The Situation of the Health System in Peru to 2021 and the Pending Agenda

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This descriptive research seeks to identify and present the situation of the Peruvian health system in 2021, as well as to propose the schedule pending for the sector, proposing the contrast of the evolution of health spending with the previous periods, comparatively with other countries of the Latin American and European region. The problem of human resources in the sector is analyzed, and finally, the infrastructure gap of the first level of care is identified. It is concluded that the health sector needs a sustained increase in a greater proportion of the general budget of the republic, as well as the decentralization of the PNA.

Keywords: health, PNA, spend, infrastructure, COVID-19

INTRODUCTION

Peru has universal access gaps: in general, universal access gaps in public services, and in particular, gaps in access to health services. In addition, there are growth and development purposes in the context of a global economy with a health emergency. The gaps and limitations have deepened in the context of an emergency caused by COVID-19 that persists in the country. The absence of effective short- and long-term policies to get out of the crisis is a limitation for various social sectors that seek to get out of the family recession and resume their ventures.

The economic, macroeconomic, and microeconomic policies for the development of various financial and non-financial markets required to resume the paths of growth can be designed, strengthened and/or made more effective through economic research, the analysis of sectoral databases, the study of current policies and the evaluation of the finances developed by carrying out impact assessments transversally, monitoring and control of the policies implemented or the evaluation, analysis, and research of suitable policies to get out of the crisis and achieve an adequate development of the markets.

The purpose of this article is to review the studies that have been brewing and reveal the state of the health system in Peru in order to raise the research agenda to evaluate policies and propose new policies that contribute to economically overcoming an economic and health crisis in which the country is plunged, and contribute with these medium-term measures to the economic take-off of families in a new post-pandemic context, to resume the path of growth and sustained development, overcome the restrictions that families have faced in a context of global health crisis and maintain a sustainable family economy.

METHODOLOGY

The present research performs a descriptive analysis of the situation of the health system in a specific way. The main theories of various authors that explain the functional relationships of health concerning the economy are reviewed. The collection of open data provided by national organizations such as Instituto Nacional de Estadística e Informática (INEI) ("National Institute of Statistics and Informatics"), Banco Central de Reserva del Perú (BCRP) ("Central Reserve Bank of Peru"), Ministerio de Salud (MINSA) ("Ministry of Health"), and Ministerio de Economía y Finanzas (MEF) ("Ministry of Economy and Finance"), and international organizations such as the Bank, is collected, working on software such as Microsoft Excel and R Studio with the main purpose of elaborating and schematizing percentages and statistical tables that allow explaining and demonstrating the situation of the health sector.

RESULTS

Theoretical Background

One of the needs of economic science is to enrich itself with particular experiences to validate the various economic models that have been developed over time and propose new models derived from these experiences. In general, the analysis of the health sector can be carried out from the basic model of supply and demand at the macroeconomic and microeconomic levels. However, studying certain realities such as Peru enriches the discussion and updates the theoretical contents presented to date, especially in a global and digital economy context.

Health economics is the branch that studies scarcity in the health system of an economy. From that point of view, we can find studies of scarcity in the health system; from the macroeconomics of health, which reviews the study of macroeconomic aggregates concerning the health situation experienced by economic agents; and the microeconomics of health, which studies the behavior of individual agents participating in the health system.

In the theoretical corpus of Economics, health acts as a conditioning factor for the productivity of human capital. Economic growth models are considered a determining factor of growth levels and human capital contributions. On the other hand, it is a service that people access, and health financing is a source of debt or spending for governments and an important spending variable for many families. A situation of poor health and excessive financial burden for families can generate a negative effect on consumption levels, as well as an increase in government spending that limits the economic growth potential of a country and hinders economic development.

The producers in the health services market are physicians, nurses, psychologists, dentists, and other health personnel. Likewise, clinics, laboratories, blood banks, diagnostic centers, and hospitals of different levels can attend a level of superficial layer (common diseases) or complex layer (chronic or degenerative diseases). On the other hand, the consumers who represent the demand are those who demand the services. This market is imperfect because in the transaction, there is a relationship of asymmetry for who uses the service (consumer), the one who provides the service (the doctor, hospital, laboratory) and the one who pays (which can be the user himself or some financier), who is finally the one who faces the price and who can transfer it to consumers or their guarantors as the case may be. In all this relationship, the lack of medical knowledge is the main source of asymmetry for agents in this sector. Likewise, there are competition problems because some services are only provided by certain facilities, generating a difference in power between the power of the consumer and the power of the producer, adding to the limitations of information that the person who finances the transaction may have.

In these efforts to simplify the reasoning described and model behavior to predict it, we find the Lalonde Model (1974) in which it is based that health is not only linked to biological but socioeconomic factors mentioning the following: biology, environment, lifestyle, and the health system with the weights of 27%, 19%, 43%, and 11% respectively. We also have the Model proposed by Evans and Stoddart (1990), which focused on the factors that determine why health services have disparately imputed the causes mainly to economic disparities that affect the public health system at an aggregate level and that explain the

prevalence of diseases and the tendency to maintain the level of sick population. Finally, we can cite the so-called theory of public finance, whose leading exponent is Richard Musgrave (1959); his proposed model explains the purposes that a public health system must have to promote economic growth: a) improve the allocation of productive resources, b) improve income and public spending, c) distribute income to the poorest people.

Economic studies such as those of Aldunate and Martner (2006) have shown that in Latin America and the Caribbean a fiscal policy is maintained that generates an increase in health spending but suggests the feasible possibility of an autonomous financing mechanism. On the other hand, Lavado, Pablo (2007) explained that any social program, including health, can be evaluated by the quality of spending, which in turn has a determination by the capacity of collection and financing of the government. Cortez, Rafael (2002) highlights the importance of the health issue for the national economy, and that improves the management of the sector with the growth of the availability of the sector's database. Finally, it is worth mentioning Grossman, who, based on the theory of human capital, explains that there is a demand for a health-oriented search for inputs that offer health but do not seek medical care, segmenting it and identifying from this behavior people who invest in their care to increase their income, resulting in a positive effect on the economy.

