

# Assessing Options for an Innovative Malaria Control Program on the Basis of Experience with the New Colombian Health Social Security System

CARLOS A. AGUDELO C<sup>1</sup>, AUGUSTO CORREDOR A<sup>2</sup>, y MARÍA VICTORIA VALERO<sup>3</sup>

<sup>1</sup>Médico. M. Sc. Salud Pública. M. Sc. Ciencias. Instituto de Salud Pública, Facultad de Medicina, Universidad Nacional de Colombia. E-mail: caagudeloc@unal.edu.co

<sup>2</sup>Médico. Especialista en Medicina Tropical. Instituto de Salud Pública Facultad de Medicina, Universidad Nacional de Colombia. Bogotá, DC. Tel 3165405

<sup>3</sup>Bacterióloga. M. Sc. Epidemiología. Investigadora independiente. E-mail: mvvalerob@unal.edu.co

---

Recibido 14 Noviembre 2003/Enviado para Modificación 21 Enero 2004/Aceptado 28 Junio 2004

## ABSTRACT

**Objectives** Designing and proposing alternative models for municipal and Departmental malaria control programmes based on evidence obtained concerning the process of malaria on the Colombian Pacific Coast and regarding key problems in the malaria control programme before and following health system reform in 1993.

**Methods** An evaluative study was carried out, comparing the situation before and following the 1993 reform; model design was also compared. Control programme is understood as being the institution, the human group and administration in charge of control activities. The study was carried out in 2002 and 2003, in the Departments along the Colombian Pacific Coast; the four departmental capitals, 28 malarial and 5 control municipalities were included primary and secondary information was obtained by means of surveys and semi-structured interviews, community meetings and reviewing documentation in the secretariats of health, the Vector-borne disease control programme-VBDC, the Expanded Immunisation Programme-EIP, Health Promoting Entities-HPE, Subsidised Regime Administrators-SRA and Service-Providing Entities-SPE.

**Results** The following results were obtained: 1. Illustrating and analysing malarial tendencies in the country and on the Pacific Coast, and the corresponding institutional transformations in the programme; 2. Characterising

the control programme which existed before 1993; 3. Characterising departmental modes of decentralising the programme; 4. Identifying the effects of reforming the system and characterising control programme problems; 5. Comparing the programme with the Expanded Immunisation Programme (EIP); 6. Comparative analysis of the programme and identifying current gaps in management capability; 7. Actors' perceptions regarding the control programme; 8. Values and challenges for an innovative control programme; and 9. Designing a model for up-dating/adapting the control programme.

**Discussion** Malaria control programmes' problems and weaknesses are frequently and inarticulately attributed to the lack of knowledge and management skill of personnel working in such programmes, the lack of an information and communication system or weaknesses in the municipalities or personnel. These factors may well have had an effect; however, a global and institutional approach leads to locating the programmes within a social, political and cultural context. This allows interpreting control programmes' current problems, amidst decentralisation and reform processes, and linking this interpretation to modelling and opening a space for innovation in such programmes. The study's main limitations spring from particularities regarding Pacific Coast control programmes and weakness in health information systems.

**Key Words:** Malaria, control programme, models, decentralisation, healthcare system, Colombia (*source: MeSH, NLM*).

## RESUMEN

### **Evaluación de opciones para un programa innovador de control de la malaria, con base en la experiencia del Sistema de Seguridad Social en Salud de Colombia**

**Objetivos** Diseñar y proponer modelos alternativos para los programas municipales y Departamentales de control de la malaria, con base en evidencias obtenidas sobre el proceso de la malaria en la Costa Pacífica de Colombia y sobre las problemáticas claves del programa de control de la malaria antes y después de la reforma del sistema de salud de 1993.

**Métodos** Se realizó un estudio evaluativo, de comparación antes y después de la reforma de 1993, y de diseño de modelos. Por programa de control se entendió la institución, el grupo humano y la administración que están a cargo de las actividades de control. El estudio se llevó a cabo durante el año 2002 y 2003, en los Departamentos de la Costa Pacífica colombiana. Se incluyeron las cuatro capitales departamentales, 28 municipios maláricos y 5 de control. Se obtuvo información primaria y secundaria, por medio de encuestas y entrevistas semiestructuradas, reuniones comunitarias y revisión documental en secretarías de salud, programa de Enfermedades Transmitidas por Vectores-ETV, Programa Ampliado de Inmunizaciones-PAI, Empresas Promotoras de Salud-EPS, Administradoras del Régimen Subsidiado-ARS e Instituciones Prestadoras de Servicios-IPS.

