS	N°	4 914 499	6 060 222	9 964 721
	%	49.3	50.7	100.0
NON-CHRONIC DISEASE	N°	3 920 972	3 930 964	10 851 936
	%	63.8	36.2	100.0
TOTAL	N°	11 835 471	8 981 186	20 816 657
	%	56.9	43.1	100.00

Note: Source: National Institute of Statistics on Informatics (2016)

On the other hand, the evaluation of the relationship between the possession or not of health insurance versus health care provision (Table 5) shows that the situation of the insured person supports the health care provision, and in general the people with health insurance consult their health in a higher percentage than those without insurance in a relation of 58.8% against 53.3%, the provision of health care with EsSalud insurance and others in a relation of 65.4% and 66.2%.

Table 5

Peru: Population seeking health care by health insurance tenure – 2015

INSURANCE AFFILIATION		SEEKS CARE		TOTAL
		YES	NO	
AFFILIATED TO A HEALTH INSURANCE	N°	7 988 533	5 605 708	13 594 241
	%	58.8	41.2	100.0
SIS	N°	3 884 528	3 446 885	7 331 413
	%	53	34.6	100.0
HEALTH	N°	3 310 806	1 750 509	5 061 315
	%	65.4	34.9	100.0

OTHER INSURANCE	N°	775 102	395 917	1 172 019
	%	66.2	33.8	100.0
NO INSURANCE	N°	3 846 938	3 375 479	7 222 417
	%	53.3	46.7	100.0
TOTAL	N°	11 835 471	8 981 187	20 816 658
	%	56.9	43.1	100.0

Note: Source: National Institute of Statistics on Informatics. (2016)

Reasons for not consulting

Table 6

Peru: Reasons for not consulting a health care facility – 2011

YEAR	REASONS FOR NOT CONSULTING					
	LACK OF MONEY	MISTREATMENT OF STAFF / LACK OF TRUST / DELAY	HOME REMEDIES OR SELF-PRESCRIPTIO	LACK OF TIME	WAS NOT NECESSARY	OTHER 1/
2004	23.7	8.3	42.5	9.0	34.3	8.0
2005	24.4	7.9	38.7	9.7	35.1	7.5
2006	21.8	7.9	27.4	10.1	35.0	6.6
2007	22.1	8.6	34.4	12.1	35.1	7.6
2008	18.6	10.3	33.4	14.1	36.2	8.6
2009	15.2	12.0	30.0	17.5	39.2	9.8
2010	13.6	13.1	29.8	19.1	38.5	12.2
2011	12.9	13.6	28.8	18.1	40.5	11.9

Note: Source: Ministry of Health (2018)

The propensity of the causes for which the population that reported illness did not seek care in the period analyzed in table 6 shows a sustained increase in the cause "not necessary" and "lack of time"; the former rose from 9.0% to 18.1%, and the latter from 34.3% to 40.5%. Similarly, the causes linked to the quality of service dimension increased from 8.3% to 13.6%. However, the cause of lack of money has experienced a significant decrease from 23.7% to 12.9%. The same phenomenon occurs with the justification for the use of home remedies, which fell from 42.5% to 28.8%.

Reasons for not consulting according to poverty classified by per capita expenditure

However, the main reason for not consulting is "not necessary" in 40.5% of cases, which was reported in a lower percentage in the extreme poor (32.6%) and in the population of quintile I (31.3%). Lack of money is reported as a cause of nonconsultation mainly among the extremely poor in 21.0% and in the population of quintile V in 9.4%. The use of home remedies is reported as a cause for not consulting in the population of quintile V at 4.8 percent. On the other hand, "self-medication" is the cause that reported the highest percentage in Quintile V, 23.5% versus 13.9%. Inaccessibility to the health center as a cause

of not consulting is higher in quintile I with 10.1 percent and in the extremely poor with 13.8 percent than in quintile V with 0.8 percent and non-poor with 2.4 percent (see Table 7).