These economic modeling efforts, as well as the conclusions of the studies obtained from the existing literature, demand their validation due to the contrast of these conclusions in a country with economic and social diversity and scarcity in the health system. On the other hand, research and inference based on stylized facts in the country constitute opportunities for improvement in the theory of health economics to incorporate the diversity of levels of service and health that can present a country at the departmental and regional levels.

There are studies and economic models in the theory of health economics that review the health economy at a country's level without considering a mega-diverse baseline. In particular, it is of theoretical interest to model the economy, health and microeconomic and aggregate behavior of the agents of Peru and similar countries in the context of a pandemic, based on stylized facts in the Peruvian case at the departmental, regional, and other countries under the context of a health crisis and an increasingly globalized real and financial economy.

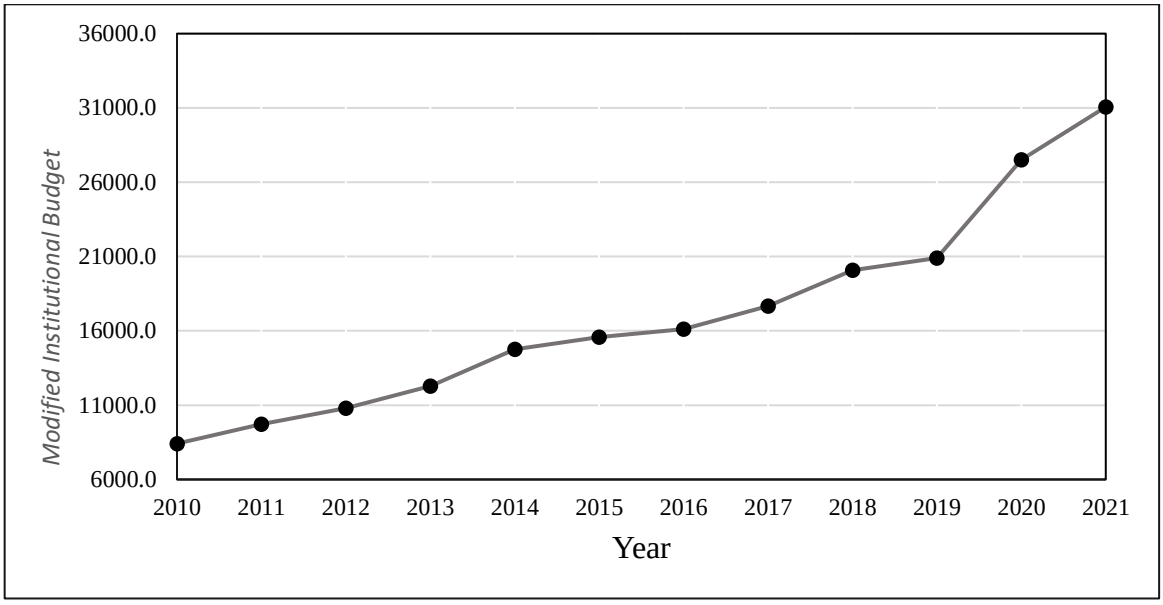
The Situation of the Health System in Peru

One of the significant limitations that people experience in Peru is access to health services. According to García-Calderón (2021), Peru invests 5.1% of GDP in the health sector, below the Latin American average of 7% and 9%. Of these percentages, 65% is a private investment. In comparison, 35% is a public investment, with a hybrid system (public and private) in the country with different access opportunities for the population that does not necessarily have the resources.

Health Sector Expenditure

It was found that the budget for the health sector has experienced sustained annual growth in Peru in the last 10 years.

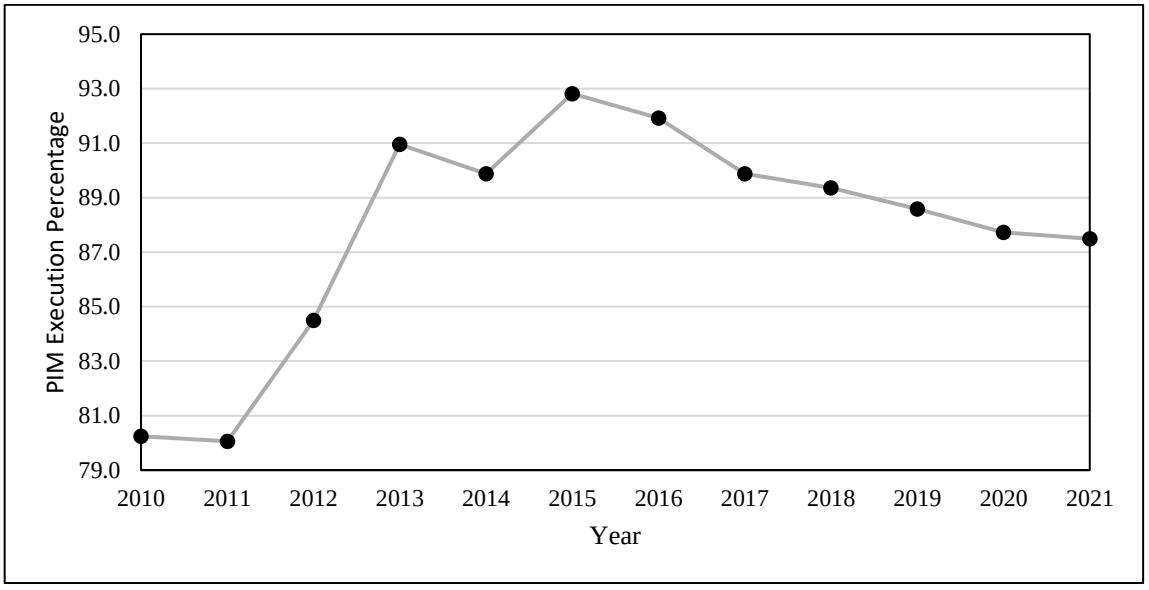
FIGURE 1
EVOLUTION OF THE MODIFIED INSTITUTIONAL BUDGET 2010-2021



Source: Ministry of Economy and Finance, Friendly Consultation. Own elaboration.