**Resultados** Se obtuvieron los siguientes resultados: 1. Ilustración y análisis de las tendencias de la malaria en el país y la Costa Pacífica, y las correspondientes transformaciones institucionales del programa. 2. Caracterización del programa de control antes de 1993. 3. Modalidades departamentales de la descentralización del programa. 4. Identificación de los efectos de la reforma del sistema y caracterización de las problemáticas del programa de control. 5. Comparación con el programa PAI6. Análisis comparado del programa e identificación de brechas actuales en la capacidad de manejo. 7. Percepción de los actores sobre el programa de control. 8. Valores y retos de un programa de control innovador. 9. Diseño de un modelo para adecuación del programa de control.

**Discusión** Las problemáticas y debilidades de los programas de control de la malaria se atribuyen con frecuencia, y de manera desarticulada, a la falta de conocimiento y habilidades gerenciales del personal que labora en el programa, a la carencia de un sistema de información y comunicación, a la debilidad de los municipios o del personal. Si bien estos factores han incidido, una aproximación más global e institucional permite ubicar los programas en un contexto social, político y cultural. De esta manera es posible interpretar las problemáticas actuales de los programas de control, en medio de los procesos de descentralización y reforma, y enlazar esta interpretación a un ejercicio de modelamiento que abra espacio a la innovación en tales programas. Las principales limitaciones del estudio se desprenden de las particularidades de los programas de control de la Costa Pacífica y de la debilidad de los sistemas de información en salud.

**Palabras Claves:** Malaria, programa de control, modelo, descentralización, sistema de salud, Colombia (*fuentes: DeCS, BIREME*).

**A**round 85 % of Colombian territory is endemic for malaria (1-4). More than 250 000 confirmed cases were registered in 1998. In 2000, 129 municipalities (12 % of the total) and 3 million inhabitants (7,5 % of the total) presented an Annual Parasite Index (API) greater than 10 per thousand inhabitants and constant transmission. The incidence of urban malaria has increased during the last decade, affecting more than 20 municipalities (5). The areas having the greatest risk of transmitting the disease are the Pacific Coast, Urabá, the lower river Cauca, the upper river Sinú and the territories of Orinoquía and Amazonía (6). On the other hand, 1,7 million people (4.1% of the total) live in territories having controlled transmission and around 13.4 millions people inhabit areas having sporadic transmission.

A sequence of changes having a great effect occurred in Colombia during the 1990s, corresponding to the process of globalisation and international politics regarding liberalising economies and restructuring countries (7). The cepalin (*Comisión Económica para América Latina - CEPAL*) model for de-

velopment employed during the previous fifty years was abandoned and a development model centred on structural adjustment and reducing fiscal deficit programmes became adopted. At the same time, the National Health System (NHS) was abandoned and Law 100, 1993, created the General Social Security in Health System (GSSHS). This dealt with a system of regulated competition, a mixed public/private model (8,9) based on public contracts (10), which has also been called structured pluralism (11).

The Ministry of Health, the National Council for Social Security in Health and Sectional and Local Health Offices represent the GSSHS management and control organisms. The system has two affiliation regimes; there is the contributory system receiving 12 % of a person's wage (4 % from the employee and 8 % from the employer) and the subsidised system for the poor population, representing people who cannot afford to make a contribution. 52,3 % (12,13) of the total population were affiliated in 2000, 30,5 % in the contributory regime and 25, 2 % in the subsidised regime. The public and private entities insuring the system are the Health Promoting Entities (*Empresas Promotoras de Salud - EPS*) and the Subsidised Regime Administrators (*Administradoras del Régimen Subsidiado - ARS*). The former receive contributions, transferring that surplus value relating to each affiliated family called Unit of Payment per Capitation (UPC) to the Solidarity and Guarantee Fund (*Fondo de Solidaridad y Garantía - Fosyga*). The latter receive resources from general taxes, via Fosyga and the Seccional and Local Health Offices. The Service-Providing Institutions (SPI) are both public and private.