Table 7

Peru: Reasons for not consulting a health facility according to poverty classified by per capita expenditure – 2011

POVERTY		REASONS FOR NOT CONSULTING				
		LACK OF MONEY	MISTREATMENT OF STAFF / LACK OF TRUST / DELAY	HOME REMEDIES OR SELF-PRESCRIPTION	LACK OF TIME	WAS NOT NECESSARY
POOR EXTREME	N°	158 015	93 653	266 856	81 215	244 910
	%	21.0	12.4	35.5	10.8	32.6
POOR NON-EXTREME	N°	532 198	407 406	816 816	450 882	918 002
	%	19.8	15.1	30.3	16.7	34.1
NOT POOR	N°	901 968	1 178 814	2 459 520	1 697 973	3 826 234
	%	10.2	13.3	27.7	19.1	43.1
QUINTIL I (POOREST)	N°	492 815	399 771	902 235	364 579	808 585
	%	19.1	15.5	35	14.1	31.3
QUINTIL II	N°	468 845	410 086	754 461	481 314	912 313
	%	18.2	15.9	29.3	18.7	35.4
QUINTIL III	N°	337 009	369 899	658 258	511 383	1 070 086
	%	13.0	14.3	25.5	19.8	41.4
QUINTIL IV	N°	218 945	297 027	613 336	508 319	1 069 844
	%	9.1	12.3	25.4	21.1	44.4
QUINTIL V (LESS POOR)	N°	74 567	203 188	614 902	364 476	1 128 318
	%	3.4	9.4	28.3	16.8	51.9
TOTAL	N°	1 592 181	1 679 973	3 543 192	2 230 071	4 989 146
	%	12.9	13.6	28.8	18.1	40.5

Note: Source: Ministry of Health (2018)

Inequality analysis

The Lorenz curve and the Gini index make it possible to determine the existence or not of inequality in the distribution of the population that reports illness, globally and according to type. In the same way, it shows the inequality in access to institutional care. To achieve this purpose, we work with the Gini index, the concentration index and the multiple linear regression. The Gini index is used to assess the distribution of income among the population. This index is based on the Lorenz curve and the accumulated frequency curve, which contrasts the empirical distribution of a variable with its uniform distribution of

equality represented by a diagonal line. The greater the area between the Lorenz curve and the diagonal, the greater the inequality.

In fact, the curve can be below or above the diagonal, depending on the variable used. Precisely, one of the ways to measure the degree of inequality in the Gini index is to summarize the deviation of the Lorenz curve from the equality diagonal. This index is twice the area between the Lorenz curve and the diagonal and takes values between zero which corresponds to perfect equality and one which is total inequality. The study analyzes how the distribution of health problems is concentrated according to their nature and how access to health care is distributed. For 2011, Peru's Gini index for those who suffer from a disease is 0.305.

When prospecting according to the type of health problem, a greater inequality in the distribution of people who suffer from an acute illness according to Gini corresponds to 0.89 than if they had a chronic health problem 0.638. In relation to the distribution of access to health care in institutional centers, there is an index of 0.86 that shows a pattern of inequality. Table 69 of the evolution of the Gini index assesses the propensity to inequality measured with this index in the period 2004 - 2011. A decrease in the inequality of the distribution of the declaration of some disease symptom is observed. Thus, for the year 2004 the inequality is 0.64 and for the year 2011 it decreases to 0.305. This behavior is similarly observed in the inequality of the distribution of people suffering from a chronic disease from 0.823 in 2004 to 0.633 in 2011.

In relation to people who have reported an acute illness, the inequality measured with Gini has remained above 0.8 during the period 2004 - 2011. Inequality in the distribution of access to health care in health centers has also remained above 0.8 since 2004. Therefore, this first approximation shows that health problems are unequally distributed, emphatically those of an acute nature and in the access to institutional health care. Therefore, it is necessary to demonstrate whether the inequality is produced by economic factors and for that purpose the concentration index.

Evolution of expenditure in the health sector

In relation to the evolution of health spending as a percentage of the Gross Domestic Product in the period 2000 - 2014, it is concluded that there is a favorable trend in the sector, which went from 2.68% in 2000 to 3.32% in 2014. However, the budget allocated is still insufficient if we take into consideration those allocated in countries of the region such as Colombia and Chile and others of the Organization for Cooperation and Development. According to table 8, the evolution shows that by 2014 it will account for 3.32% of the Gross Domestic Product and the average for the region is 7.2% and the average for the countries of the Organization was 12.4%.

In the context of the health transition, what was analyzed in the previous paragraph leads to think about the insufficiency of the budget to finance the public health care model already questioned, so that its objective is basically to finance the Essential Plan for Universal Insurance (PEAS) and not to improve the sector as a whole, with the deficiencies that this implies with respect to the effectiveness of the expenditure, because according to the Demographic and Family Health Survey (ENDES) the population with coverage is smaller than the population informed by the program; Another situation is due to the fragmentation of the health service; and to this is added the uncertainty generated by strategic programs at the time of planning. With respect to the present study, it is necessary to specify the emphasis that the State places on the quantitative situation in detriment of the quality of attention.