However, the execution of the PIM in the health sector (Modified Institutional Budget) has not reached more than 93% of execution in the last twelve years, with a downward trend from 2015 to 2021, a situation that contrasts with the expected results given that Peru required greater execution of spending because is one of the countries most affected by the COVID-19 pandemic.

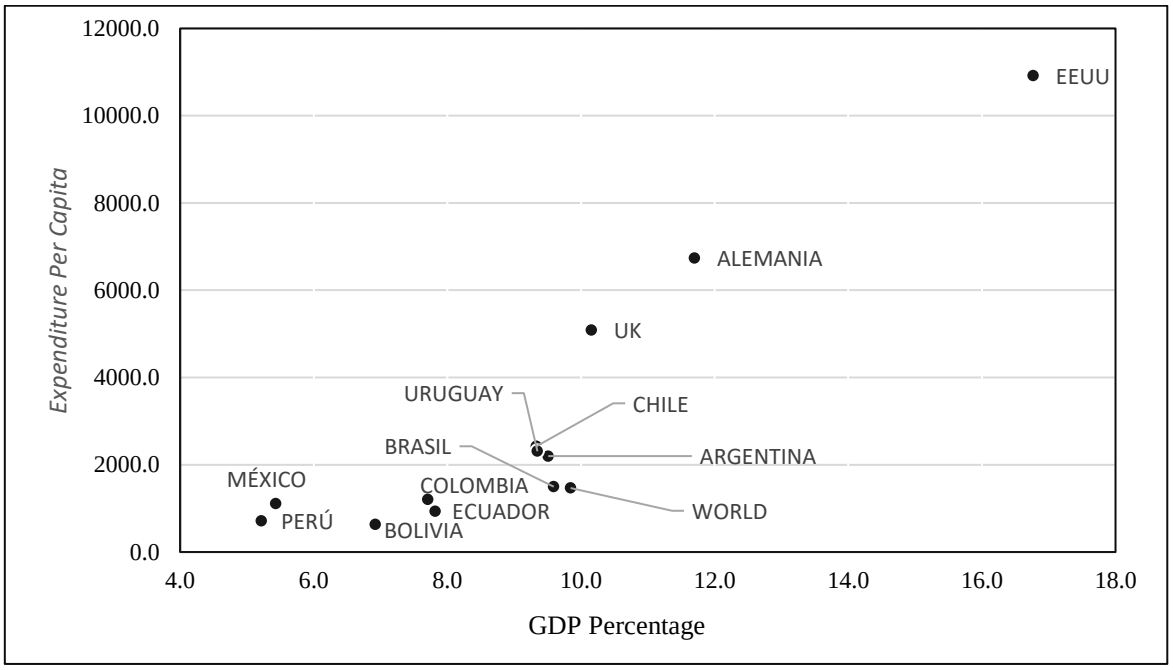
FIGURE 2
EVOLUTION OF THE IMPLEMENTATION OF THE PIM 2010-2021



Note: The PIM Execution Percentage (Modified Institutional Budget) with the accrual of the execution of the expenditure.
Source: Ministry of Economy and Finance, Friendly Consultation. Own elaboration.

At the international level, Peru's health spending as a percentage of GDP amounts to 5.2%, being below the Latin American average (including the Caribbean) with 7.8% and worldwide with 9.8%, which is a symptom of the problem at the national level. Following is a graph that synthesizes those mentioned above concerning international comparison.