The set of services for people is called the Compulsory Health Plan - CHP (*Plan Obligatorio de Salud - POS*), which is more extensive in the contributory than in the subsidised regime. Public health activities were grouped into a Basic Attention Plan – BAP (*Plan de Atención Básica – PAB*), in the hands of departmental and municipal authorities. A large part of those prevention, monitoring, diagnosis and treatment activities relating to a set of diseases including malaria, leishmaniasis and dengue is financed by CHP and BAP resources; these are managed by the Vector-borne disease (*Enfermedades Transmitidas por Vectores – ETV*) control programme.

55 % of Colombia's population remained below the poverty line from 1995 to 2002 (14-25). Health insurance coverage and spending has grown, but inequality in access to and use of services remains. Departments and municipalities have progressively assumed management of public health activities and transmittable disease control programmes, without achieving a suitable transition towards decentralisation and a model of regulated competition (5,26-32). Very little research has been done regarding the last aspect to en-

sure that results regarding difficulties concerning decentralisation and reform processes can be understood. Some of them (5,33) suggest problems regarding management capacity, financing, organisation, personnel, allocating funds, monitoring and intersectorial coordination.

A research project was thus designed and carried out for advancing understanding these complex phenomena; it proposed an alternative model for updating/adapting municipal and Departmental malaria control programmes, based on evidence obtained from the process of malaria on the Colombian Pacific Coast and key problems arising from the malaria control programme before and following health system reform in 1993. This included identifying gaps in the ability for local management of the control programme generated after the 1993 reform.

## METHODOLOGY

An evaluative study compared the situation before and following reform in 1993, as well as the design of models. The control programme was interpreted as being that institution governing or entrusted with control activities by means of a human group and administration. Models were interpreted as being formal or systemic representations of some hypotheses contributing towards obtaining a command of observations and experiences (34,35). The design of an institutional model corresponds to a coordinated organisation, administration and operation programme.

### Population and Methods

The study was carried out in the Departments bordering the Colombian Pacific Coast: Chocó, Valle del Cauca, Cauca and Nariño. These Departments' four capital cities (Quibdó, Cali, Popayán and Pasto, respectively), 28 other municipalities and 5 controls were included for a total of 37. The study group's municipalities presented endemic malaria and epidemic outbreaks and 89,3 % of them corresponded to municipal categories 5 and 6 (the poorest levels). Control group municipalities did not present malaria during the study, but did have the VBD programme on hand. Twenty-two municipalities (59,5 %) were decentralised, 18 corresponding to the study group (64,3 % of the group).

Primary and secondary information concerning the malaria control programme (before and after 1993) was obtained from the following:

102 Institutional surveys carried out with Departmental and municipalities' Vector-borne disease control programmes (VBD), Health Promoting Entities (EPS), Subsidised Regime Administrators (ARS) and Service-Providing Institutions (IPS);

65 semi-structured in-depth interviews carried out with departmental and municipal Health Secretariat functionaries, members of community organisations, key informants and NGOs;

6 unstructured interviews were carried out with functionaries from the former MES (Malaria Eradication Service), now involved with the current control programme;

20 meetings and workshops were held with institutional and community groups so that the situation regarding malaria and the control programme could be evaluated;

19 municipal, Secretariat of Health and Ministry of Health-National Health Institute documents pertaining to information systems, data-bases and malaria monitoring were inspected; and

32 national and international documents, books, reports and studies regarding control programmes in the country were consulted.

Information about the Extended Immunisation Programme (EIP) was obtained by means of semi-structured surveys. Survey and interview forms were tested and adjusted accordingly. People carrying out the surveys and interviews were similarly trained and submitted to a test of their consistency. Fieldwork was carried out between September 2002 and January 2003.

Suitable software (Stata, SAS, Epiinfo and NUD\*IST) was used for analysing the quantitative and qualitative information (36,37), using parametric and non-parametric tests, such as variance analysis, Fisher, Student t, Kruskal-Wallis and multiple correspondence tests.

Applying the following criteria did before-after comparison of the malaria control programmes: malarial trends, programme structure and organisation, functions or responsibilities, efficacy and gaps (planning, allocation of resources, personnel, training, monitoring of the disease and intersector coordination).

