Report on the model of decentralized management for selected national health priorities, including activities performed and recommendations for their implementation

Proposal for the prevention and control of malaria based on the decentralized management experience to reduce children malnutrition in the San Martin Region

USAID/Peru/Politicas en Salud

Contract No. GHS-I-10-07-00003-00

October 2011

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This document has been elaborated by USAID|Peru|Politicas en Salud Project, financed by the United States Agency for International Development (USAID) under contract No. GHS-I-10-07-00003-00.

Report on the decentralized management model for the selected national health priorities

Contents

Abbreviations and acronyms

AMPE	Association of Municipalities of Peru
ANGR	National Assembly of Regional Governments
DALY	Disability Adjusted Life Years
CAS	Service Administration Contract
CCL	Local Coordination Council
CCR	Regional Coordination Council
CIGS	Intergovernmental Health Committee
CLAS	Local Committees for Health Administration
DDT	Dichloro diphenyl trichloroethane, insecticide
DIRESA	Regional Health Directorate (Bureau)
DHS	Demographic and Health Survey
ESN	National Health Strategy
ESN-PCEM OTV	National Health Strategy for the Prevention and Control of Metaxenic and other Vector-Borne Diseases
LGS	General Health Law
LOF	Organization and Functions Law
LOPE	Executive Power Organic Law
MEF	Ministry of Economy and Finance
MOH	Ministry of Health
OPS	Pan American Health Organization
PAMAFRO	Project for the Control of Malaria in Border Zones of the Andean Region
PCM	Presidency of the Council of Ministers
PCMOEM	Program for the Control of Malaria and Other Metaxenic Diseases
PEM	National Program for the Eradication of Malaria
PpR	Results-Based Budget
REMURPE	Urban and Rural Municipalities Network
SERUMS	Rural and Urban Marginal Health Service
SIAF	Integrated System for the Government's Financial Administration
SIS	Comprehensive Health Insurance
SNEM	National Service for the Eradication of Malaria
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

Summary

As from year 2006, the health functions in Peru were transferred from the central level to the Regions and there is as yet no decentralized management model for public health priorities.

Malaria is a health priority in the country since 70 percent of its territory has ecological conditions which favor its transmission, and outbreaks of this illness might occur if no routine prevention and control measures are maintained.

In 2004, the Ministry of Health created the National Health Strategy (ESN) for the Prevention and Control of Metaxenic and Other Vector-Borne Diseases. However, the organization and management for this National Strategy were designed prior to decentralization. This fact has developed informal and non-systematic management mechanisms that co-exist with routines that are deeply rooted in the regions. In addition, there remains a disjointed operation because the functions and activities are distributed among several institutions and health offices of the Ministry of Health, health regions and local governments.

The findings of the review conducted for this paper, as far as the impact of decentralization on public health programs, show that decentralization processes are heterogeneous in the different countries and that the implementation of decentralization had a circumstantial adverse effect on the control of malaria as a result of changes introduced in the financial flows, in the operating personnel, and in the information and surveillance systems. Notwithstanding, most of these problems were solved within short periods of time.

In Peru, there is tension between a centralized management scheme of health priorities and its coexistence with the implementation of a more integrated horizontal scheme, in which regional governments also participate without a management model adapted to the decentralized health system.

This concept paper proposes a methodology for the prevention and control of malaria in a decentralized health system based on the regional management's experience with reducing childhood malnutrition. The design and implementation of this management model are in charge of the San Martin Region with the technical assistance from USAID / Políticas en Salud.

The methodology used has a bottom-up approach with which the regional technical team identifies and prioritizes effective interventions and defines the nature of the services delivered to users for a selected health priority. Subsequently, the delivery of key services is assessed and the limitations or problems preventing an effective, efficient, timely and quality service are identified. The next step is an analysis of the reasons underlying the restriction to the formulation of proposals for their elimination or reduction, within the framework for the strengthening of regional institutions and the decentralization of the health sector.

The restrictions of a regional government to implement an effective intervention or expand the coverage of services may be grouped into: i) management and organization, ii) management of human resources, iii) management of critical supplies, iv) management of information, v) management of current budget, vi) management of investment. The knowledge of these limitations faced by the regions is essential to estimate the resources necessary to improve management, expand the coverage of effective interventions, and strategic decision making about the forms of delivery, sequence of actions and level of expansion of the services.

The design of a decentralized management model for health priorities is done following these steps:

Stage 1. Identify the effective interventions and key services

Stage 2. Definition of priority geographical areas, target or beneficiary population

Stage 3. Establishing the coverage targets for effective interventions and services

Stage 4. Calculation of the costs and budget for the increase in coverage of effective interventions and services

Stage 5. Rapid evaluation of restrictions for the delivery of services and expansion of quality coverage

Stage 6. Calculation of the human resource gap in health

Stage 7. Design and management of the operation

Stage 8. Development of mechanisms for intergovernmental and inter-sectoral relations

1. Introduction

In Peru, as from year 2006, certain health functions were transferred from the central level towards the regions and, more recently, in 2009, the Presidency of the Council of Ministers issued Supreme Decree - DS 047-2009 which established the legal framework for the design of the public services decentralized management.

In the health sector, it is necessary to develop models for the decentralized management of services, especially those addressing national public health priorities, inasmuch as the operation of these services has not yet been adapted to operate in a decentralized system.

Malaria, specifically, is an interesting case for designing and validating a decentralized management model, since its control calls for the involvement of many players, who currently participate but in a non-articulated and non-systematized manner. This national priority is headed by the National Health Strategy for Metaxenic Diseases of the Ministry of Health, which has a leading role and is the ruler of the national policy, and oversees compliance with regulations. Regional governments are in charge of the conduction and operation of the prevention and control of malaria within their jurisdictions.

Seen in detail, the activities for the planning, surveillance, diagnosis, health care, vector control, health promotion and supervision targeted at the control of malaria are performed by different institutions: regional governments, Seguro Integral de Salud (Health Comprehensive Insurance), Instituto Nacional de Salud (National Health Institute), municipalities; and separate directorates of the Ministry of Health: General Directorate for Epidemiology, Directorate for Statistics and Health Information, General Directorate for People's Health, Directorate for the Promotion of Health, General Directorate for Environmental Sanitation. This circumstance gives rise to a disjointed and not very effective action which proves inefficient in situations of epidemic outbreaks, and imposes less attention on the routine measures for the prevention and control of malaria.

The funding for malaria prevention and control activities, as well as other public health priorities, is dependent upon the budget allocation to the regions, and in most cases not enough funds are allocated for the day-to-day operation or prevention expenses, because the tendency is to continue allocating resources to control outbreaks or epidemics.

Recently, malaria together with other metaxenic and zoonotic diseases have been included in the Results-Based Budget Program of the Ministry of Economy and Finance. This budget allocation method enables to define the extent of financing towards activities for the prevention and control of these diseases, linked to milestones or targets and following a causal logic. Nonetheless, the implementation requires adjustments on the decision of how much resources to allocate to each activity, the relation of physical targets with available resources, what to do to reach the targets, and how to ensure funding for preventive activities.

For the time being, there are no mechanisms or procedures assuring that the targets for surveillance activities, prevention and control of malaria shall be attained. The officials in the National Strategy and the Ministry of Health state that they have not enough resources to

exercise the management and supervisory roles. In some regions, the breach of national regulations and of preventive or surveillance activities has been recorded, without the central level being able to intervene inasmuch as there is no chance of allocating national resources to finance activities associated to functions already transferred to the regions.

In the regions, and nationwide, the malaria coordinators are functional positions not handling a budget but directly dependent on a Directorate which has other priorities to attend to. This situation limits the negotiation and leadership capacity and leaves in the hands of the regional authorities to allocate resources according to the current trend of events or their own agenda of priorities.

Furthermore, there is still an important shortage in the availability of health services and human resources in those regions where malaria is present. This is explained by an insufficient capacity to solve issues in health services, freezing of posts, low salaries, little incentive to work in rural areas and high turnover of personnel.

In this context, the office of the Vice Minister of Health and the National Health Strategy for the Prevention and Control of Metaxenic Diseases and other Vector-Borne Illnesses (ESN-PCEM OTV) of the Ministry of Health have requested technical assistance from USAID/PERU/Políticas en Salud for the design of an intergovernmental management model for the prevention and control of malaria within a decentralized health system. This technical assistance is coordinated with USAID's Amazon Malaria Initiative (AMI) and with the Panamerican Health Organization.

This paper reviews the decentralization situation in the health sector, the situation of malaria and the response from the government, as well as the effect of decentralization on public health and, specifically, on malaria. Furthermore, it proposes a methodology to design a decentralized management for the prevention and control of malaria based on the experience that USAID/Políticas en Salud is developing in the San Martin Region to attend to the chronic malnutrition of children.

2. Decentralization in the health sector in Peru

By Carlos Bardalez and Jaime Díaz

2.1 Background of decentralization of the health sector in Peru

In the Peruvian health sector, decentralization has been a policy guideline since the eighties. Herein below is a summary of the background to the health decentralization process dating back to that period until the present day.

Period 1980 – 1990

At the beginning and during a great part of this period a deconcentrated organization of the public health system was boosted, setting up Departmental Health Units (1) from which health services had been deconcentrated with authority and responsibility (2) in 1985. Notwithstanding, at the end of the period a landmark of utmost importance for the decentralization of health was the incorporation of twelve regions since 1990, made up of two or more departments. The legal framework of regionalization established that regions were to be organized on the basis of the transfer of functions, personnel, material resources, financial resources, and documentary material, from development departmental corporations and the deconcentrated bodies and units of ministries and central agencies, decentralized public institutions, investment projects and public companies existing in the regions (3). This decentralization was verified with the corresponding transfer of functions and resources (4,5) between the end of this decade and the beginning of the next one.

Within this framework, MOH was entrusted the responsibility to frame, supervise and evaluate health policies of national scope, regulate activities for the promotion, protection and recovery of health, and the administration of national hospitals (6).

Period 1990 – 2000

As from 1992, year on which the Congress of the Republic was dissolved, and regional governments were replaced by Consejos Transitorios de Administración Regional (CTAR)(*Transitory Councils of Regional Administration*). As a complementary measure, in that same year, the Regulations on the Organization and Functions of the Ministry of Health (7) were enacted, establishing that the main competencies in health had to be performed by the MOH keeping control of health programs. This marked a regression in the country's decentralization process. Lastly, it should be mentioned that in the middle of the period, the creation and installation of Local Committees for the Administration of Health (CLAS) were promoted, under the so called Program for Shared Administration managed and controlled by MOH at a national level.

Transition Period

The political transition, initiated in 2000, entailed a government democratization process which in turn arouse significant expectations with regard to the decentralization of the government, creating the conditions and momentum for the current decentralization process.

2.2 The current decentralization process

The current decentralization process began in 2002, with the amendment to the constitution (8) on the one hand, and the enactment of the Law on Decentralization Bases (9), and of the organic laws of regional governments (10) and municipalities (11), which established the legal framework to develop the process as from the creation of regional governments. It was established, as a national policy, to transfer the sector-specific competencies and functions required for their operation, defining five stages geared towards the transfer of functions from the national to the regional levels; in the penultimate stage, the transfer of sector-specific competencies was included, except for education and health which were considered for the last stage. Nevertheless, it is worth noting that the decentralization process developed to this date must be understood as an administrative transfer insofar as no actions have been conducted towards the development of the institutional capacities of regional governments as government bodies, and neither the estimation of resources necessary for the exercise of the transferred functions. Some clarifications ought to be made in connection with the regulatory framework supporting the current process:

- It stems from a constitutional mandate.
- It redefines the government's structure and organization, establishing three governmental levels.
- It modifies the power relationships within the government.
- It is aimed at improving efficiency in the management of government resources.
- It is focused on public management aspects.