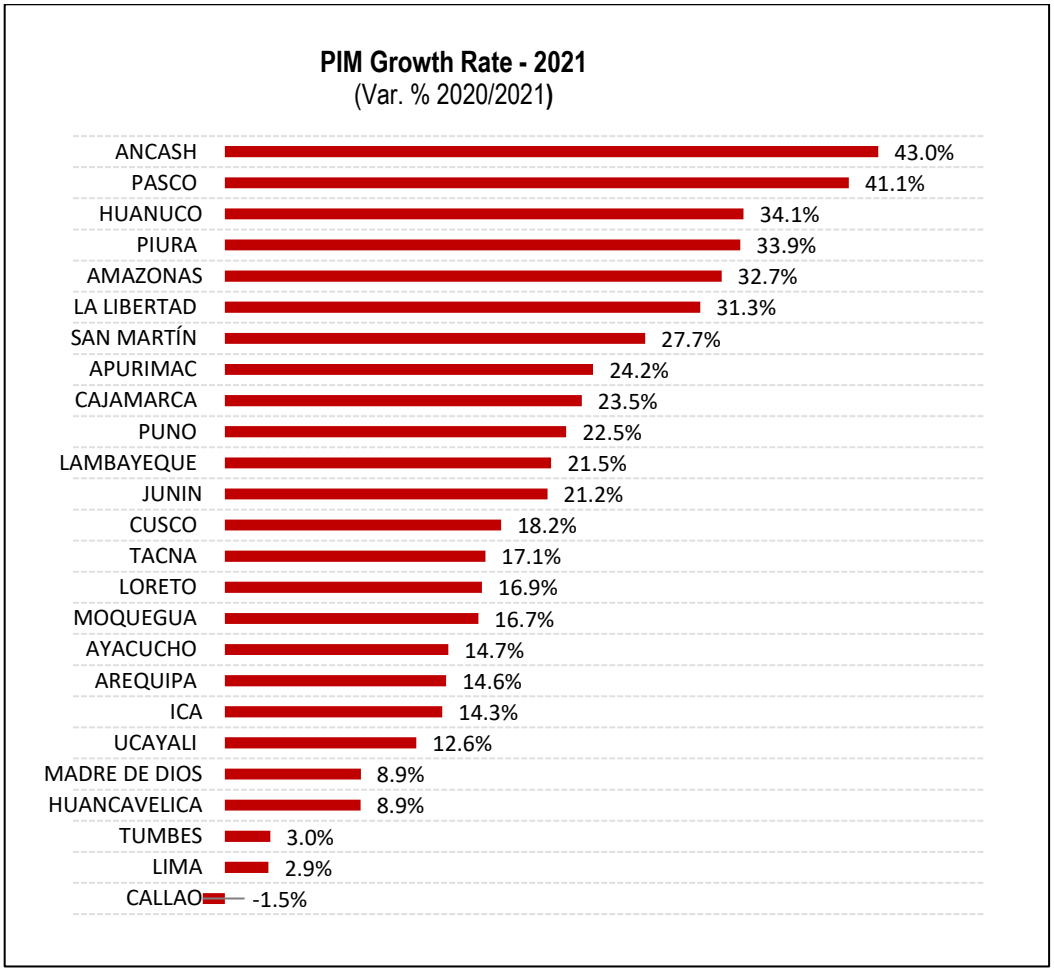
FIGURE 3
SCATTER PLOT EXPENDITURE PER CAPITA (US DOLLARS) AND GDP PERCENTAGE, 2019



Source: World Bank. Own elaboration.

The distribution of the budget to regional governments is subject to the needs of the regional population, as the allocation to them entirely varies, being more stochastic in the coronavirus pandemic. Below is a graph detailing the departmental level's growth rate (2020-2021) modified institutional budget.

FIGURE 4
THE GROWTH RATE OF THE MODIFIED INSTITUTIONAL BUDGET, 2021

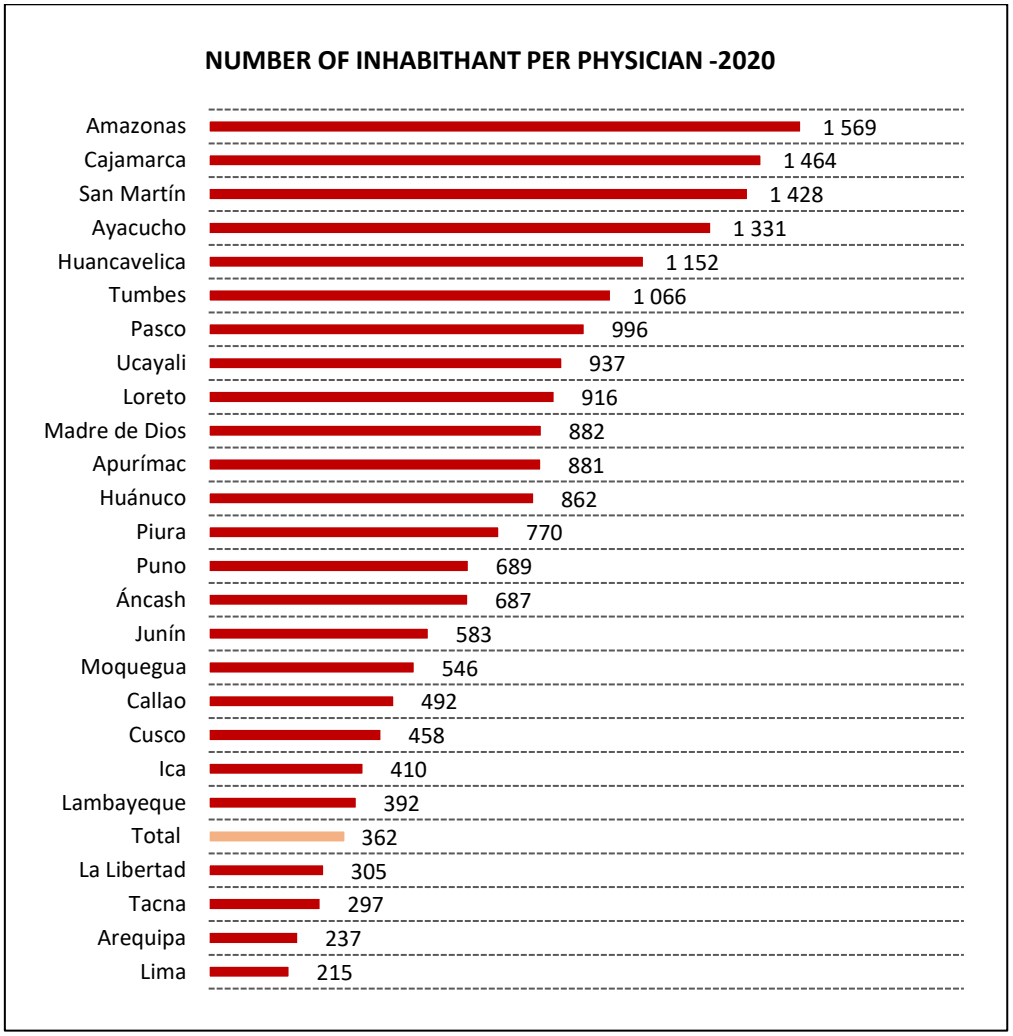


Source: MEF, Own elaboration.