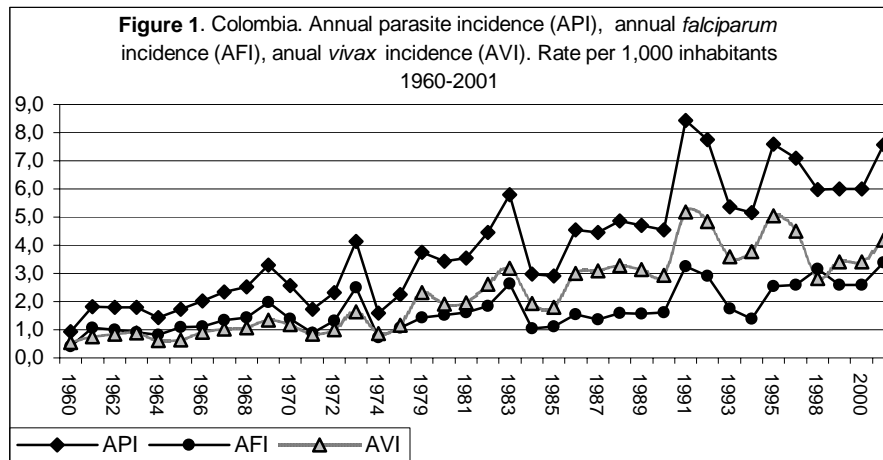
Comparison with other VBD programmes and the EIP was only done for the period after 1993. The modelling exercise was done from those results obtained from the previous methods, including principles, approaches, objectives, criteria, viability, scope, parameters and components.

## RESULTS

### 1. Control programmes: before-after comparison

#### Malarial tendencies

Two marked tendencies have characterised malaria in Colombia during the last forty years: decreased mortality and progressive increase in morbidity (Figure 1). In spite of cases being under-registered, representing between 15 % and 25 % according to region, an annual average of 160 thousand cases has been reached during the last few years, with frequent epidemic outbreaks and urban malaria occurring (38-43). *P. vivax* malaria predominates in Colombia.



The Pacific Coast area has represented a significant part of the problem regarding malaria in Colombia. Between 1960 and 1997, 10 % to 46 % of the total number of positive samples from the country corresponded to this region. However, *P. falciparum* malaria predominates on the Pacific Coast. On the other hand, the Pacific Coast has an appreciable list of municipalities pre-

senting urban malaria: Quibdó, Istmina, Condoto, Tado, Atrato, Bagadó, Sipí and Lloró in the Chocó Department; Buenaventura in the Valle del Cauca Department; El Charco and Tumaco in the Nariño Department; and Guapi in the Cauca Department (44-54).

#### The control programme before 1993

The Malariology Campaign (*Campaña Malariología*) was created in 1943 as a Section of the Interamerican Cooperative Public Health Service and a dependency of the Ministry of Work, Hygiene and Social Security. The Campaign became the Malariology Division in 1947; MES was created in 1956 as a dependency of the Ministry of Health Public, replacing the Malariology Division, putting into practice WHO recommendations for advancing centrally financed and controlled eradication programmes (55-61).

The MES consisted of a Central Office located in Bogotá, housing the Management and a laboratory. This had sections for engineering and operations with insecticides, epidemiology and chemotherapy, entomology, education and training and administration. It had technical and administrative autonomy and jurisdiction throughout the whole country (62). Control campaigns initially included a single annual DDT spraying cycle, protecting at least 50 % of the population living in malarial areas, but covering just 14,3 % of them.

The first eradication campaign began in August 1957 and was extended to October 1958; it was expected that this would achieve its purpose by interrupting the parasite's transmission cycle. Total coverage of malarial areas was maintained from 1959 to 1961. At the end of 1962 it finished its spraying operations and continued with monitoring and prevention activities. The Eradication Campaign was mainly based on intra-domiciliary DDT spraying and the mass, free distribution of medicine to patients suffering fever.

The MES functioned as a vertical programme centred on organising campaigns, being formally dependant on the Ministry of Health, but functionally autonomous respecting the latter. The eradication strategy was abandoned towards the end of the 1970s, but it was suggested that its methodologies should continue to be used (63). The control programme assumed the functions of active-passive detection of cases, diagnosis, treatment and vector control in 1969. Problems became identified throughout this whole period, such as the lack of continuity and official resources and weakness in epidemiological monitoring, as well as poor civil society participation. The Eradication Campaign did manage to reduce Colombia's malarial area from 92 %



to 85 % of the country's territory and contributed towards decreasing mortality.