It should be noted that the framing of Sector Organization Laws (LOF), still pending, is a requirement to continue with the decentralization process. In the case of the health sector, its Organization and Functions Act has not yet been drafted. The progress made in the current decentralization process is summarized in the table below:

Table Nº 2.1: Progress made in the decentralization process

Components	Policies
Regionalization and territorial organization	▪ Creation of regional governments in 2003. ▪ Regionalization was truncated due to the outcome of the regional integration referendum.
Transfer of responsibilities	▪ Partial delimitation of competencies and functions in the sectors. ▪ Not homogeneous transfer of functions among the sectors. ▪ Partial transfer of resources linked to functions.
Institutional adjustment and strengthening	▪ LOPE's extremely late approval and very limited implementation in ministries. ▪ Limited and heterogeneous progress in the organizational adjustment of the regional government. ▪ Little progress made towards the strengthening of institutional capacities at the various government levels.
Adjustment of administrative systems	▪ Little progress made towards the adjustment to the decentralization process in the national public management systems.
Intergovernmental leadership and articulation	▪ Formalization of the Intergovernmental Coordination Committee, not yet operational. ▪ Formalization and operation of Sector-Specific Intergovernmental Committees ▪ Decentralized governmental management incipient framing. ▪ Monitoring and evaluation of public policies.
Democratization of public management	▪ Formal citizens' participation in the participatory budgets and functioning of the CCRs and CCLs. ▪ Limited citizen participation in the formulation of regional and local public policies. ▪ Limited institutionalization of the authorities' accountability. ▪ Incorporation of transparency processes to governmental management.
Fiscal decentralizations	▪ Enactment of fiscal decentralization law, not yet implemented.

To better identify the current status of the process, it is useful to base this item on the identification of the decentralization process components.

2.2.1 Transfer of responsibilities

Delimitation of competencies and allocation of functions

A decentralization process requires a precise delimitation of competencies and functions among government levels so as to implement complementary actions and prevent a duplication of functions with the ensuing conflict of competencies. Accordingly, following the enactment of the LOPE in 2007, a series of regulations were issued on the preparation of matrixes for the delimitation of competencies and allocation of sector-specific functions. Notwithstanding, such task is still pending in the health sector, inasmuch as it is not clear which functions fall on the MOH and which functions would be transferred to local governments for primary health care management. Said delimitation is the main input for the drafting of the new law on the organization and functions of the MOH.

Transfer of functions to regional governments

In the health sector, the transfer of functions was developed through a negotiation process between the MOH and the regional governments, which agreements were embodied in the Medium-Term Transfer Plan for the period 2005 – 2009. This Plan consisted of a total of 16 functions and 124 specific attributes to be transferred in accordance with the established schedule.

While the transfer began in 2005, it finally concluded in 2008 as a result of the *"Decentralizing Shock",* i.e. a presidential announcement by Alan García in 2006 consisting of 20 governmental measures intended to deepen the decentralization process, and materialized through a series of supreme decrees related with the transfer of functions to regional and local governments (12), transfer of primary health care (13) and basic education (14) to the municipalities through pilot projects, the simplification of transfer procedures (15) among others. In this way, the title to sector-specific functions was accredited to regional governments through relevant resolutions issued by the PCM. The accreditation criteria, containing the requirements for the exercise of each function, were also established by mutual agreement between the MOH and the regional governments. Nonetheless, such transfer of title to functions must be accompanied with the financial resources associated to each function so that they may actually be performed, and with the corresponding sector-specific regulatory adjustment and transfer or development of their operational instruments. *Operational instruments* are understood to be the organizational or technological ways or methods required for the purpose. Otherwise, the transfer of functions would be restricted to an exclusively formal or bureaucratic dimension.

As far as the transfer of resources, it should be noted that during the period 2005 – 2006, the transfer of functions was not accompanied with the corresponding transfer of resources, whereas the transfer of functions made between 2008 and 2009 was partially covered by budget funds. Notwithstanding, after 2009, MOH increased some of the funds intended for the already transferred functions (SERUMS, investments, hiring of specialists) although under a central management (see tables Nº 2.2 and 2.3 and graph Nº 2.1). Furthermore, the Ministry of Economy and Finance transferred some of the resources on request, outside of the functions transfer process. Lastly, with regard to the transfer of operational instruments, this has not been carried out, establishing that several transferred functions cannot be exercised due to their non-existence or in the absence of the relevant regulatory framework.

Table Nº 2.2: Allocation of resources for SERUMS between the MOH and the regional governments (Million of Nuevos Soles)

	2009	2010	2011 (*)
National government	62.8	64.9	79.1
MOH	56.5	57.6	69.3
Interior Ministry	0.3	1.7	4.2
Defense Ministry	5.9	5.6	5.5
Regional governments	31.3	31.6	33.5
Total	94.0	96.6	112.6

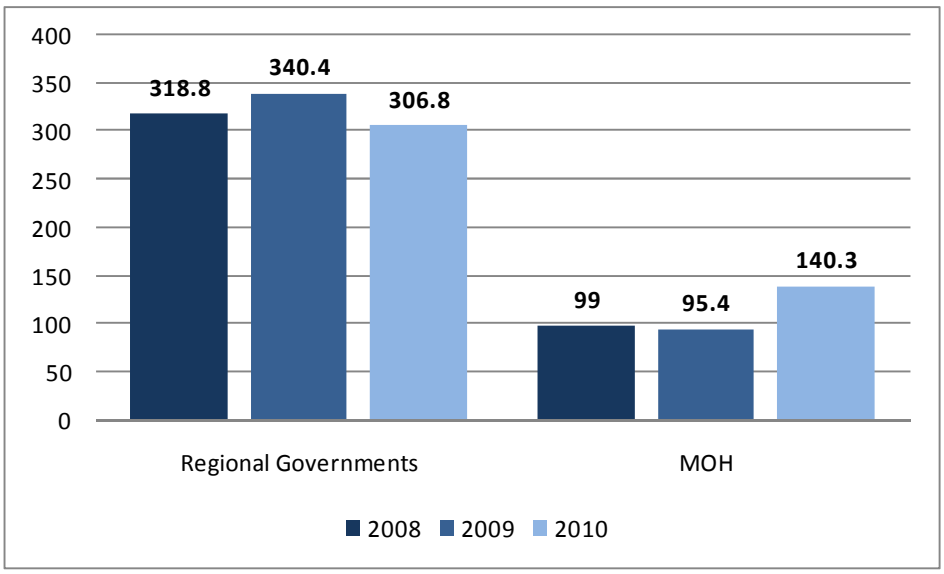
Source: SIAF friendly consultation. Prepared by ANGR Health Technical Committee.
(*) Opening Institutional budget (PIA). In the years leading correspond to the budget execution

Table Nº 2.3: Allocation of resources for investment between the MOH and the regional governments (Million of Nuevos Soles)

	2007	2008	2009	2010	2011 (*)
Lima	63.7	2.6	45.7	190.3	305.9
Other regions	8.7	43.1	96.4	76.6	89.4
Total	72.3	45.6	142.1	266.9	395.3

Source: SIAF friendly consultation. Prepared by ANGR Health Technical Committee.
(*) Opening Institutional budget (PIA). In the years leading correspond to the budget execution

Graph Nº 2.1: Trend of transfers from the SIS to the public health services 2008 - 2010



Source: Management Resolutions. Preparation: ANGR Health Technical Committee

Transfer of functions to local governments

The new Organic Law on Municipalities issued under the current decentralization process, assigns to local governments a series of functions related to sanitation, health conditions and health, which include primary health care management in coordination with regional governments (16). In the context of the above mentioned "*Decentralization shock*" of 2006, the National Government sought to initiate a process whereby health would be decentralized towards local governments pursuant to Supreme Decree 077-2006-PCM. This Supreme Decree provided that decentralization was to begin in January 2007, through pilot projects implemented in all departments of the country and in Callao, while respecting the organization of health networks and micro-networks (13). Subsequently, the MOH determined that primary health care management involved environmental health, the promotion, prevention and provision of the first level of health care, as well as those processes concerned with developing, planning, programming, monitoring, supervising and assessing the service in the first level of health care (17). Likewise, it approved the "*Technical document: Development of the health function in local governments*" (18), defining the process for the development of local health decentralization pilot projects and establishing their phases so as to guarantee technical consistency and the required political agreements. Said document specified that the minimum transfer unit was the health micro-network, eliminating the possibility of transferring isolated health establishments and defining several criteria for the selection of the pilot areas as well as the guidelines for the transfer process.

Initially, MOH identified 16 regions for the implementation of pilot projects at a national level subsequently to the *sensitization and information phase*. The result obtained was limited: only some degree of development was reached in the *design of pilot projects* in the Apurimac, Lambayeque, La Libertad, San Martin and Cajamarca regions, which had received technical assistance from the PCM for the first regions mentioned and external cooperation for the rest of them. Nevertheless, only in Lambayeque and La Libertad, the regulatory arrangements to initiate the implementation *of the pilot project* in the district of Salas in Lambayeque, with the installation and operation of its governing body, were authorized through a regional ordinance. MOH has continued promoting the development of new pilots, despite the very limited results.

2.2.2 Adjustment and institutional strengthening

Through the transfer of sector-specific competencies and functions, the current decentralization process substantially modifies the public management framework at the three established levels of government, forcing these levels to adequate their organizational structure for the exercise of such functions.

Organizational adjustment of regional health governments

Accordingly and in this new context, at a regional level there is the need to establish important organizational changes in regional governments and in their sectoral regional

offices. Hence, some regional governments have initiated organizational adjustment processes both in their executive bodies (headquarters) and in their regional offices. These organizational adjustment processes have sought to base themselves on their own regional reality, more than on a standard model. Thus, a group of regions[1] developed similar reorganization proposals with a territorial approach, incorporating their sectors' regional offices to regional line managements, albeit with heterogeneous and preliminary degrees of implementation. Another group[2] followed a sector-based approach, creating the health regional managements, that were to report directly to their general management. In the case of Junin, its organizational proposal considered a combination of both approaches, incorporating regional health and education managements, due to the scope of their intervention, whereas the other sectors would remain attached as sub-directorates of their regional managements.

As far as the organizational adjustment of Regional Health Offices is concerned, some regions[3] submitted specific proposals for an important organizational redesign; however, only San Martin is implementing this.

Organizational adjustment of the Ministry of Health

At a national level, the framing of the MOH's Organization and Functions Organic Law (LOF) is still pending. Without this document it is not possible to initiate the institutional adjustment and strengthening. Moreover, this situation limits the development of a decentralized management model in the absence of a final definition of the functions at national level.

2.2.3 Leadership and intergovernmental articulation

The process necessarily entails a renewal of relationships among the various government levels towards ensuring good governance, as well as a decentralized intergovernmental management that enables an articulated framing, conduct, implementation and control of public policies. In this context, it is essential to develop actions aiming at achieving consistence and linkage in intergovernmental actions.