The sick population is around 25% with an average annual growth rate of 0.6 percentage points per year, which is recorded before 2019. This growth of sick people has deepened with the COVID-19 pandemic, having become evident a collapse in the supply capacity of the public sector to meet the increase in demand for health at the national level.

Additionally, in Peru, there are 12 physicians for every 10,000 inhabitants, a critical figure being the world average of 13 physicians per 10,000 inhabitants. Both figures do not reflect the ideal of an expected average, considering that the world average includes countries with a precarious health system and that the national average hides the greater representativeness of Lima and Callao in the national average, compared to the absence of assistance in the interior of the country. According to the OECD cited in García-Calderón (2021), the increase in doctors should be prioritized to reach the average and improve the quality of health perceived by the population. On the other hand, in the context of COVID-19, the need for hospitals, as well as access to medicines, has reflected the need to increase health services per inhabitant in the country.

FIGURE 5
GRAPH OF THE NUMBER OF INHABITANTS PER PHYSICIAN IN 2020



Source: National Institute of Statistics and Informatics (INEI). Own elaboration.

The situation becomes critical as a deficit of health professionals added to the high rate of disapproving the Examen Nacional de Medicina (ENAM) ("National Test of Medicine"). According to Mendoza et al. (2021), about 4 out of 10 students disapprove ENAM test, inferring that a significant percentage of health professionals would not be suitable to perform SERUMS (Rural and marginal urban health service).

Decentralization of the Health Sector

During the current development of the coronavirus pandemic (Sars-Cov-2), the first level of care plays such an essential role that ministerial Resolution No. 182-2020-MINSA (2020) established six guidelines to counteract the advance of the Coronavirus aimed at the first level of health care; it is also concluded that "the First Level of Care (PNA, Spanish Acronym) is in a unique position to manage the needs of the population during the COVID-19 pandemic" (Villanueva et al., 2020). Given this relevance, it is pertinent to describe the structure of the PNA.

TABLE 1
STRUCTURE OF THE FIRST LEVEL OF MEDICAL CARE, PERU

Structure of the First Level of Care	
I-1	Health Center
I-2	Health Center with Physician
I-3	Health Center without Inpatient
I-4	Health Center with Inpatient

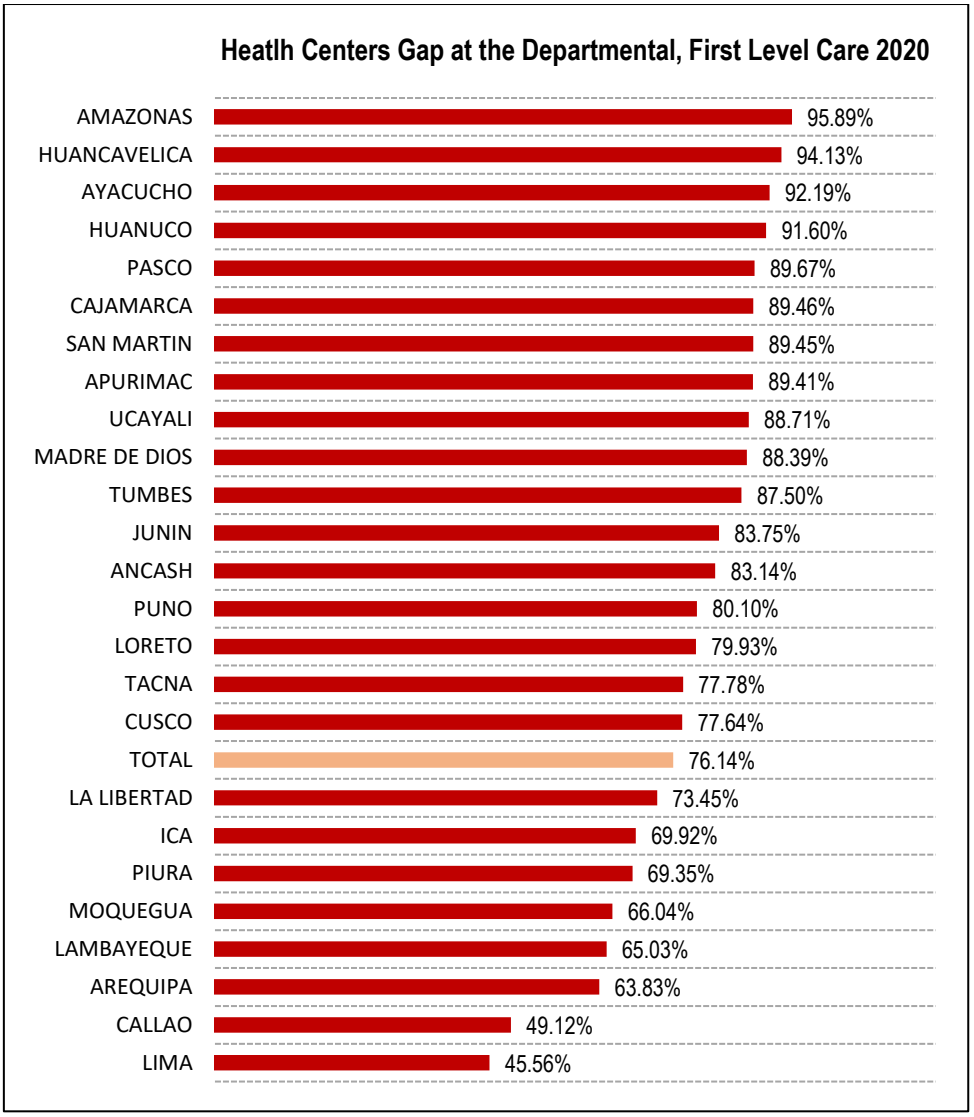
Source: MINSA. Own elaboration.