Table 8

Peru: Evolution of health spending as a percentage of GDP

YEAR	PERCENTAGE		
	PRIVATE EXPENDITURE	PUBLIC EXPENSE	TOTAL EXPENSE
2000	2.08	2.68	4.76
2002	2.10	2.81	4.91
2003	1.92	2.70	4.62
2004	2.02	2.54	4.56
2005	1.99	2.65	4.65
2006	2.01	2.37	4.36
2007	2.16	2.41	4.58
2008	2.30	2.50	4.77
2009	2.39	3.00	5.39
2010	2.26	2.80	5.08
2011	2.29	2.60	4.91
2012	2.33	2.85	5.17
2013	2.19	3.05	5.23
2014	2.15	3.32	5.47

Note: Source: Ministry of Health (2018)

In relation to the density of human resources per inhabitant, table 9 shows that the ratio of health care personnel, that is, doctors, nurses and obstetricians, per every ten thousand inhabitants has been growing progressively and proportionally in the period 2012 - 2018 with a slight increase in the growth of nursing personnel, in the perspective of going beyond the World Health Organization's fence. According to the World Bank, only five out of forty-nine countries classified as low-income manage to surpass the threshold of 23 doctors, nurses and midwives per ten thousand inhabitants, a figure that the World Health Organization has set as the minimum necessary to provide essential maternal and child health services. So those countries that do not surpass this fence have difficulty providing basic health services.

With respect to the expenditure on health per capita in 2016, the World Bank published a summary of expenditure by country. The data shows that the United States is the country that invests the most in health per capita in 9,869.74 dollars and at the opposite end is the Central African Republic with 16.36 dollars. In the European region, spending fluctuates between US\$ 9,835.96 and US\$ 2,389.89; while in the Latin American region it fluctuates between US\$ 1,379.10 (Uruguay) and Nicaragua with US\$ 188.16, Peru invests US\$ 316.44 in health per capita, long surpassed by Chile, which invests US\$ 1,190.55.

Table 9

Peru: Human resources density in health per 10,000 inhabitants

	2012	2013	2014	2015	2016	2017	2018
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MEDICAL	11.3	11.5	11.9	12.2	12.7	12.8	13.6
NURSE	11.2	11.8	12.7	12.8	13.5	14.1	15.6
OBSTETRA	3.9	4.1	4.7	4.6	4.8	5.0	5.3
TOTAL	26.4	27.4	29.3	29.6	31.0	31.9	34.5

Note: Source: Ministry of Health (2018)

The World Bank established the number of doctors per inhabitant, determining, according to the countries of the world, the varied relationship that shows the interest of each country in health. Thus, there are countries such as Afghanistan with a ratio of 0.3 per 10,000 inhabitants and, in extreme contrast to Germany with 4.0, Peru has 1.3 doctors per 10,000 inhabitants. According to the 2005 census, Peru has a ratio of 10 physicians per 10,000 inhabitants. If the Latin American average of 21.6 is taken as a reference, Peru is below half the rate.

Discussion and conclusions

The Cusco region through the Directorate of Health has demonstrated deficiencies in the management of basic strategic programs; its indicator of malnutrition and anemia is increasing, which puts on alert more complex situations such as the management of diagnostic diseases and complex treatment as degenerative pathologies, and eventually endemic or pandemic health situations. Thus, academic events, access to Internet forums, and the globalization of information itself provide enormous opportunities for access to knowledge that will help to understand the problems that other countries have experienced or are experiencing, and to understand in a broader context the occurrence of diseases and to eventually undertake solutions.

An inconvenience detected in the protocol of health provision for chronic-degenerative diseases in the Regional Hospital of Cusco revealed that the problem was not superficial, it was just the tip of the iceberg, it had a structural origin that in a systematic and sustained way was becoming more acute. The problem of the regional and national public health system has been atomizing and with it eventual solutions have been dissipating and losing their effectiveness as a consequence of the growing complexity of the diseases and the anachronism of the health system.

The first result consists of levels as described below. Firstly, the implicit notion of a structure based on the general theory of structures in its two aspects, from the perspective of Bertalanffy or objective theory, and that of Luhmann or sociological theory. The second refers to the concepts of the human condition and its relationship with habitability and entropy. Thirdly, health in the scenario of habitability; finally, and central to the result, the concepts of health itself, such as the transition in health understood from its three subsequent transitions: epidemiological, sanitary and demographic; organizational models in health systems, and health paradigms.