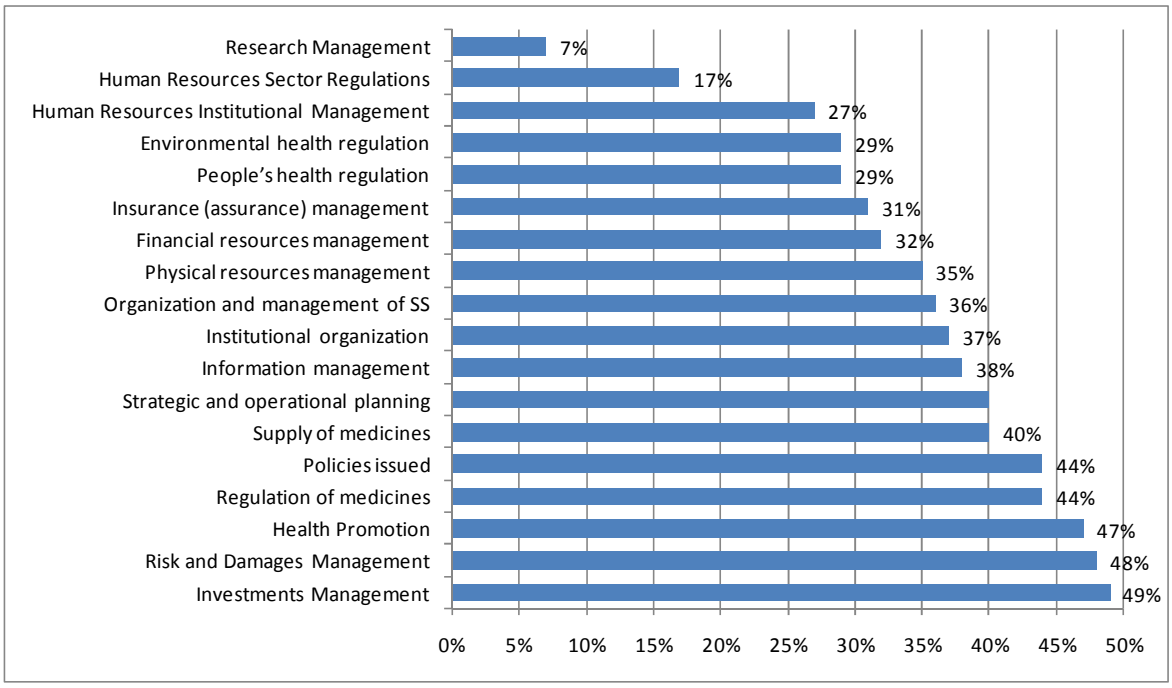
Monitoring of health decentralization

Upon completing the transfer of health functions to regional governments, the MOH accompanied the first decentralization monitoring process in all country regions during years 2008 and 2009, using for this purpose an instrument called Monitoring and assessment of health decentralization (MED Health). Said monitoring is based on a regional self-assessment process, which aim is to identify to what extent the transferred functions are exercised and which overall results may be considered as the baseline. On a complementary basis, these results are important elements in the formulation of plans for institutional strengthening and have been published by the MOH in the document "Systematization of the monitoring implementation process and assessment of health

[1] Huancavelica, Cajamarca and San Martín.
[2] Arequipa and La Libertad.
[3] San Martín, Cajamarca, Lambayeque, La Libertad and Cusco.

decentralization at a regional level". Graph Nº 1 shows the national averages for each management process.

Graph Nº 2.1: National averages of health decentralization monitoring, 2008 – 2009.



Intergovernmental health coordination mechanisms (CIGS)

In 2009, the national government enacted the Annual Transfer Plan (19), under which the MOH established the Intergovernmental Health Committee (CIGS) as an intergovernmental coordination body (20) which had initially been set up by the MOH and the regional governments. Following its installation in February 2011, representatives of the existing local government associations (REMURPE and AMPE) and National Assembly of Regional

Governments (ANGR) were incorporated. The following were established among its main functions: i) development of a shared agenda for the sector, addressing public health and decentralization; ii) coordination of health policies at the national, regional and local levels; iii) monitoring and assessment of the impact of public health policies, plans and programs of national, regional and local scope; iv) development of a decentralized management. To facilitate its operation it was decided to set up a technical Secretariat as well as thematic, territorial or other working groups, to discuss specific subjects with the participation of specialists from the MOH and from regional and local governments.

Thus far, the Committee has been meeting regularly, developing coordinated actions primarily in health financing and insurance issues (review and adjustment of regulations for the payment of health care services by the SIS to regional governments) and in problem areas associated to human resources for health (National Capacity Building Plan). Recently, an assessment of its organization and functions was conducted and its Executive Secretariat was set up as its governing body, with duties shared by the three government levels. Additionally, its work plan for 2011 was approved.

Other opportunities for intergovernmental coordination on health matters

The Program of Incentives to an Improved Municipal Management, established by Law N° 29332 (21), provides an opportunity to boost the development of coordinated health actions between regional and local governments within their jurisdictions, to the extent that it is advisable for municipalities to coordinate with their regional governments before they may attain the targets and secure the allowances established for municipalities. The targets associated to health interventions are children's growth and development control, which is conducted at health public services reporting to regional governments. These constraints encouraged coordination between both government levels in some regions. It is worth noting that in April, the MEF issued Urgency Decree N° 012-2011 affecting, among other aspects, the schedule for the allocation of resources set out in the Municipal Incentives Plan, postponing it until September. On the other hand, some local governments scheduled one portion of their ordinary economic resources in the budget chains associated with the Nutritional Articulated Program authorized by the MEF for the current fiscal year.

2.2.4 Democratization of health public management

The health sector issued a Law for citizens participation in health management focused on the shared management program (CLAS) (22). Notwithstanding, this law has limitations as far as accountability and transparency in governmental management. A significant number of regional governments have developed participatory processes for the formulation of regional health plans and policies, organizing in some cases citizen consultations for the identification of health priorities. Nonetheless, in most cases, there have been significant constraints for their implementation.

2.2.5 Pending decentralization Agenda

National Scope Agenda

- Renew the social and political commitment towards decentralization based on prior covenants and agreements, involving political players and national, regional and local technicians.
- Complete the definition of competencies and allocation of functions among the various government levels.
- Adjust the public management systems and procedures.
- Advance the fiscal decentralization.
- Redesign the regions creation process and develop partnership mechanisms among government units.

Health Sector's Agenda at national level

- Transfer of functions to Metropolitan Lima.
- Carry out the regulatory (LGS and others) and institutional arrangements to facilitate the exercise of functions transferred to regional governments.
- Formulate a new organic law for the MOH within the framework of the Organic Law of the Executive Power, and the adjustment of its organization for the exercise of national functions.
- Strengthen the MOH's regulatory role.
- Reinforce the intergovernmental articulation for the drafting of national sector-specific policies, guarantee their implementation and provide follow-up and evaluation.

Health Sector's Agenda at a regional level

- Adjust the organization of the Regional Health Directorate (DIRESA) as part of the redesign of the Regional Government. Strengthen the Social Development Management for an effective multi-sector, social action.
- Build up regional institutional capacities for the exercise of the transferred functions.

Health Sector's Agenda at a municipal level

- Review the local health decentralization model based on the capacities of the various types of municipalities.
- Define the local management model to include the participation of local governments in network and micronetwork management.

3. The situation of malaria in Peru

3.1 Epidemiological situation of malaria

Malaria exists in Peru, probably since before the Spanish conquest. Historical facts show that the indians used the bark of the quina tree to treat malaria. There are references between 1800 and 1900 about malaria epidemics (called tertian due to the type of fever), along the Peruvian coast, in some valleys and in the jungle.(23, 24).

The organized fight against malaria began in 1941 with the National Service against malaria. In 1941, this service recorded 56.778 cases of malaria which corresponds to an incidence rate of 1.960 cases per 100.000 inhabitants (25). During the forties, the main cause of morbidity in the country was malaria.

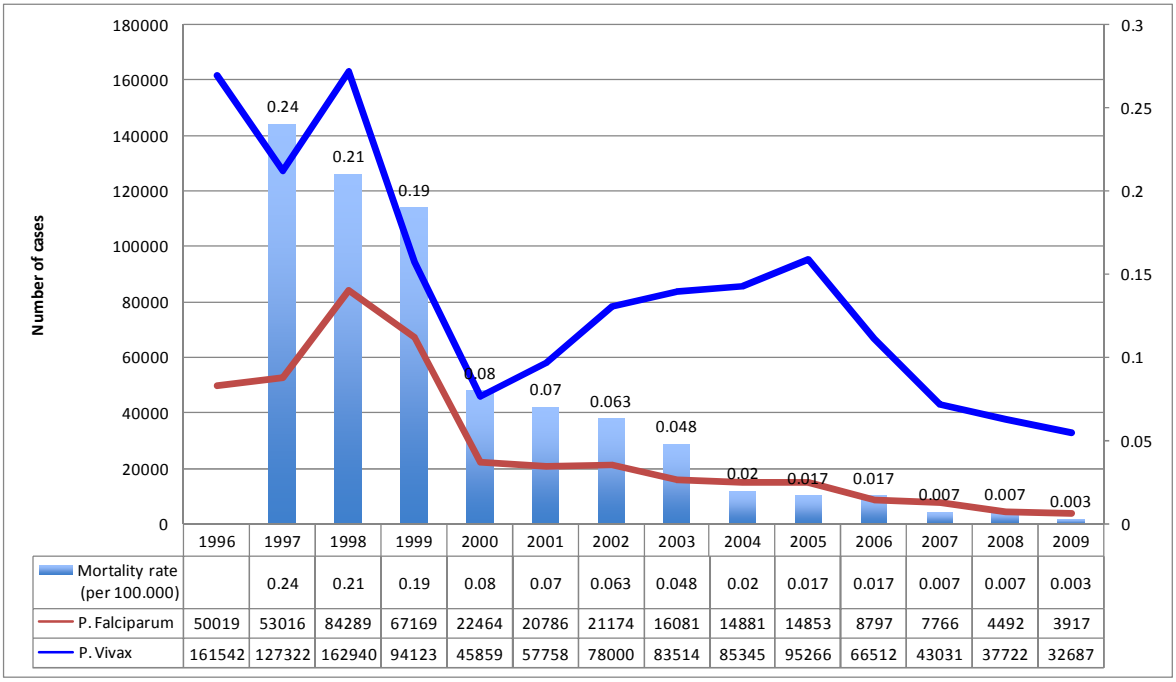
Since 1946, the insecticide DDT was used to reduce the density of the Anopheles and thus achieve a sustained reduction of malaria (25).

In 1957, malaria was found in 75% of the national territory, affecting 30% of the population, mostly in rural areas (26). The incidence of malaria was 308 cases per 100 thousand inhabitants, with the presence of *Plasmodium falciparum*, *P. vivax* and *Plasmodium malariae* in the three regions of Peru. It was also identified that the main vectors for transmission in the coast were *Anopheles albimanus* and *Anopheles pseudopunctipennis*, in the valleys and the jungle they were *Anopheles benarrochi*, *Anopheles oswaldoi* and *Anopheles darlingi*.

In 1968, the land areas affected by malaria were reduced in 86% of the country (180.000 km2) and the exposed population was established at 1% of the total population (97% reduction compared to 1957) (27). In the sixties, malaria was almost eradicated in Peru. In the following decade, however, due to lack of resources, the number of cases increased and malaria became, once again, one of the main causes of morbidity in the country (28). Since 1969, the rise in the incidence, mainly in the coast, was favored in some cases by weather conditions (such as the El Niño phenomenon in 1983, especially in the northern coast) and migration, often associated with drug trafficking and terrorism (27).

Since 1992, the endemic area in Peru represented 75 per cent of the territory and the population exposed to this illness was 34 percent of the country, with similar figures to those of the fifties (29). In 1991, the number of *P. falciparum* cases represented less than 1 percent of all cases (26), and in 1993 it was above 10 percent of the total cases recorded.

Fig. 3.1. Peru: cases of infection by *Plasmodium falciparum*, cases of infection by P. vivax, and mortality rate from malaria. Period 1996-2009



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mortality rate (per 100.000)		0.24	0.21	0.19	0.08	0.07	0.063	0.048	0.02	0.017	0.017	0.007	0.007	0.003
P. Falciparum	50019	53016	84289	67169	22464	20786	21174	16081	14881	14853	8797	7766	4492	3917
P. Vivax	161542	127322	162940	94123	45859	57758	78000	83514	85345	95266	66512	43031	37722	32687

Source: Ministry of Health

Figure 3.1 shows that the number of infections due to *P. falciparum* was significantly reduced from 84,000 cases in 1998 to 3,917 cases in 2009 (95% reduction). The incidence of *P. vivax* was also reduced from 162,000 cases in 1998 to 32,687 in 2009 (80% reduction).