Since the PNA is the most crucial level of the health sector because they make up the leading establishments to which the population accesses, there is a need to strengthen it in order to provide a public service with a higher rate of action; as a response to this need, the decentralization of the first level of care is proposed. Authors such as Carciofi et al. (1996) propose decentralization to the municipal level so that the municipalities assume the autonomy of these medical establishments. Respect to its financing can be mixed both by the derivation of the budget of the sector to the local governments and by part of the own resources of the municipalities, which can achieve a greater collection through the taxation of their fees and/or taxes for providing such services protected by the Organic Law of municipalities that allows you to propose, create, exonerate, modify fees, taxes, licenses, and others.

Health Sector Gap

Health centers are subject to standards, within which the Technical Health Standard 133-MINSA/DGIEM-V.01 (2015) establishes parameters for the classification of health centers with the structural conditions of the buildings, as well as requirements for instruments (machinery and equipment) and personnel necessary for the proper functioning of the Health Center according to their respective level. At the primary level of care for the year 2020, the number of establishments with inadequate installed capacity was 8783, representing 76.14% of the total number of establishments.

FIGURE 6
GRAPH OF PERCENTAGE OF PNA CENTERS WITH INADEQUATE INSTALLED CAPACITY AT THE DEPARTMENTAL LEVEL, 2020



Source: MINSA, INEI. Own elaboration.

In the graph above, we can see how the first 10 departments have the largest installed capacity gap, according to Pulgar Vidal classification, which corresponds to the mountains and jungle, unlike the 8 departments with less than the gap corresponding to the coast. The Ministry of Health prepared projections of percentages of PNA establishments with an adequate installed capacity to operate for the years 2023, 2024, and 2025 and the percentages of gap closure[1].

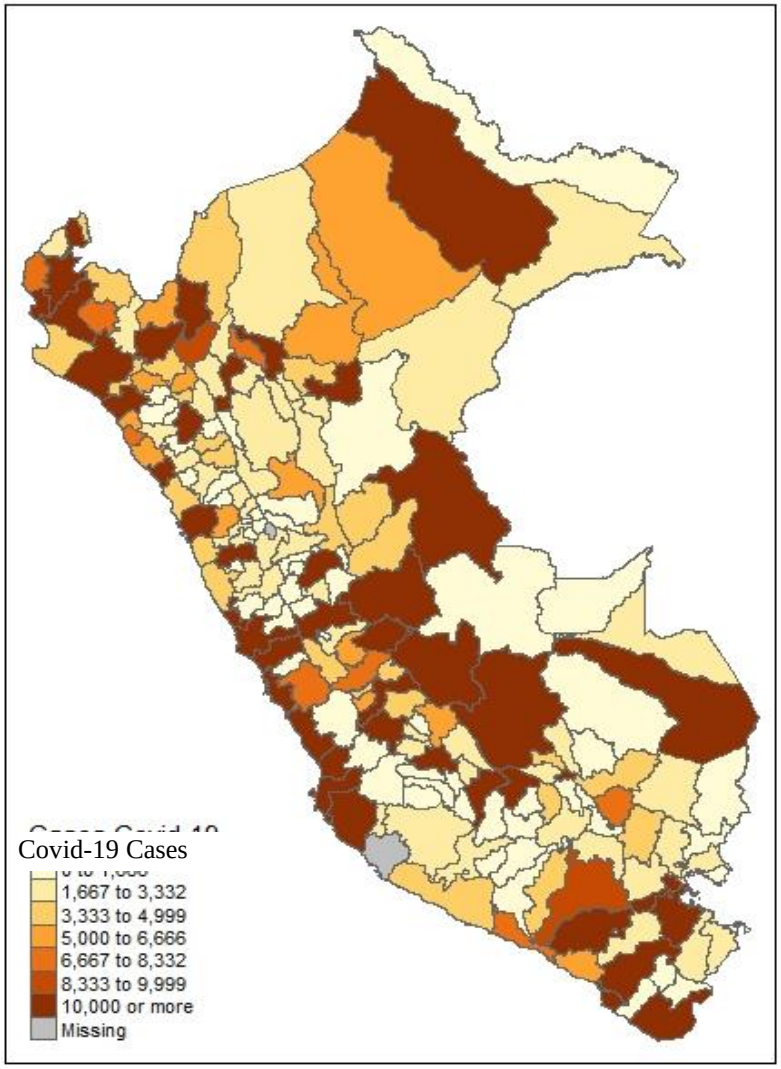
TABLE 2
MISA ESTIMATE OF ESTABLISHMENTS EVENTUALLY PUT INTO OPERATION 2023-2025

Health centers with adequate installed capacity			
	Years		
National Level	2023	2024	2025
PNA	291	557	640

Note: PNA, refers to the Health establishments of the First Level of Care
Source: MINSA. INEI. Own elaboration

Below is a graph outlining COVID-19 infections in Peru.