Thus, today there is a theoretical framework that explains with relative clarity the context of the health problem and the challenges faced by the ministry of the sector. The study demonstrates the conditioning that occurs between the determinants of health and the transition of diseases; it shows how inadequately the State is organized to manage the epidemiological profile, and how certain population niches are vulnerable to certain diseases. The global vision of the health problem built on the foundations mentioned above will allow those directly involved to assume their functions and competencies in the context of the redesign of the regional public health system with the autonomy recognized by law, and in coordination with the national system.

The study determined, based on statistical data and respective reports, that special attention should be paid to the fact that hospitals base their service portfolios on the demand for services and not simply on criteria of functionality. In this regard, the study specifies two fundamental aspects to propose the redesign of the public health system. The first one is that the national referral and counter-referral system is in crisis and that the obtaining of quotas in national hospitals or institutes in the capital to refer patients with reserved diagnoses is prolonged so that the provision of health care is not timely. The second, that the prevalence of noncommunicable diseases with complex diagnosis and treatment does not have the adequate resolution capacity, that is, the quality of the hospital infrastructure is questioned, the quality of the biomedical equipment, and finally, the human resource is not properly trained. Obviously, the study focuses its interest on investigating the epidemiological and demographic transition, as well as societal typologies and to demonstrate that the prevalence of nontransmissible and re-emerging diseases are those that have been affecting the population, so that the public attention system must be redesigned to be within the reach of the population. In that sense, the redesign of the public health care system of the third level of the Cusco region implies the construction of the Specialties Hospital III-E, the Antonio Lorena Hospital remains with the category III-1 and the current Regional Hospital becomes the Regional Emergency Hospital, in this way the references to national hospitals and Institutes of the capital are reduced notably, so that the regional public health care system becomes a ring of containment of the diagnosis and treatment of prevalent noncommunicable diseases, strengthening in this way the national network.

With respect to the specific objectives these have been fulfilled with the necessary evidence according to the following detail:

The study found that the disorganization in the provision of the service of the regional public health system is due to the hospital organizational model that generates a negative perception of the service as a consequence of the bad provision and in the delay of this one as it indicates the model of linear regression for the predictor of population that does not look for attention for delay in the attention and the model of linear regression for the predictor of population for lack of confidence. Another disorganizing aspect of the system is the proportion of physicians per inhabitant, which is below the international standard, as demonstrated by the Pan American Health Organization. The budget gap has been increasing every year to the point that it puts the health system's operations at risk; in this regard, it has been demonstrated through a review of the personnel assignment table that those in charge of budget requirements do not have the necessary professional qualifications, the procedures manual is not explicit and in general there is no involvement of workers in the labor functions.

The study showed that the causes of nonconsultation in health facilities due to chronic disease are due to the poverty levels of the population classified by per capita expenditure, the location of the health center according to urban or rural environment, functional literacy, health insurance ownership, family violence, human development index, migration and urbanization processes, and access to basic services. However, a determining aspect that was addressed in the study refers to the lifestyle and consumption habits that come as a result of the globalization spread through the media.

In relation to the fifth and last specific objective of determining the deficiencies of the state's insurance system affecting the accessibility of health treatment in hospitals in the Cusco region, the study has verified that the population's subsidized health care reaches expected levels of coverage, that is, that the joint insurance system tends to cover one hundred percent of the population, and that the health care package of the comprehensive health insurance is no longer basic but also covers chronic degenerative diseases.

Conclusions

Lack of previous research studies in the region

The study was limited by the fact that there are no research studies specifically related to the health transition in the Cusco region, that is, the three transitions are analyzed together; and specifically the health transition that made it difficult to fulfill the objective of identifying the causes that motivate the "non consultation" due to chronic disease; on the other hand, the regional health situation analyses do not systematically focus on the deficiencies of the organizational model of which they are a part, and which motivates the population not to go to hospitals.

Lack of available and/or reliable data

The law regulates the elaboration of the health situation analysis in hospitals (ASISHO) every four years; so that the information it shows allows the identification of the tendencies in the health indicators and to propose alternative strategies of delivery; this information should allow the identification of the phase of epidemiological transition in which the region is; the hospitals of the region do not have this document; therefore, the lack of specific data is a limitation.

Recommendations or prospective

It is recommended to persist in research works referred to the sanitary transition with the purpose of deepening in data about the deficient situation in which the regional hospital organizational model is found, which prevents people from having a positive perception of the health benefits of the public system that affects the population with chronic-degenerative disease. It is emphatically recommended to carry out research work to strengthen the first level of care alternatively. In a preliminary way, the study has demonstrated the need to invest in hospitals of greater complexity in the region to attend to increasingly complex communicable diseases; but it is also necessary to control diseases in the prevention and early diagnosis phase.

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