In 2010, 29,201 cumulative malaria cases were reported in the country (incidence of 0.99 per 1,000 inhab.). 26.847 (91,94%) out of the total cases correspond to infection by *Plasmodium vivax* (incidence of 0.91 per 1,000 inhab.) (30).The cases of malaria by *P. falciparum* originate from Loreto (with an incidence of 0,08 per 1,000 inhab.). In the same year, there was one death due to *P. falciparum* in Loreto (30).

91,4 per cent out of the total cases of malaria in Peru originate from the regions of Junin, Madre de Dios, Loreto, Piura, Tumbes, Cuzco and Ayacucho. In Loreto, 11,454 cases of malaria, which represents 39.2 percent of countrywide malaria cases (30).

3.2 National response to malaria and decentralization

Between 1907 and 1940, the Peruvian government drafted the legislation to recognize some malaria zones and to create a progam for the eradication of malaria. Back then, control of malaria had as its main strategy environmental management, eradication of breeding grounds, elimination of mosquito larvae, protection against mosquitoes during the evening and night

hours, and the therapeutic protection of people, with the free distribution of quinine in transmission areas. From 1937 to 1941, a Technical Department for malaria was created, which was in charge of prevention and patient treatment measures (31).

In 1941, the Malaria National Service was created and in 1957, due to the large area covered by malaria and the high incidence of this disease in the country, the National Service for the Eradication of Malaria (SNEM) was created (26). The SNEM financial resources were allocated both by the Peruvian government and by international agencies (this amount reached US$ 15 million until 1964). SNEM operated as a vertical national program, which used DDT as the most important action to eradicate the vector (27).

SNEM strategically divided its action into four phases (28): a) a preparation phase, which consisted in a reconnaissance of affected areas, geographical features, epidemiological studies; b) attack phase, consisting in the spraying of insecticides, persistent action and epidemiological evaluation to assess results; c) consolidation and epidemiological surveillance phase, when infection sources have been exhausted; d) Maintenance phase, where after three years counted as from the previous phase, surveillance was approved under the responsibility of the public health services, awaiting the outbreak of new cases.

In 1962, the Public Health Special Service, attached to the Ministry of Health, was created. In 1964, the SNEM was entrusted to this entity. Since the inception of the SNEM operations, the incidence of malaria was gradually and significantly reduced. In 1968, the transmission of malaria was successfully interrupted in a great portion of the coast, interandean valley and jungle of the country (31). Until 1964, SNEM had well trained technical personnel.

In 1969, the National Program for the Eradication of Malaria (PEM) was created, based on the SNEM National Eradication of Malaria. In that year, the PEM had a shortage of resources and the incidence of malaria began to rise, primarily in the coast (31).

In 1993, an assessment of the PEM was made and it evidenced administrative problems and serious technical and financial infrastructure limitations. The main findings were: insufficient budgets, low salaries for workers, reduction of the UNICEF financial cooperation, lack of vehicles and insecticides, restricted mass medication, presence of DDT resistance, and presence of *falciparum* resistance to chloroquinine (31).

The results of the assessment led to deconcentrate the control of malaria during the period from 1974 to 1990. In 1974, the operations against malaria were integrated into comprehensive care programs for health regions (31).

The deconcentration of malaria control activities represented a complex allocation of responsibilities to the local health authorities, with no additional human resources, materials and technologies for such responsibilities. Just a few human resources and materials were transferred from the weakened PNEM (31). Since the decentralization of the PNEM, the operations against malaria were grouped into a functional program for the control of malaria and other metaxenic diseases, with no specific budget (31).

Malaria cases increased even further during the period of economic crisis in the 80's, when control operations in areas declared as emergency zones were suspended as a result of the drug trafficking or terrorism activities conducted in malaria areas, and the growing flow of people

between endemic and transmission-free areas. In those places, the epìdemiological surveillance was partial and the number of houses sprayed with insecticides was reduced (31).

The economic crisis continued in 1987 and 1992, and public spending on health was abruptly reduced in a context of severe downturn in the family income which triggered the re-emergence of diseases that had disappeared, such as the cholera epidemic of 1991. As far as malaria, more cases of this disease and the propagation of *P. falciparum* were reported (31).

In 1992, the control of malaria in Peru was modified based on the new world strategy to fight malaria, changing the management of the environment and the vector for a focus on people and their risk behaviors. This strategy emphasized the curative care for malaria, improved access to early diagnosis, timely and efficient treatment as the key strategic elements to reduce morbidity and mortality caused by malaria (31,32).

In 1999, the National Health Institute contributed evidences of the presence of resistance by the *P. falciparum* to anti-malarial drugs. It reported that in the Amazone there was more than 30% resistance to chloroquine and more than 60% resistance to sulfadoxine-pyrimethamine. Accordingly, the Ministry of Health changed the disease treatment scheme in Loreto to quinine-clindamycin (33, 34). The change was not implemented in all services on account of side effects in the administration of quinine and the longer duration of the treatment plan (7 days) which resulted in high treatment drop out rates (32).

In 1999, following an assessment of the combination therapy, the Ministry of Health through the Program for the Control of Malaria and Other Metaxenic Diseases (PCMOEM) updated the National Regulation for the Prevention and Control of Malaria in Peru, introducing a new national drug policy for new antimalarial drugs (35). The new antimalarial drugs were included in the Malaria Control Operating Plan, 2000-2001. A surveillance system on the resistance to antimalarial drugs was introduced in 2001 (32).

In 2004, the Ministry of Health created the National Health Strategy (ESN) for the Prevention and Control of Metaxenic and Other Vector-Borne Diseases, consisting of a Permanent Technical Committee made up of the line management offices of the Ministry of Health and an Advisory Committee made up of members of scientific societies, international cooperation, NGOs and academic institutions. The ESN is responsible for the technical regulation for the prevention and control of metaxenic diseases, including malaria.

The ESN develops its activities in the following components: i) articulation with the community, civil society and local governments for the prevention and control of malaria; ii) identification of cases and of the effective and timely treatment (antimalarial drugs are strategic public health medicines, which only access is through public sector establishments); iii) epidemiological surveillance of malaria, this illness is reported compulsorily; iv) the use of protection barriers in households (ESN provides free of charge or subsidized the distribution of insecticide-treated mosquito nets to all members of the priority community); v) awareness-raising and education of the community on vector-transmission preventive measures (consisting in the application of residual insecticides at intervals and space applications for the control of adult mosquitoes, as well as the use of larvacide in mosquito breeding sites), vii) development of skills in health workers at all levels.

The reduction of malaria cases since 2004 coincides with the implementation of comprehensive interventions (use of artemisinine-based combination therapies, communication campaigns for

behavioral change, distibution of insecticide-treated mosquito nets, etc.) with the financial support of international cooperation agencies (USAID, World Fund through the Project Global Fund PAMAFRO).

Peru, together with Ecuador, Colombia and Venezuela, developed a project for the “Control of Malaria in the border areas of the Andean Region: A community aproach” – PAMAFRO which was financed by the Global Fund. The project ran from 2005 to 2010 with US$ 25 million. The aim of this project was to reduce the malaria incidence and mortality in the border areas of these countries, through community participation, strengthening of the civil society organizations, and an increased access to the diagnosis and treatment of malaria (36).

The malaria prevention and control management model was designed prior to decentralization and has not been adjusted to the new scenario. Currently, there are challenges posed to the ESN governance and operation because there are too many players acting in a disjointed manner; which now include regions and municipalities. Accordingly, there is a duplication of efforts, an absence of leadership, a non-use of effective interventions, programming errors, reduced intensity in the surveillance, prevention and control of vectors, lack of a timely allocation of resources to handle outbreaks and for the routine operation of the program.

ESN does not have a mechanism for negotiating or enforcing compliance with the targets or for the performance of surveillance and control activities at the regions, and has limited resources available to conduct an intergovernmental and supervisory governance. At the regions and at national level, ESN coordinators are functional positions; this situation constrains their capacity for the allocation of resources and the implementation of the budget.

It has been estimated that, in 1998, the total cost of malaria in Peru was US$ 40 million. Disaggregated, the total cost for the Ministry of Health was US$ 9,8 million, which represents 24% of the overall country cost. Most national expenses, however, originate from families, for whom the cost of malaria amounted to US$ 28 million, 71% of the total (37).

Since 2011, the activities for the control of the disease were included in the Results-Based Budget Program of the Ministry of Economy and Finance. This will enable regions to allocate resources in a specific and protected manner for the prevention and control of malaria. Formerly, the resources for the prevention and control of malaria came from the overall budget for the Region; consequently, they were not always used for this purpose.

In 2011, the Ministry of Economy and Finance transferred US$17,3 million to the Ministry of Health and the regions to reduce the morbidity and mortality from metaxenic illneses and zoonoses (38).

For 2012, US$ 252.2 million have been allocated to the Health Sector, which shall be transferred to Regional Governments for the Results-Based Budget Programs: Articulated Nutritional Program, Maternal and Neo-natal Health, Prevention and Control of TBC and HIV-AIDS, Metaxenic Illnesses and Zoonoses, and Non Transmissible Illnesses (39).

4. Decentralization and public health programs

There are reports that study how forms and processes of decentralization affect public health programs. They particularly study the health consequences of passing from vertical programs for the control of transmissible diseases to more horizontal programs integrated into decentralized health programs (40, 41, 42).

Thus, it has been reported that decentralization processes for the prevention and control of transmissible diseases have been heterogenous in different countries. The reports on the results of decentralization experiences in the control of transmissible diseases have been reviewed within this framework, in accordance with the institutional and material contexts in which there were prepared, to identify the factors that led to obtain better or worse results in different countries (40).

The effect of decentralization on public health and particularly on the prevention and control of malaria will be briefly reviewed below.

4.1 What does health sector decentralization involve and what is expected to be achieved?

Health sector reforms are generally expected to improve the equity, efficiency, quality and financial viability of the health system (43). In the 80s and 90s and up to the present, decentralization has been one of the most promoted strategies for redirecting health services within the framework of reform processes.

The decentralization of national health care systems was a reform proposal that reached worldwide popularity in the 1990s. It was thought that health care systems would improve if local officers exerted more control over them. Thus, several decentralization models were implemented in developing countries from Latin America, Africa and Asia, with variable results (44).

In some Latin American countries, the health sector decentralization is part of a broader reform of this sector and the modernization of the government. It promotes institutional and territorial decentralization as a means to ensure levels of competence across the public sector and create cost control awareness, as well as to develop a new role for the government (45,46). Almost all Latin American countries have adopted the decentralization of the government or some public services, such as health and education (47).

Decentralization implies readjusting the relations between government and society, expressed as the transfer of competencies from an entity with a national jurisdiction to another sub-national jurisdiction. Decentralization is part of the government's democratization process and redefines the forms of representation and participation of the population (48).

In a decentralization process, the central government transfers political power, resources, decision making and administration to organizations such as local agencies, subordinate governmental units, semiautonomous public corporations, local governments or community-based organizations (49, 51). Consequently, it is necessary to strengthen the institutional

development of sub-national levels and community participation mechanisms. Institutional development implies creating and strengthening the capacity of sub-national institutions or organizations to generate, allocate and use human and financial resources in an efficient and effective manner, to achieve public objectives (52). Community participation is a process whereby the community engages in the planning, execution, evaluation and decision regarding public problems that affect individuals and the community (54, 55).