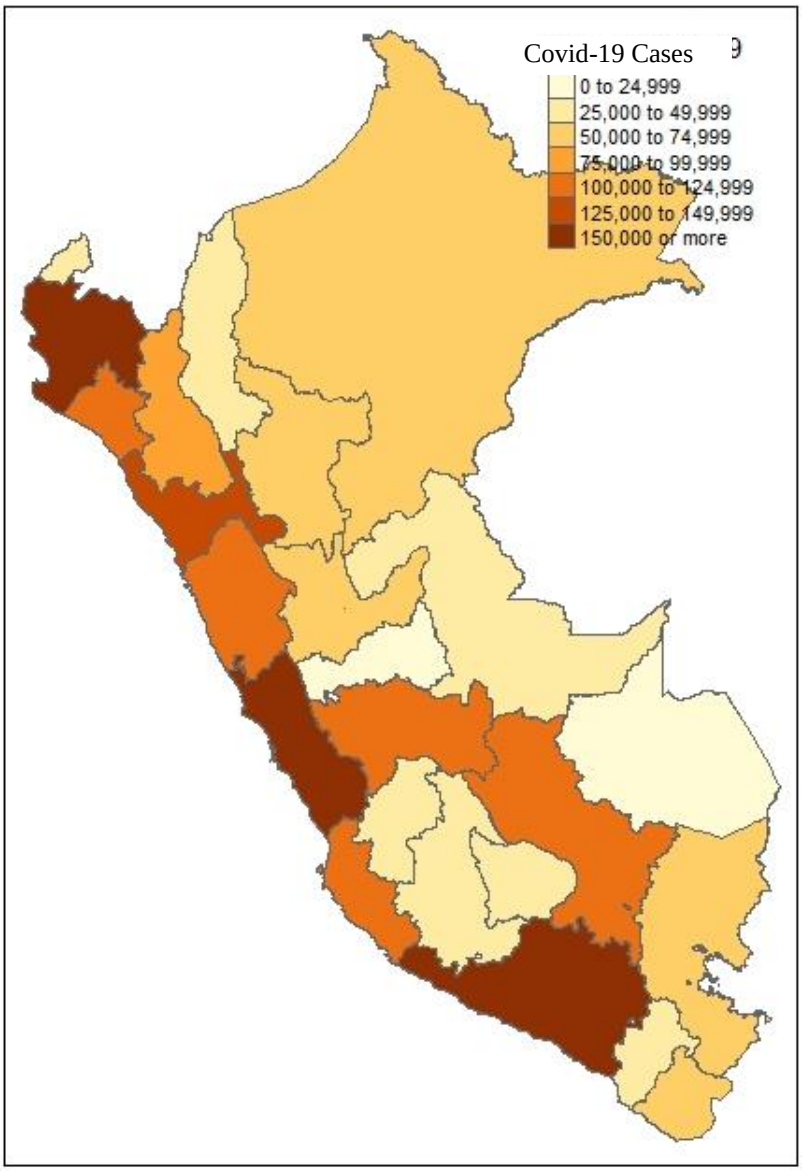
FIGURE 7
HEAT MAP OF COVID-19 CASES, PROVINCIAL LEVEL 2022



Note: Information updated as of March 3, 2022. It does not record information about the province of Nazca. Made in R Studio software.
Source: Data: Ministry of Health (MINSA). Own elaboration.

Analyzing in a more aggregated way the positive cases of covid-19 according to the administrative and political division that Peru has (a constitutional province and 24 departments), we obtain the following graph:

FIGURE 8
HEAT MAP OF COVID-19 CASES, DEPARTMENTAL LEVEL 2022



Note: Information updated as of March 3, 2022. Made in R Studio software.
Source: Data: Ministry of Health (MINSA). Own elaboration.

The previous graphs show that both the departments and seaside provinces reveal a more significant number of infections, which is explained by the demographic concentration and the dynamism of the productive sectors.

Pending Agenda

Health scarcity is the practical justification for the efforts required in research. The mechanism to provide access to the population of the interior of the country involves the injection of financing from the public sector, as well as a set of regulatory and/or defense policies in sectors where there are conditions of competition in order to promote the development of the market for public services in general, and in particular, the development of a timely health service for the population. The purpose of the investigations will be to identify the policies that need to be articulated and/or improved to make more effective the closing of gaps in the process of delivering health services to the population, which constitutes a right enshrined in the Political Constitution of Peru. Likewise, it is intended to reveal which policies implemented have not been effective in the process of delivering health services to the poorest at the national level to propose the necessary measures so that the service, financing, and access reach the population that has been left out in the context of a global pandemic.

CONCLUSIONS

It is necessary to reduce gaps and disparities in access to health services and disparities in the quality of service for those who do access. Being the health sector, a sector whose demand derives from the exposure of people to working conditions or preventive health, macroeconomic analysis of the macro indicators linked to the health sector is required to make effective the policies of investment in health. Microeconomic analysis to study the expenditure of families, identify particular behaviors derived from the popular idiosyncrasy in the interior of the country that defines the traits of culture and preferences of the health of the people of the coast, mountains, and jungle of Peru, to develop comprehensive policies that contribute to universal access, the development of efficient markets and fewer information asymmetries.

The health sector needs greater sustained increases concerning the budget due to the existing infrastructure gap that is most frequently accentuated in geographical sectors such as the mountains and jungle, as well as mentioning that the expenditure allocated is one of the lowest in the Latin American and Caribbean region as well as in the world average.

The rate of medical personnel in Peru who approve the ENAM is 60% of the applicant population, which indicates a low performance of the professionals who subsequently perform the SERUMS.

Highlight that the government proposes very optimistic goals, auspicious with respect to specifying the number of establishments that will enable (condition: adequate installed capacity), taking into account the low percentage of gross domestic product that is destined for the health sector.

The decentralization of health facilities from the first level of care is proposed based on the experience of Chile analyzed by Carciofi et al. (1996), where municipalities will be able to dispose of their means of collection for the financing of establishments.

In the case of Peru, both departments and seaside provinces reveal a greater number of COVID-19 infections, which is explained by the demographic concentration and the dynamism of the productive sectors in the seaside areas of Peru, as well as the weaknesses in infrastructure and quality of the health service made available to the population in the interior of the country.

Considering what has been pointed out by Carciofi et al. (1996) and the author's experience, in response, it is proposed to grant necessary autonomy to health facilities through a law authorizing the administration, as well as financing where the balances of the canon are derived to the economic financing of the PNAs, in the capacity of authorization, implementation, and construction of new establishments according to the need of the population. This will require the preparation and subsequent enactment of laws indicating the derivation of the balances resulting from the canon to PNA administered by local governments. The form and character of the proposal must conform to the corresponding regulations considering a cost-benefit analysis.