The Special Direct Campaign Administrative Unit–SDCAU (*Unidad Administrativa Especial de Campañas Directas-UAECD*) was created in 1976 (64), one year after the creation of the National Health System. The Malaria Eradication Service's functions were assigned to this unit (65), its organic structure consisting of personnel distributed amongst 18 Regional Offices.

The Direct Campaign Division's control activities, carried out through regional programmes helped by central level, consisted of:

- Spraying with DDT and phenitroton, where resistance was detected;
- UVL spatial applications;
- Attending people with fever symptoms at 6 500 information posts; and
- Making diagnoses by 440 microscopes used by volunteers or Health functionaries.

The spraying, entomology, epidemiology, medication and case searching operations were undertaken throughout the whole country by 646 operators.

The process of decentralisation by which those functions regarding tropical disease control became progressively transferred to the Departments and municipalities began in 1986. The XV Heads of Region meeting in 1988 proposed methodologies in line with the decentralisation being experienced in the country, as well as monitoring and prevention strategies within the context of primary health attention (66) and a less vertical structure allowing the participation of the community and Sectional Health Services. This approach was also being promoted within the international setting, implying a change towards control programmes administratively structured for dealing with risks in geographical areas whose basic problems were demographic, social and cultural ones (67). This approach led the Seccional Health Services in Colombia to assume some functions in the control programme, but the main centralised and vertical parameters were conserved, since the Direct Campaign division closely followed the MES model.

#### Malarial tendencies and the control programme

Analysing the data relating to the 42 years presented in Figure 1 indicates that this series has great variability and strong self-correlation, preventing it from being valid for use in regression methodologies. On smoothing the se-

ries of data, the progressive increase in morbidity can be observed and three ascending cycles identified (ten years each). The long-term process of the malaria control programme has been divided into two periods for comparison purposes, bearing their transformations and health system characteristics in mind as follows:

1960-1991: the Malaria Eradication Service (MES) during the time of the National Health System; and 1992-2001: the Vector-borne Disease Control programme (VBD) during the time of the GSSHS.

In turn, some sub-periods can be identified during the first period:

- 1960-76: MES
- 1977- 1986: SDCAU
- 1987-1991: SDCAU and decentralisation.

Significant differences were found on regrouping the first two sub-periods and obtaining the average Annual Parasite Incidence (API), as indicated below:

Period	Average API	SD
1960-1986	2.696	1.146
1987-1991	5.333	1.366
1992-2001	6.556	1.236

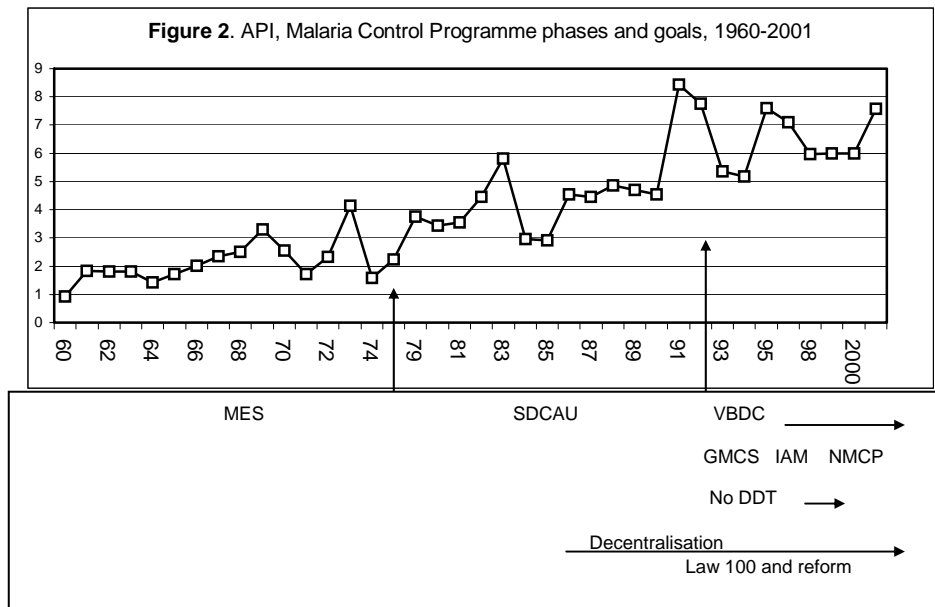
K-W test: 24.912 gl:2 p: 0.000004

API averages illustrate the increase in morbidity, even taking into account those limitations introduced by the variability of the data. Between the first and last API average there is a 143,5 % increase. The API for the third period represents a 23,1 % increase on the second period, whilst the API rose by 98,1 % during the last period respecting the first.