Reportedly, decentralization is a field of conflicting interests which involve specific social players. Each one of them has concrete practices that shape, accelerate or hold back the process. Consequently, it is a highly heterogeneous process that may lead to results which are not always desired (48).

Government decentralization expresses the abandonment of an organization that centralizes for the handling of conflicts and interests. The decentralized organization of political systems, public finance, administration and provision of basic services to the population is the result of the struggle among strategies with a multiplicity of economic, political and social players (48).

Two key questions must be answered for decentralizing a health system: Who has the decision making power? and How much power does they have over what functions? Decentralization models and strategies may be very diverse. Power may be transferred to the provincial, municipal or unit level. This includes decisions on human resources and provision of services, and the coordination between sub-national governments (56). There are new laws and regulations that define the structures of authority of the health system for the implementation of a decentralization process.(57).

Decentralization theories predict this policy implies benefits and disadvantages (58). The most justifiable reason for decentralization is the fact that services are more effective when they serve groups with relatively homogenous tastes. Besides, the collection and processing of information from smaller areas or organizations implies lower costs. It is assumed that local authorities will have a greater responsibility before the public for the decisions they make (57).

In a decentralized system, the central government generally associates the figure of the Minister of Health to the assessment of goals and parameters for health programs and policies. Through the diverse, above described forms of decentralization, the central government transfers authority and resources to local agents –municipal and regional governments, decentralized bureaus or autonomous institutions- so that they may implement their objectives.

The decentralization of national public health programs particularly establishes an “agent-principal” relationship, in which central and local governments have at least partially different objectives. Agents often have different preferences regarding the combination of activities and expenses to be carried out, and respond to a different group of stakeholders and audiences, compared to principals at a national level (60).

Then, sub-national institutions may have incentives to evade the orders established by the central government. Moreover, since agents have a better information about their own activities

than the principal, they have the possibility of "evading" responsibilities defined by the central government and focus on their own programs. The cost to overcome this asymmetry of information is extremely high for the principal. Within this context, the central government seeks to attain its objectives through incentives and sanctions that effectively guide the agent's behavior without generating unacceptable losses in terms of efficiency and innovation. Various mechanisms are used for this purpose, including monitoring, reports, inspections performance reports, contracts, concessions, etc.(60)

Decentralization may be regarded as a process to expand the decision making field or range of alternatives for sub-national agents, within several political, administrative, financial and governmental spheres (61). The central principal voluntarily transfers the formal authority to the agent, to promote its health policy objectives. The extent and nature of this transfer differ on a case by case basis and define the function of the agent-principal relationship and the decentralized system as a whole (60).

The central government has other control channels available to define or act upon sub-national decisions. The central government may give incentives to those who make decisions at local level, so the decisions they make favor national priorities. These incentives may include shared financing, in which the national government delivers funds for a priority activity if the sub-national government delivers a similar amount of resources and implements the activity. Incentives may also include guidelines or other forms of technical assistance to improve local capacities and influence local decisions. They may also include capacity building training in areas that strengthen central priorities, and mechanisms for a special recognition of compliance with goals in priority areas, such as competitions for the highest immunization rates among regions (60).

However, decentralization involves several challenges. For instance, decentralized units have to be big enough to capture certain economies of scale. Decentralization may also be inequitable, because it is difficult to redistribute among communities. Finally, transferring fiscal resources to sub-national levels may create more opportunities for corruption (59).

Another important factor of decentralization is the context in which it is developed. For instance, decentralization has been used to hide the continued presence of a centralized administration. There are also cases in which functions or resources have been delegated to lower levels of government without establishing a system to support, coordinate and regulate their actions (59).

4.2 Effects of decentralization on the control of malaria

Malaria is the most important metaxenic disease worldwide by the number of affected countries, and the number of people who catch the disease and die each year (63, 64). Eradication strategies have been worked out in the past decades through vertical programs; these strategies are being reviewed (65, 66).

The processes for implementing decentralization are gradual and are immersed in a series of reforms that sometimes go beyond the health sector, and may disguise the real effect of decentralization, such as housing, sanitation and educational programs, and changes in population dynamics, among others. In spite of this, there are lessons learned that may be taken into account to improve the control of malaria in the context of health system decentralization.

For instance, in 1966, **Philippines** adopted a vertical control program for malaria, which was decentralized 17 years later. Eradication efforts stopped and the situation reverted to a control program. An assessment of this new program in 1993 proved that it was well developed at infrastructure level, but it had a main administrative-bureaucratic problem and for this reason, it was described as a semi-vertical program. In 1991, the government enacted a law to transfer health services to the municipalities; however, after ten years, no guidelines had been issued to establish the responsibilities of municipalities regarding the control of diseases, including malaria. This fact caused the lack of financing for the malaria control program, because local authorities assumed it was still under the responsibility of the central level, and the central level asserted this was a decentralized function. Moreover, the information on the control of malaria did not contribute to local planning, so local financial resources were not used to control malaria (67).

Colombia enacted three laws to decentralize the health sector: Law 10 of 1990 that grants autonomy to the municipalities for handling resources and providing the first level of health care services; Law 60 of 1993, that specifies municipal responsibilities regarding health care and defines the rules of the game for financing, allocating competencies and resources; and Law 100 of 1993, that creates the General Social Security Health Care System. The Colombian decentralization model has a devolved method because sectoral functions and resources have been transferred to local governments that undertake the responsibility of providing services, administration and finance, but the central government determines health goals and policies.

Malaria was controlled since 1957 through a vertical program called Malaria Eradication Service, then it was in charge of the Special Administrative Unit of Direct Campaigns, technically and administratively managed by the Ministry of Health. In 1994, vector control responsibilities were transferred to the departments, and malaria diagnosis and treatment were transferred to the municipalities. However, municipalities had to be certified to perform this function. Only 19 of them obtained certification in 1994, and 538 out of 1097 municipalities did this in 2000 (68).

The Colombian health system reform was implemented from 1991 to 2004. It included the decentralization of health services to the municipalities (1991-1993); and the implementation of the General Social Security Health Care System (SGSS) (1995-2004), characterized by a regulated competency model subject to market principles. Thus, vector control was in charge of the municipalities and the handling of malaria cases was in charge of insurance companies (68). Thus, the passive capture of cases, thick blood smear test and treatment were paid by uninsured parties or insurance companies. While it is true that the decentralization of health systems expanded health care coverage, it improved user satisfaction, and increased expenses and health workforce at local level, however, the control of malaria did not improve, and it was even reported that malaria cases caused by *P. falciparum* increased in comparison with the time when the vertical program was in force (70). With decentralization, the government lost the responsibility over public health and the control program was fragmented, and it was not possible to integrate information systems; the number of human resources devoted to controlling malaria decreased; health care coverage, training in thick blood smear test, vector control and clinical care of cases, and financing were reduced; and logistics problems arose (71). Municipalities report that the relationship with the departments is conflictive and that they are not allocated sufficient resources (72).

In **Brazil**, the decentralization process occurred at a time of institutional crisis at state level with a low capacity for implementation and inter-sectoral governance. Malaria was a Public Health priority in the country. A Plan for Intensifying Malaria Control Actions in the Legal Amazon Area (PIACM) was developed within the Universal Health Care Insurance. The PIACM prioritized 254 municipalities in the Amazon Area, which had a proportion of malaria caused by *P. falciparum* higher than 20% of the cases and with urban transmission. The certification of the municipalities proposed by the Federal (Central) Government was a very quick process that led to an initial disorder that hindered its implementation. In 2001, all municipalities had been certified. Regardless of the type of municipality, the main difficulties included financial resources primarily for field actions and human resources competent for planning, managing and evaluating control actions. Nevertheless, as far as training is concerned, it is perceived that human and financial resources, and the strategic actions implemented are deemed sufficient. Despite the scarce economic resources and other type of serious difficulties in the decentralization process, municipalities make innovations and seek financing alternatives to organize health services at local level in a more efficient manner (73).

The PIACM involved an increase in the workforce, an expansion of the training processes and an increase in infrastructure for diagnosing and treating malaria, and a higher capacity of means of transportation and equipment for sprinkling insecticides (74). It also improved the information systems of municipal health secretariats. This allowed a better recording of cases and activities, and there was a constant supervision at all levels during the implementation of this plan. These actions evidenced a general decrease in the number of malaria cases (76,75), the incidence was reduced by 53.9% on average. The hospitalization rate was decreased from 2 admissions per 1000 inhabitants per year in 1999 to 0.8 admissions per 1000 inhabitants in 2002. Malaria mortality rate decreased by 64.3%, going from 1.9 deaths per 100,000 inhabitants in 1999 to 0.7 per 100,000 inhabitants in 2002. Malaria lethality rates decreased from 0.03 per 100 cases in 1999 to 0.02 deaths per 100 cases in 2002. Thus, it may be inferred that the PIACM contributed to the decrease in the transmission of malaria in small and medium size municipalities, although the concentration of cases persists in larger municipalities (74).

In 1990, **Uganda** changed the form of financing the health care system, from a free system to a shared payment system. The decentralization of the health care system was implemented in 1993 and in 2001, the government again reverted to free health care services. In Uganda, malaria accounted for between 29 and 50% of early deaths and 20% of hospital admissions. Reportedly, the decentralization could not improve the control of malaria if it was not accompanied with an appropriate budgetary allocation. Resource allocation systems from the central level maintained high levels of red tape, which posed a difficulty in implementing expenses and, consequently, affected the control of malaria. In addition, a lack of financing for control programs led to a decrease in health care staff and a shortage of medications (76).

Consequently, it may be concluded that decentralization processes and their implementation circumstantially affected malaria programs as a result of the modifications in financial flows, changes in responsible and operational personnel, and in information and surveillance systems. However, most of these problems, albeit serious as it happened in Colombia, were resolved within short periods of time (77).

Processes of decentralization towards the provinces, states, regions or municipalities are sometimes considered beneficial in the long run in countries that are progressing in the decentralizing process, because those already decentralized programs continue to be

strengthened. To others, decentralization leads to a loss of governance in public health programs, particularly for malaria.

Although they have been decentralized in some countries, malaria programs continue behaving as centralized programs, financed from the national level (the weight of tradition), as they are not integrated to local health care plans and, therefore, do not benefit from the essential advantage of decentralization. Technical assistance is an essential factor of decentralization, as well as the political commitment to the decentralizing process (77).

The economic and financial crisis the countries go through have serious effects on malaria programs, regarding the reduction of budgets, delay in budgetary availability and acquisition of supplies (77).

5. Proposal for designing a decentralized management for the malaria control

Peru has traditionally planned, financed, managed and controlled health priorities through vertical programs, and has installed a nationwide operational network that financially and technically depends on the Ministry of Health. These programs have usually worked with dedicated funds, their own nationwide operational network and an autonomous information system.

Following the completion of the process for transferring essential sectoral functions (including health care) from the national government to the regional governments, the latter have acquired powers to develop their processes for planning, managing and controlling their interventions in health care. The most widely applied nationwide tendency has been fostering comprehensive schemes to manage health care. This has created a tension between a centralized scheme of management for health priorities through vertical programs and its coexistence with the implementation of a more integrated horizontal scheme of approach.

The decentralization process has created new spaces for decision making at political, administrative and operational levels, that force to review the operation of the centralized management of vertical programs, taking into account that the transfer of essential functions to the regional governments has not involved the formulation of any adjustments to the current management model that are suited to the new context.

The design of the inter-governmental management model for the prevention and control of malaria demands a clear definition of functions, institutional arrangements, and mechanisms for inter-governmental and inter-sectoral relationships, not only in the operational and technical plane, but also in the management and financing of the operation of preventive and control measures. It also requires adjusting the technical documents, standards and strategies, because malaria preventive and control measures are globally designed for the country, and not take into account the geographical, socio-economic and cultural, and organizational differences, and the health care system constraints existing in each region.