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ENDNOTE

1. See more in detail in Table No. 4 Annex.

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APPENDIX

TABLE 3
TABLE OF PERCENTAGE CHANGES IN PIMS CONCERNING THE PREVIOUS PERIOD AND PERCENTAGE OF GDP REPRESENTED

Percentage Changes in PIM previous period and percentage of GDP represented						
Year	2019		2020		2021	
DEPARTMENTS	Var % (2019/2018)	% GDP	Var % (2020/2019)	%GDP	Var % (2021/2020)	%GDP
AMAZONAS	-50,8%	0,04%	16,1%	0,05%	32,7%	0,05%
ANCASH	-1,1%	0,08%	35,4%	0,11%	43,0%	0,13%
APURIMAC	-6,1%	0,06%	6,6%	0,07%	24,2%	0,07%
AREQUIPA	8,0%	0,10%	15,8%	0,13%	14,6%	0,12%
AYACUCHO	8,7%	0,09%	11,5%	0,10%	14,7%	0,10%
CAJAMARCA	2,8%	0,10%	19,2%	0,13%	23,5%	0,13%
CALLAO	4,7%	0,08%	23,5%	0,11%	-1,5%	0,09%
CUSCO	3,4%	0,11%	18,3%	0,14%	18,2%	0,13%
HUANCAVELICA	24,3%	0,05%	16,9%	0,06%	8,9%	0,05%
HUANUCO	8,5%	0,06%	11,3%	0,08%	34,1%	0,08%
ICA	4,6%	0,05%	33,7%	0,08%	14,3%	0,07%
JUNIN	3,9%	0,10%	21,9%	0,12%	21,2%	0,12%
LA LIBERTAD	-5,1%	0,10%	10,1%	0,12%	31,3%	0,13%
LAMBAYEQUE	2,2%	0,07%	20,6%	0,08%	21,5%	0,08%
LIMA	4,8%	1,09%	53,4%	1,80%	2,9%	1,52%
LORETO	15,0%	0,08%	18,6%	0,11%	16,9%	0,10%
MADRE DE DIOS	3,8%	0,02%	14,1%	0,02%	8,9%	0,02%
MOQUEGUA	-7,0%	0,02%	46,4%	0,03%	16,7%	0,03%
PASCO	16,3%	0,04%	-20,1%	0,03%	41,1%	0,04%
PIURA	26,0%	0,11%	24,3%	0,15%	33,9%	0,17%
PUNO	11,4%	0,09%	19,9%	0,12%	22,5%	0,12%
SAN MARTIN	-0,1%	0,06%	19,8%	0,08%	27,7%	0,08%
TACNA	2,9%	0,04%	-5,3%	0,05%	17,1%	0,04%
TUMBES	-2,9%	0,02%	39,1%	0,03%	3,0%	0,02%
UCAYALI	21,3%	0,06%	-7,2%	0,06%	12,6%	0,05%

Note: GDP 2019 amounted to 770532,482 million soles, for the year 2020 it amounted to 717398,333 and finally for the year 2021 it was 871977,595 million soles.
Source: BCRP and INEI. Own elaboration.

TABLE 4
PNA HEALTH FACILITIES GAP WITH INADEQUATE INSTALLED CAPACITY, PROJECTING THE YEARS 2023-2025, YEAR 2021

DEPARTMENT	BASE YEAR 2021	GAP YEAR 2023		GAP YEAR 2024		GAP YEAR 2025	
	ES	ESI	%ESI	ESI	%ESI	ESI	%ESI
AMAZONAS	480	472	98,33%	452	94,17%	448	93,33%
ANCASH	413	402	97,34%	393	95,16%	392	94,92%
APURIMAC	383	366	95,56%	349	91,12%	345	90,08%
AREQUIPA	290	279	96,21%	269	92,76%	267	92,07%
AYACUCHO	361	332	91,97%	317	87,81%	313	86,70%
CAJAMARCA	865	840	97,11%	815	94,22%	799	92,37%
CALLAO	84	80	95,24%	79	94,05%	77	91,67%
CUSCO	355	342	96,34%	324	91,27%	324	91,27%
HUANCAVELICA	406	376	92,61%	358	88,18%	351	86,45%
HUANUCO	328	319	97,26%	307	93,60%	298	90,85%
ICA	165	163	98,79%	161	97,58%	161	97,58%
JUNIN	531	519	97,74%	499	93,97%	491	92,47%
LA LIBERTAD	318	299	94,03%	291	91,51%	289	90,88%
LAMBAYEQUE	199	195	97,99%	191	95,98%	189	94,97%
LIMA	846	830	98,11%	818	96,69%	818	96,69%
LORETO	456	438	96,05%	414	90,79%	409	89,69%
MADRE DE DIOS	99	99	100,00%	96	96,97%	93	93,94%
MOQUEGUA	69	67	97,10%	62	89,86%	60	86,96%
PASCO	267	258	96,63%	257	96,25%	257	96,25%
PIURA	436	422	96,79%	418	95,87%	414	94,95%
PUNO	471	455	96,60%	434	92,14%	433	91,93%
SAN MARTIN	383	375	97,91%	364	95,04%	361	94,26%
TACNA	98	94	95,92%	93	94,90%	90	91,84%
TUMBES	54	50	92,59%	47	87,04%	47	87,04%
UCAYALI	220	214	97,27%	212	96,36%	211	95,91%
TOTAL	8577	8286	96,61%	8020	93,51%	7937	92,54%

Source: BCRP and INEI. Own elaboration.
*ES: PNA Health Facility
**ESI: PNA Health Facility with Inadequate Installed Capacity