Figure 2 shows that malarial tendencies are related to transformations in the control programme and the processes of decentralisation and health system reform.

Two clear types of achievement were obtained during the period corresponding to MES and SDCAU; an appreciable contribution was made towards the decrease of mortality due to malaria and a methodology for effective operation, centred on spraying and medicament distribution campaigns. However, this MES model and methodology became superseded by new,

powerful social, cultural and political conditions in which the problem of malaria which unfolded during the 1980s. Morbidity increased rapidly from 1986 onwards. In the period following 1993, morbidity continued to increase and began to become expressed in a set of connected problems: repeated epidemic outbreaks, the parasite and vectors’ resistance, urban malaria and other similar problems. Even though it is not a good idea to simply attribute current complex problems regarding malaria in Colombia to decentralisation and health system reform, the evidence presented here suggests that the new health system and its VBD Programme has not managed to confront prior tendencies in a suitable way, nor prevent them becoming worse.



MES: Malaria Eradication Service; SDCAU: Special Direct Campaign Administrative Unit; VBDC: Vector-born Disease Control Programme; GMCS: Global Malaria Control Strategy; IAM: Initiative against malaria; NMCP: National Malaria Control Plan.

### Current programmes’ characteristics and problems

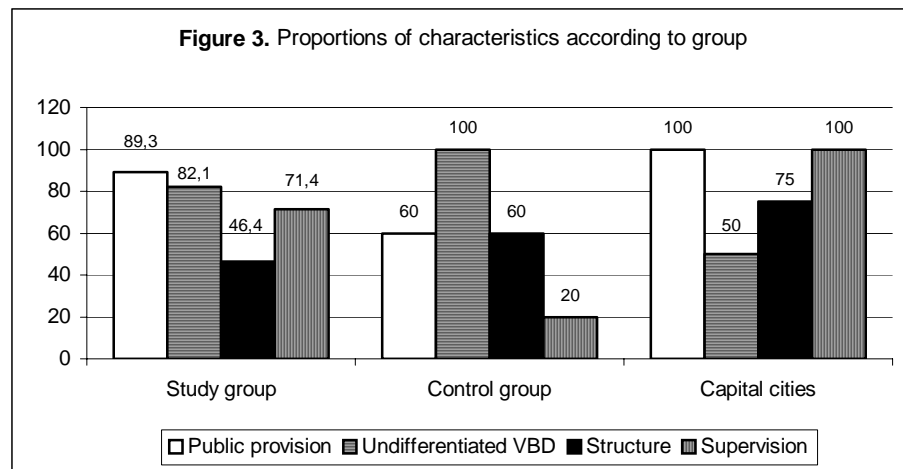
The results in terms of those variables considered are presented next. It should be pointed out that when significant differences were found between the study group and the control group, these have been specifically indicated.

*Service Providers.* The Secretariat of Health directly carried out VBD and malaria action in 86,5 % of those municipalities studied. Proportions per

groups are shown in Figure 3. Private entities were only found offering services in 3 (8,1 %) out of the 37 municipalities. However, in 16 (43,2 %) out of the 37 municipalities, the Secretariats of Health were using some form of contracting with municipal public entities, especially with SPEs, for totally or partially executing the VBD programme, especially activities regarding diagnosis, treatment and handling severe malaria.

*Ownership.* Control of malaria was part of the VBD programme in 30 (81,1 %) out of the 37 municipalities surveyed. It was thus not differentiated in terms of jobs, personnel or administration (Figure 3).

*Planning.* Annual operational plans (at Departmental and municipal levels) were frequently thrown off balance, not up-dated or out-of-date respecting malarial areas' specific needs and were submitted to multiple political influences.



*Organisational structure.* 51,4 % of the total had a structure including a management level, coordination/administration and execution levels, and at least one horizontal work division in the last two levels. The proportion of this structure increased on passing from the study group to the control group and the capital cities, as shown in Figure 3. Overlapping of dependency and job functions was frequently found within the framework of this structure. The VBD programmes were exceptional in that they had a shared mission or organisational goals. Management personnel recognised that they lacked participation and flexibility in allocating work and in decision-making regarding

organisation. At the same time they did not have stable relationships with training institutions or with properly equipped physical settings/entities.