The proposal for designing a decentralized model for managing malaria is based on the experience of USAID/Políticas en Salud, which is currently developed to implement a decentralized model to manage a health priority, such as chronic malnutrition in children. This management model is being developed at the request of the San Martín Regional Government (Box 1).

The methodology used in San Martín has a bottom-up approach, i.e., the scheme of a decentralized management for a health priority starts with the operation and delivery of services. Thus, the effective interventions or the nature of the services delivered to the users are defined first, and then comes the study of the manner in which key services are delivered, and the identification of the constraints or problems that hinder an effective, efficient, and timely provision of a good quality service. The causes of the restrictions are analyzed and proposals for eliminating or reducing the restrictions within the framework of regional institutional strengthening and decentralization of the health sector are developed. Adjustments and

mechanisms to improve the operation, management and inter-governmental and inter-sectoral relationships are finally proposed.

This methodology coincides with the considerations necessary for the effectiveness of child survival programs. These programs have proven that it is necessary to take into account health system restrictions in order to expand the coverage of effective interventions. Because, although there is enough evidence about the interventions required to reduce mortality and malnutrition in children, their implementation in low-income areas continues to be a challenge. Evaluations have demonstrated that these effective interventions do not reach all those that need them, particularly the poorest (78, 79, 80). These evaluations have found that programs intended to offer these interventions are often irregular, low quality, inequitable and short-lived. Víctora et col (2004) (81) deducted that this situation is partially explained by the limitations and deficiencies in health systems and because little attention has been paid to the inter-sectoral implementation of these interventions, generally because financial and technical resources are insufficient and because the offer (supply) of services is almost non-existent in the poorest areas.

Box 1. Decentralized management of the Program for Reducing Chronic Malnutrition in Children

The priority axis for the administration of the San Martín Regional Government is to reduce chronic malnutrition in children under 5 years of age. For this purpose, it has decided to implement an effective program that allows an important reduction of this damage by the end of the 2011-2014 term.

To this end, the regional government authorities requested the technical assistance of the USAID/PERU/Políticas en Salud Project. The project proposed to sustain the program on effective interventions that have been rigorously evaluated and whose impact may be measured in terms of a reduction in malnutrition.

A first exercise carried out between the USAID/PERU/Políticas en Salud Project and the regional authorities and specialists allowed identifying the effective interventions and basal coverage of these interventions in San Martín. The analysis included different types of interventions, as well as educational and promotional activities to improve nutrition, interventions with micronutrients, and muti-sectoral preventive interventions. By increasing the coverage of effective interventions until 2014, it could be possible to reduce chronic malnutrition in the region by 10 percent. This will require a considerable effort from the regional government in terms of financing and management.

The basal coverage in the San Martín region has been identified and goals have been set to increase this coverage for each one of these effective interventions, with an aim to reduce chronic malnutrition in children under 5 years of age by the end of the regional government term.

The definition of roles and functions, the control of information, control of administrative systems and, finally, the financing and organization of health care services are elements that must be reviewed to establish the critical processes and the responsibility of their nationwide and region-wide execution.

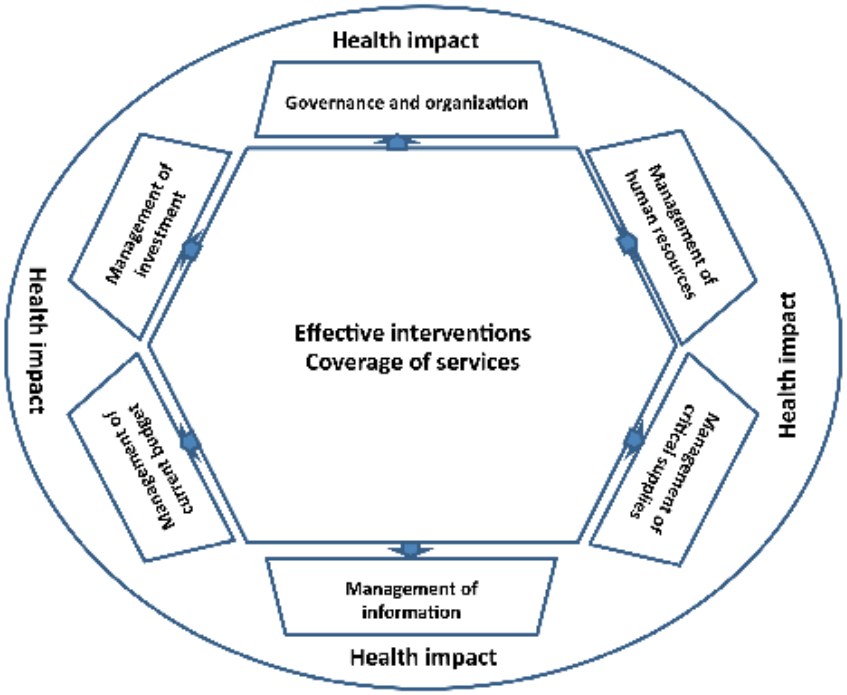


Fig. 5.1. Decentralized management model to implement effective interventions and expand coverage of services for health priorities

The decentralized management requires to know what is the restriction and the extent to which this restriction may be eliminated or reduced (Fig. 5.1). The restrictions of a regional government to implement an effective intervention or expand the coverage of services may be grouped into: i) management and organization; ii) management of human resources; iii) management of critical supplies; iv) management of information; v) management of current budget; vi) management of investment. The knowledge of the limitations faced by the regions is essential to estimate the resources necessary to expand the coverage of effective interventions and strategic decision making about the forms of delivery, sequence of actions and level of expansion of the services. The decentralized management will require the strengthening of health care systems and the provision of more resources to the health sector, taking into account the restrictions typical of each region.

The design of the decentralized management model of health priorities is carried out by answering the following questions: What must be done? Where to do it? What is the target population? What is the cost of the intervention and additional budget? How does the increase in the coverage of effective interventions affect the population? How to improve the organization and provision of services to expand the coverage of effective interventions and services?

The design answers these questions by following the steps listed below:

Stage 1. Identify the effective interventions and key services

This stage starts with a systematic review of the effective interventions and the identification of the services for the health priority (See example in Box 2). This review will be in charge of experts in this matter and members of the regional technical team.

A technical meeting is then held with the regional government authorities, the DIRESA and the bureaus related to the health priority, to present the evidences about the effective interventions and key services for the health priority, discuss the viability and possible goals for expanding the coverage of effective interventions and services. The work plan for the design of the decentralized management model for the health priority is developed at this stage.

Box 2. Effective interventions of the Program for Reducing Chronic Malnutrition in Children in the San Martín Region

Fourteen effective interventions based on scientific evidence were selected on the basis of the evidences (82), which were grouped into: a) strategies to improve the intake of nutrients and micronutrients (nutritional counseling together with the delivery of food and micronutrients); b) strategies to prevent diseases (installation of water and sewerage systems, promotion of hand washing with soap, hygienic disposal of children's faeces, vaccination, family planning, prenatal care, newborn care, post-partum care), c) strategies for handling diseases (quality heath services for treating: diarrhea with zinc, pneumonia with antibiotics, dysentery with antibiotics, and providing calories and protein supplements to pregnant women with malnutrition).

Evidences about effective interventions on malaria

There are three main strategies for preventing malaria that have effective interventions based on evidences (83): a) reduce the mosquito population, b) reduce human-vector contact, and c) the supply of medicines.

The effective interventions to reduce the mosquito population consist of modifying or altering the environment to deprive the Anopheles from its survival requirements. These interventions may reduce the incidence of malaria between 80-88%, although it is necessary to conduct randomized experimental research (weak evidence).

The interventions that reduce man-vector contact that have proven to be effective are long-lasting insecticide-treated mosquito nets and intra-domiciliary spraying with residual insecticides, because they reduce Anopheles bites in humans.

It has been proven that mosquito nets reduce child mortality by 17-23% (very strong evidence) and reduce the incidence of malaria by 45% (weak evidence). Insecticide-treated mosquito nets reduce anemia and parasitemia during pregnancy and reduce low birth weight by 10-30% (very strong evidence).

Residual spraying with long-lasting chemicals must cover walls and roofs inside the house and at places where domestic animals are bred, to eliminate adult vectors. Intra-domiciliary spraying with insecticides reduces the incidence by 14-54% (moderate evidence). Apparently, it improves the effectiveness in environments with a lower rate of mosquito bites per year. The use of mosquito nets seems to be more effective than intra-domiciliary spraying with insecticides (18-32% reduction of the incidence, weak evidence).

The use of antipaludic drugs offers a good protection for high risk groups. Treatment schemes during pregnancy (intermittent preventive treatment during pregnancy) reduce perinatal child mortality by 27% (strong evidence), and reduce mothers' clinical status by 58% (weak

evidence), and mothers' parasitemia by 47-88% (strong evidence). Preventive schemes with anti-malarial drugs reduce children's clinical condition / status by 28-53% (strong evidence).

Evidences on effective interventions in the treatment of malaria show that artemisinin is the best anti-malarial drug (83). Malaria treatment consists of attacking blood parasites with anti-malarial drugs. In some countries and regions, parasites have currently shown resistance to several of these drugs. The treatment scheme recently recommended by the WHO involves a combined treatment of anti-malarial drugs based on artemisinin. Evidence shows that artemisinin has efficacy levels above 90%.

Compared to quinine, the use of artemisinin in handling complicated malaria has shown it reduces mortality by 10-38% (strong evidence). A supporting standard therapy (e.g., replacement of liquids) is recommended in serious malaria cases.

Stage 2. Definition of priority geographical areas, target or beneficiary population

At this stage, the technical team will identify priority geographical areas according to demographic and epidemiological indicators, social determinants, coverage of services and epidemiological situation. The target or beneficiary population and service networks from priority areas are then defined (See example in box 3). This technical proposal is then discussed with regional authorities to validate its viability and make the necessary adjustments.

Approximately 50% of the Peruvian population currently lives in areas with ecological factors that favor the transmission of malaria. These areas account for approximately 70% of the national territory and have different characteristics that create different malaria transmission risk scenarios in Peru. The main scenarios are located in three areas (Northern coast, Amazon jungle and Central jungle), with very different transmission patterns among them.

Box 3. Priority areas to reduce malnutrition in the San Martín region

The San Martín region has prioritized 33 districts for its San Martín Regional Nutrition Program. Sixteen of these districts belong to poverty quintile 1, and 7 belong to quintile 2. The prevalence of malnutrition in these districts is higher than 22%. In 21 districts, one-fourth of the children under 5 years of age have chronic malnutrition. The rural population in these districts accounts for more than 45% of the total population. Fifteen of these districts have more than 60% of rural population.

A regional technical team and USAID/Políticas en Salud designed an intensive, focalized and cumulative inter-sectoral strategy to increase the coverage of effective interventions and improve the quality for the delivery of services. The program will start providing care to all pregnant mothers and newborns born in the first year of the program, so they may receive all the effective interventions until they are four years old. The next cohorts of newborns from the following years will be provided cumulative care, so they may also receive all effective interventions (Chart C1).

Chart C1. Example of the application of the strategy. Total number of pregnant mothers and cohorts of children from 33 prioritized districts incorporated to the San Martín Region Malnutrition Reduction Program in five years of intervention.

		Children ages				
	Pregnant	<1 year	1 year	2 years	3 years	4 years
Year 1	13,819	11,054				
Year 2	13,819	11,054	10,954			
Year 3	13,819	11,054	10,954	10,899		
Year 4	13,819	11,054	10,954	10,899	10,824	
Year 5	13,819	11,054	10,954	10,899	10,846	10,824

Thus, the program will start providing care to all children in gestation and newborns from prioritized districts because interventions to improve nutrition are more effective at this stage of life. The coverage or prenatal care is high because it is possible to attract children from their gestation and then ensure the follow-up of their growth and development.

To start with a new cohort of children allows the gradual implementation of the program. This is a crucial aspect to accumulate capacities and competencies for the next years, in which successive cohorts of children will be incorporated. Gradual implementation has implications at the level of the necessary resources (additional costs) that make this a financially viable plan.

The malaria transmission pattern on the Northern coast, established in the poorest provinces of the departments of Piura and Tumbes, is characterized by the existence of areas receptive to the vector in the coastal valleys and by the seasonal migration of people who carry out agricultural activities. The winter season goes from April to November, with a covered sky and cool days; while the summer season goes from December to March, and it is hot and rainy. However, this seasonality may vary during the years of “El Niño” phenomenon, when the region is affected by torrential rains and strong winds that lead to floods and landslides. The proximity to Ecuador and the presence of the same vector (*Anopheles albimanus*) has favored the emergence of cases caused by *P. falciparum*, albeit in lower proportion than in the Amazon jungle. The most affected population on the North coast lives in precarious rural houses and is devoted to agricultural activities, such as growing rice. These crops prepare and maintain the place where mosquitoes live and reproduce.

In the transmission pattern in the Amazon jungle, it is the jungle *per se* the one that provides the mosquito with the ideal environmental conditions for its reproduction. The Amazon region (which occupies two-thirds of the Peruvian territory) only lodges 9–11% of Peru’s population, but reports over 70% of malaria cases. Malaria caused by *P. falciparum* is more frequent in this region, due to the presence of a highly efficient vector–*Anopheles darlingi*. In areas, such as Madre de Dios, human activities invade the vector’s niche and favor the transmission of malaria, such as the migratory flow due to the mining activity and the construction of the Interoceanic Highway.

The Amazon jungle has two main seasons: the dry season from May to October with high temperatures, and the rainy season from November to April with temperatures that reach 36°C and heavy rainfall that considerably increases the riverbeds, leading to the overflowing of minor tributaries. Most communities do not have roads or other forms of transportation than small boats. Most of the *mestizo,* native and indigenous population lives along the Amazon River and its tributaries. Within this population, there are people who have little exposure to the modern world, with limited geographical access. In the Amazon jungle, the economy is based on subsistence agriculture, fishing, timber extraction, trading activities and oil extraction.

In the transmission pattern of the Central jungle, located in inter-Andean valleys up to 2,300 mm from Junín and Pasco, predominates malaria caused by *P. vivax*. The main implicated and

identified vectors are: *A. pseudopunctipennis*, *A. oswaldoi*, *A. nuneztovari* and *A. rangeli*. The main source of income in this area is agriculture, predominating coffee and fruit crops (citrus fruit and bananas). The second most important economic activity is logging. This gives rise to the entry of groups of people to different ecological niches, and this poses the risk for the emergence of outbreaks in the population. The factors that condition and determine the presence of the disease in transmission risk scenarios from the three described areas may be quite different, and this requires a differentiated approach for the proper control of the disease.

At present, preventive activities regarding malaria are globally designed for the country; however, it is necessary to have interventions appropriate to the transmission risk scenarios and to reduce the risk in the most vulnerable people, such as isolated populations (ethnic and indigenous groups) and groups that carry out extractive activities in geographically inaccessible areas. Over 90% of malaria cases emerge in an autochthonous manner in poor and extremely poor districts, one of whose characteristics is their high dispersion and difficult access to the means of communication. These aspects condition the delay in the detection and diagnoses of cases due to a limited diagnostic coverage through microscopy or by rapid diagnostic test.

Consequently, the design of the decentralized management of malaria prevention and control must be carried out in accordance with the characteristics of the geographical spaces, because the strategies and costs to expand the coverage of the services to the poorest, rural and less accessible areas that are most affected by malaria depends on this.

Stage 3. Establishing the coverage targets for effective interventions and services

Once it establishes the geographical areas and the target population, the technical team estimates the volume of services of each effective intervention, according to the coverage expected until the year when the forecasted target or result is achieved. This information is discussed in a workshop with the experts and authorities of the regional government, DIRESA and other regional bureaus and organizations related to the health priority.

The basal coverage is determined first of all, based on secondary source effective interventions (surveys, statistics on services and research). The technical team establishes the targets to increase the effective coverage. The impact of the increase in this coverage on the health priority indicator is calculated on the basis of the effect measures of each intervention. These effect measures are obtained from the systematic review carried out at the first stage. The effectiveness of the interventions is measured in the investigations reviewed with the relative risk, odds ratio or attributable risk (See example in Box 4). The health indicator target is calculated with a basic formula:

DALYs or cases avoided by each intervention = (baseline of the number of patients, cases or DALYs for each cause) x (effectiveness of the intervention) x (change in the coverage).

Box 4. Estimation of the impact of the increase in the coverage of effective interventions on the malnutrition of children under 5 years of age in the San Martín region

The impact of the targets of increase in the coverage of effective interventions selected to reduce malnutrition in San Martín was carried out following the methodology Butha et col. (2008) and the Bellagio Group (2003). This methodology was used as basis for the development of the Lives Saved Tool (LiST-Child Survival) software by a team of the Johns Hopkins University(85). This software was included in another software, SPECTRUM (86),

developed by USAID, so these calculations may be adjusted to the characteristics and demographic forecasts, the prevalence and combination in the use of contraceptives, the socio-economic level and access to water and sanitation services. The basic mathematical formula for calculating the impact used by this software is:

Lives saved or malnutrition cases avoided by each intervention = (baseline of number of deaths due to each cause) x (effectiveness of the intervention) x (change in the coverage)

To calculate the impact of effective interventions on malnutrition, it is necessary to have data from the basal coverage of these interventions and establish their targets by the end of the scheduling period. This methodology was applied in the San Martín region with the authorities and specialists of the regional government and the technical assistance of the USAID/Políticas en Salud.

The basal coverage of these effective interventions is mostly found in the 2009 Demographic and Family Health Survey (DHS). Interventions without data are not used for the calculations, so the prevalence of chronic malnutrition is reduced by the effective interventions whose change has been decided.

The cumulative effect in avoiding malnutrition in each cohort of children, due to the improvement in the coverage and quality of effective interventions. The estimated calculation indicates that the prevalence of malnutrition in prioritized districts and in the region starts to decrease as from the second year of intervention. Thus, it is expected to reduce the prevalence of malnutrition in San Martín by 11%, four years after the project was implemented (Chart C2).

Chart C2. Example of the calculation of the impact of the program: Impact on the prevalence of malnutrition in children under 5 years of age in the San Martín region for a 90% coverage of effective interventions in cohorts of children from 33 prioritized districts over the 5 years of the program.

	Children ages					Malnutrition cases avoided in children	expected in the San Martin region	Reduction of malnutrition in the region
	<1 year	1 year	2 years	3 years	4 years			
	Basal						26.2%	0.0%
Year 1	638					638	27.4%	0.6%
Year 2	638	1,154				1.792	25.3%	2.9%
Year 3	638	1,154	1,109			2.901	21.9%	6.3%
Year 4	638	1,154	1,109	1,143		4.044	17.0%	11.2%
Year 5	638	1,154	1,109	1,143	935	4.979	12.6%	15.6%

Stage 4. Calculation of the costs and budget for the increase in the coverage of effective interventions and services

At this stage, the technical team estimates the costs and prepares a budget for each effective intervention. In a workshop with regional authorities and officers, the information is subsequently validated and the viability of the budgets is evaluated. Finally, regional government authorities make the decision of scheduling actions according to the resources available.

The recommended costing technique is that which combines the standard costing method per ingredient with the cost per activity. The estimated budget corresponds to the allocation of resources to increase the coverage in a temporary horizon that covers human resources, equipment, availability of supplies and medicines, as well as the activities necessary to implement effective interventions and key services (87).

Importantly, more than two decades ago, the needs for economic calculations in the health sector have a higher demand of proving a certain relationship between what is spent and what

is obtained. Along this line of demand, the results-based budget approach starts to be applied in the country. The results-based budget (PpR) is currently a guideline of the policy of the Ministry of Economy and Finance (MEF).

Within this budgetary planning framework, since malaria prevention and control activities are included in the PpR, it is recommended to transfer the regional budgetary planning databases to a more friendly information environment for their understanding and analysis, and to obtain information about the prices relevant to the costing for supplies, materials and medicines, and the presentations of each product (87).

Box 5. Calculation of costs and budget for the increase in the coverage and improvement in the quality of effective interventions for reducing malnutrition in the San Martín region

The USAID/Políticas en Salud team together with the San Martín regional team estimated the *per capita* cost of effective interventions (without including interventions in water and sanitation because this cost was in charge of the regional government's Regional Bureau of Housing and Sanitation). The *per capita* cost of interventions aimed at pregnant women was estimated at 435 Nuevos Soles, the interventions for children under 1 year of age were estimated at 560 Nuevos Soles; the interventions for 1-year old children, 268 Nuevos Soles; those for 2-year old children, 200 Nuevos Soles; those for 3-year old children, 127 Nuevos soles; and those for 4-year old children, 129 Nuevos Soles.

As there is a partial coverage of most effective interventions, a methodology to estimate the additional cost required to increase the coverage of and improvement in the services was developed. Thus, for the prioritized districts of the San Martín region, it has been estimated that S/.2,117,000 (two million one hundred seventeen thousand Nuevos Soles) are additionally required for the care of pregnant mothers, and S/.4,821,000 (four million eight hundred twenty-one thousand Nuevos Soles) are additionally required for the first cohort of children. Then, the budget increases as more cohorts of children are integrated to the program (Chart C3).

Chart 3. Example of the calculation for the financing: Additional financing (Nuevos Soles) required for the San Martín Region Child Malnutrition Reduction Program through the expansion of the coverage of effective interventions in cohorts of children from 33 prioritized districts over the 5 years of the program.

		Children ages					Annual budget
	Pregnant	<1 year	1 year	2 years	3 years	4 years	
Year 1	2,117,245	4,821,193					6,938,438
Year 2	2,117,245	4,821,193	3,121,939				10,083,377
Year 3	2,117,245	4,821,193	3,121,939	2,646,765			12,707,142
Year 4	2,117,245	4,821,193	3,121,939	2,646,765	1,638,532		14,345,674
Year 5	2,117,245	4,821,193	3,121,939	2,646,765	1,638,532	1,667,235	16,012,910

The construction of databases of quantities and prices, and the identification of different categories of analysis at disaggregated level allows obtaining budget reports by type of effective intervention, expense categories and financing sources. It is extremely useful that the cost of effective interventions organized in this way is comparable to the actual budgeted amounts of programs or services already existing in the region, to learn the gap of financial resources which the regional government must cover in the short term with additional financing. This gap is created by the increase in the quality and coverage of services already considered in budgetary programs and by those effective interventions which are not yet included (87).

The calculation of *per capita* costs of effective interventions must be performed on the basis of the applicable legislation or service protocols. This provides a "referential price" to make a rapid

estimation of orders of magnitude of financial resources in any space, without overlooking the evaluation of considerations regarding context and regional problems which are the underlying causes of the health priority in each case (87).

This calculation implicitly assumes a specific installed capacity to produce services. It is necessary to check the provision of resources, mainly the number and distribution of human resources and the execution of key administrative, general and logistics processes that support the implementation of effective interventions. This topic precisely corresponds to stage 7 related to the preparation of operational manuals and identification of key administrative and logistics processes for an efficient and effective implementation of the interventions.

Stage 5. Rapid evaluation of restrictions for the delivery of services and expansion of quality coverage, and calculations of the human resource gap.