*Control and supervision.* 86,5 % of the municipalities studied had inspection, monitoring and control mechanisms, but 51,4 % of these mechanisms belonged to the municipal or Departmental Secretariat of Health. 70,3 % of the municipalities reported that there was quality control regarding programme activities and 67,6 % of them were running supervision activities (Figure 3).

*Financing.* All the Departments and municipalities were operating financing schemes prior to Law 715, 2001 being passed. Those resources applied to the VBD programme formed part of the municipal health budget, whose main sources in 2001 were as follows: transfers of current income from the State (*ingresos corrientes de la Nación – ICN*), the fiscal allocation and resources from the Solidarity and Insurance Fund (Fosyga). These resources represented a little over 60 % of the total health budget. Another 30 % came from Departmental contributions and the sale of Level I Hospital services.<sup>1</sup> Some of the resources were partially managed by the Departments in close to half of the municipalities from the two groups.

Most Departments and municipalities considered that the aforementioned resources were insufficient and that payments were made late. They frequently found that there was not enough clarity in allocating and managing those resources destined for the VBD programme. Not one of the municipalities had any sort of system of public accountability.

*Personnel.* Heads of VBD programmes in the Departments had a professional qualification and 75 % of them had some type of postgraduate degree. VBD programme heads (or those in charge assuming the management of other programmes) in medium-sized and some cities had had professional training, but only 25 % to 30 % of them had managed to study for a postgraduate degree. 26 out of the 28 municipalities in the study group had one or more professionals in management posts; a third of them had up to two years' seniority and another third had 20 years or more seniority. Technicians participated in management posts in 10 out of the 28 municipalities (35,7 %), especially in the smallest ones, most of them having up to five years' seniority.

---

<sup>1</sup> Basic hospital services (on a national scale of 1-4).

15 out of the 28 municipalities (53,6 %) had at least one professional in the post of programme coordination; in 10 of the municipalities (35,7 %) they had up to 1 year's seniority. They had 5 or more years' seniority in just 4 municipalities (14,3 %).

Most interviews highlighted the following aspects: personnel in charge of the programmes did not have sufficient technical, administrative and analytical abilities for planning and managing based on objectives and for performing as managers. Salaries were not appropriate and there were no financial and/or non-financial incentive systems. Personnel administration was thus not professional but rather authoritarian, promotions were not made based on merit and/or performance and they frequently became political ingredients. Corruption in contracting and recruiting personnel was common.

*Training.* Training activities were only carried out in 9 out of the 28 municipalities (32,1 %) in the study group and 2 out of the 5 municipalities (40 %) in the control group during 2001-2002. There was a lack of shared training processes for VBD programme personnel or any having a common/heterogeneous purpose.

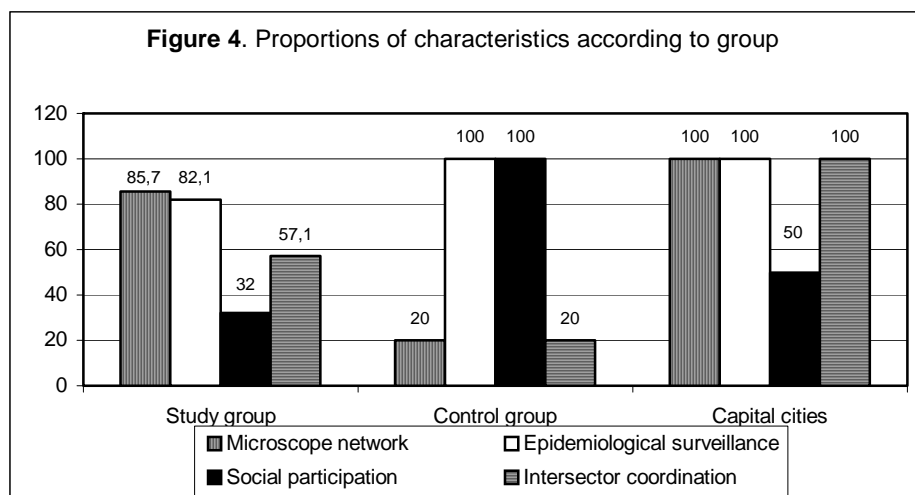
*Operational personnel base and activities.* 97,2 % of the operational personnel stayed in the main towns, operating according to a programme of visits or as a response to emergency situations. On the other hand, 21,6 % of such personnel were carrying out activities different to just that of malaria, but within the framework of the VBD programme.