It is necessary to make a rapid diagnosis of the operation of effective interventions, to identify the restrictions of the operation of this program and the delivery of services.

The rapid evaluation is carried out according to the proposed conceptual framework, which consists in finding out the restriction and extent to which this restriction may be eliminated or reduced. Interviews are made to key informers and health services of all levels of care are visited in the prioritized spheres, to investigate the restrictions in: i) management and organization; ii) management of human resources; iii) management of critical supplies; iv) management of information; v) management of current budget; vi) management of investment. The knowledge of the limitations faced by the regions is essential for estimating the resources necessary to expand the coverage of effective interventions and the strategic decision making about the forms of delivery, sequence of actions and level of expansion of the services. Thus, the decentralized management requires the strengthening of health systems and provision of more resources to the health sector.

The definition of a specific conceptual framework on decentralization and prevention and control of malaria in Peru is recommended to perform the rapid evaluation. This framework must include the regular (day-to-day) management, and the management of special situations (outbreaks, epidemics). The follows the preparation of questions and data collection instruments. The analysis plan must differentiate the management of the prevention and control of malaria into two categories: a) management of regular activities: epidemiological surveillance, prevention and control; b) management of special situations, such as outbreaks or epidemics: control and surveillance. The following table shows the categories of the analysis plan.

Table 5.1. Categories of the analysis plan by decentralization phase and type of management of malaria prevention and control activities

Management	Category	Central level	Regional level	Local level
Post-decentralization phase				
Management of regular	Financial			

Management	Category	Central level	Regional level	Local level
activities: Epidemiological Surveillance, and Prevention and Control	Operational			
	Technical assistance, supervision and evaluation			
	Others			
Management of special situations, such as outbreaks or epidemics: Control and Surveillance	Financial			
	Operational			
	Technical assistance, supervision and evaluation			
	Others			

The suggestion is to organize the recommendations differentiating the management of prevention and control of malaria into two categories:

a) **Management of regular activities: epidemiological surveillance, prevention and control.** Institutional arrangements to ensure a management that allows to carry out:

Epidemiological surveillance of malaria: therapeutic response monitoring (availability and use of medications, treatment efficacy), vector control response monitoring (vector surveillance and change in number of malaria cases), mapping of case distribution (by community, by production activity), development of indicators for the early detection of outbreaks and epidemics (endemic channel and vector surveillance).

Prevention: timely case management: protocol for diagnosing and treating malaria, mapping the distribution of health care establishments with laboratory diagnosis service (trained person plus microscope, lancet, glass slides, others); active (search for febrile cases) and passive (includes diagnosis and treatment).

Vector control: protocol for the use of insecticides, protocol for the surveillance of potential breeding sites (water sources and reservoirs), protocol for vector control (protected communities and homes), selective use of larvicides, insecticide-treated mosquito nets.

b) **Management of special situations, such as outbreaks or epidemics:**

Rapid evaluation of the regional capacity for the early detection of outbreaks and epidemics, evaluation of epidemic risks, capacity for timely logistics actions in the procurement of supplies and medications and hiring of personnel, among others.

Table 5.2. Categories of analysis and key issues in decentralized management

Categories of analysis	Management of regular activities: Epidemiological Surveillance, Prevention and Control
Financial	- Financing sources (public, international cooperation projects or programs) - Focusing expenses (by number of cases, annual parasite index (API) by district, location or others) - Own income
Operation (organization of the service	- Norms (existing at each level) - Local or regional autonomy to make adaptations to a local situation - Provision of supplies and medicines - Methods of payment to health care services (networks, by facility) - Methods of payment to external personnel: promoters, sprayers, others) - Methods of payment to health care staff (appointed, CAS contract, non-personal services) - Focusing activities
Technical assistance, supervision and evaluation	- Selection of personnel responsible at each level - Personnel training - Supervision and monitoring of actions - Evaluation
Information system	- Guides for promoters (febrile cases) - Registers of febrile cases - Register of cases - Data collection and integration system - Use of information for decision making
Others	- Foreign cooperation projects and/or programs / NGOs, / Others - Relationship with companies that carry out risk production activities

Adapted from *Decentralization and Governance in health*. Thomas Bossert, Ph. D. Harvard School of Public Health. Health Governance Workshop. Washington DC. June 13, 2007. Health Systems 20/20 USAID.

The capacity for the epidemiological surveillance of malaria, follow-up on therapeutic response and vector control response monitoring are also evaluated.

The findings of this evaluation are discussed with the specialists, regional government authorities, DIRESA and users.

Stage 6. Calculation of the human resource gap in health care (88)

The increase in service coverage requires providing a basic professional team to health care establishments.

The starting point for the aforementioned is the conceptual framework for providing basic teams of professionals related to Primary Health Care, with a person-oriented approach. An appropriate number of health professionals integrated in health care teams is required under this framework. The formation of these teams depends on the health care needs in a specific

territory and the reference population. The legislation on this matter in the country[4] recommends prioritizing the formation of teams composed of professionals in human medicine, nursing and obstetrics, complemented by nurse technicians.

One of the main problems Peru is facing in health care is the deficit of its human resources. According to the WHO, the countries and sub-national territories may be classified according to the "Human Resource Density" indicator, which is the sum of professionals in human medicine, nursing and obstetrics per 10,000 inhabitants.

Twenty-five professionals per 10,000 inhabitants is considered an acceptable availability. Over 25 is considered a high availability; and under 25, a low availability or a "country with a critical deficit of human resources for health care." The implication of a critical deficit of human resources for health care makes it improbable to achieve the coverage of effective interventions.

Compared to the rest of the countries in the world, Peru is considered a country with a critical deficit of human resources, and it is also worth noting that there are regions with a higher deficit.

The process of providing basic teams to increase the coverage of effective interventions of the regional health priority, is based on answering the question: What is the minimum staff requirement to complete the basic teams in the immediate period? The recommendation is to take into account the following: a) size of the population allocated to the health care network; b) territorial analysis with the geographical identification of the roads and times of access of the target population to health care services; c) identification of strategic facilities according to their location and category.

The information required is: number and composition of personnel at facility level, allocated population, maps with information on access roads and time to arrive from the homes to the health care service, and categorization of facilities. The information generally comes from the Human Resource Office of the DIRESA and the Regional Bureau of People's Health.

Human resource gaps for each service network and the necessary additional budget (See example in Box 6 below) for the operation of the program are established.

Box 6. Human resource gap analysis in the San Martín region to increase the coverage of effective interventions that reduce child malnutrition

[4]Comprehensive Health Care Model based on the Family and Community. Ministry of Health, Lima – Peru, 2011

Compared to the rest of the regions, the San Martín region ranks as the penultimate region with a critical deficit of human resources (12.7 professionals per 10,000 inhabitants), only above Cajamarca.

The RHUS density in these districts has been calculated. Considering the appointed and stable hired staff, this situation is critical, as shown in the graph below under the same human resource density indicator. A high availability of technical staff is also evident.

The situation of the professional staff improves a little, if the SERUMS staff is included. Note that the density indicator is equivalent to 7.06 professionals per 10,000 inhabitants, in the first case; and it goes up to 10.09 when the SERUMS professionals (who have a limited permanence in the position) are added. In both cases, it is below the WHO standard (25 per ten thousand inhabitants).

In short, the San Martín region has a low availability of professional human resources. The requirement of additional personnel to serve the population of pregnant women and children from the 33 prioritized districts is shown in the following table. The budget is calculated in Nuevos Soles.

Additional personnel requirements				
	Number	Average monthly salary	Annual payment	Budget
Doctor	28	3719	45227	1266368
Nurse	25	1051	13215	330375
Obstetrician	11	1051	13215	145386
Total				1742110

Stage 7. Design of the operation

The increase of the coverage and improvement in the quality of services related to prioritized effective interventions requires redesigning the operation and management of the operations; i.e., define the organization, processes to attract and follow up on beneficiaries and operational processes for the delivery of services, so as to do it in an efficient and effective manner.

Consequently, the operations manual and implementation plan that will allow increasing the coverage of good quality effective interventions in a decentralized health system are required. This manual must be in accordance with the technical standards of the Ministry of Health. The operations manual and implementation plan must be approved by the regional government, to turn them into an order and to allocate the resources.

The standards for the provision of services and adjustment of procedures are established to implement the delivery of the services of the effective interventions. These standards are included in the performance measurement instruments for the delivery of the services. The instrument is validated by a basal performance measurement. The methodology for measuring gaps and closing gaps with action plans will be validated. A methodological guide is subsequently developed for this purpose.

A road map in then developed to manage the financing, the budgetary programming in the executing units, the hiring and training of new personnel, implementation of the information system, follow-up and supervision.

Stage 8. Development of mechanisms for inter-governmental and inter-sectoral relationships

There is a consensus that the control of metaxenic diseases cannot be carried out only from the health sector, because the spreading of these diseases depends on social behavior and favorable environmental conditions.

The migration for agricultural and extractive activities, irrigation method, deforestation and construction of highways in the ecological niches of vectors cannot be controlled. However, they may be regulated with a social responsibility approach and taken into account for developing strategies and actions that prevent metaxenic diseases. This regulation and many of these community actions do not depend on the health sector.

Favorable environmental conditions for the development of vectors are related to the type of housing, storage of consumption water, accumulation of useless items, environmental sanitation, creation of artificial breeding areas and tidiness of the environment. Drinking water provision and environmental sanitation and public cleaning services do not depend on the health sector, but on other sectors, and on local governments.

Consequently, the control of metaxenic diseases particularly depends on the intervention of other sectors, such as housing and sanitation, education and environment, apart from effective health services for the corresponding prevention, diagnosis and treatment. For this reason, the management of the control of these diseases must be in charge of the regional government itself, which is able to connect the actions of all sectors and local governments.

Vector control actions require the participation of the community (local authorities, religious leaders, health promoters, teachers, community leaders) for the treatment of breeding grounds and houses, cleaning ecological breeding areas through community work, campaigns for collecting and disposing of useless items (89).

Some experiences have proven that community action can control malaria without using insecticides (just by using pyrethroids inside the houses during outbreak periods), in an effective and sustainable manner (90, 91).

Health care services are currently organized in service networks in accordance with a geopolitical map that does not necessarily coincide with the geo-ecological map of metaxenic diseases. There are areas at risk of metaxenic diseases that are farther from the facilities of a regional jurisdiction, but closer to facilities that belong to another region. There are also regions that have more technical and decision making capacity for dealing with metaxenic diseases than others.

To make the scarce resources more efficient, it is possible to execute inter-regional agreements, so that in some boundaries services may be organized to develop actions for controlling and handling outbreaks and cases at the risk areas of neighboring regions, according to the access to services with decision making capacity to face these diseases.

Metaxenic diseases cannot be controlled with isolated actions launched by the regions, because in many cases there are areas with these diseases that affect common areas or more than one region and because the performance of actions to prevent and control these diseases may be improved if commitments involving accountabilities are reached between MOH and the regional governments.

The accountability of management agreements is itself a strong stimulus to comply with commitments (92). The key component of these accountability systems is the definition of performance standards that allow determining whether or not they were complied with. This model is accompanied by awards and sanctions. The evaluations of responsibilities are applicable to organizations and professionals in charge of public services and implementing financed programs (93). A baseline in necessary to determine whether the compliance with responsibilities reached positive results. Accountability mechanisms should be focused on the elements of the program that may be changed with the idea of improving the results.

Based on prior experiences of inter-governmental connection, it is recommended to introduce in the agenda of the CCLs, CCRs and CIGS the development of management mechanisms and agreements for the implementation of national policies regarding health priorities.

It is also recommendable to create spaces for the specific coordination on determined health priorities. In the particular case of metaxenic diseases, it is recommended to re-establish a National Technical Committee with the participation of the regions.

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