*Consumer items.* Providing medicine, insecticides and mosquito netting was generally late and insufficient.

*Networks.* It was found that the microscope network was relatively well developed in the municipalities in the study group, since 85,7 % of them had it (Figure 4). The same thing did not happen with other networks required for managing malaria, especially in entomology.

*Monitoring and information system.* In spite of it being considered that capturing cases of malaria was deficient, more than 80% of the municipalities had an epidemiological monitoring system and it was considered that the information was reliable (Figure 4). At the same time, everyone had received support for training; however, only 35,1 % considered that this had been a good opportunity and that feedback from the information had been useful. The information system lacked integration and had very little technological development. It also lacked systematic information regarding the efficacy of

chemical and biological control activities. At the same time, an important discrepancy became presented between the information regarding cases managed in the municipalities and that used by the Ministry of Health.



*Social participation.* A precarious level of social participation was observed, this being one of the malaria control programmes’ notable weaknesses. Regarding this aspect, differences between study and control groups became significant. Only 32 % of study group municipalities had some type of participation social, whilst the control group had 100 % (Figure 4).

*Interaction and coordination.* It was generally found that there were no political frameworks allowing goals for coordinated action to become defined amongst the municipalities. Vertical and horizontal interaction amongst VBD programmes, like the public sector, was consequently weak. Intersector coordination with other programmes reached 54,1 % in all municipalities, indicating that this tool is not used properly, giving little opportunity for making other sectors become aware (Figure 4).

*Programme dynamics.* The perception predominated that the VBD programme had become weakened from 1997 to 2001, except in the capital cities (Figure 5). Difficulties were recognised in both the study and control groups, especially regarding financing, organisation, personnel, logistics and technical capacity (Table 1).

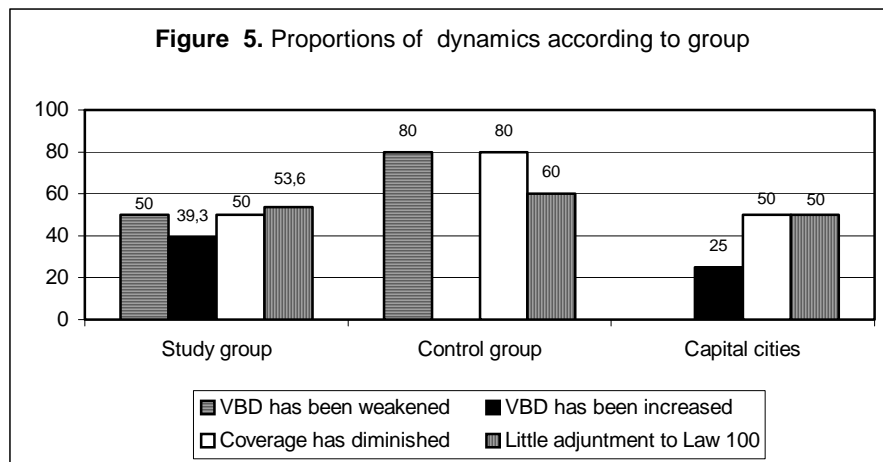
*VBD coverage.* 50 % or more of municipalities from the three groups stated that programme coverage had diminished during 1995-2001 (Figure 5).

*Adapting the VBD-malaria programme to the scheme laid down in Law 100 and decentralisation.* It was found that 56,7 % of the total had adapted their approach very little or not at all to those schemes laid down in Law 100 and decentralisation (Figure 5). This suggests that if important transformations had been made to the VBD programme, these had still not been adequately adopted to the scheme of organisation and operation laid down in Law 100.

**Table 1.** Difficulties regarding the programme

The main difficulties were found in	Study group		Control group		Capitals		Total	
	N	% *	N	% *	N	% *	N	% *
Organisation	22	(78,6)	0		2	(50)	24	(64,9)
Financing	25	(89,3)	5	(100)	0		30	(81,1)
Personnel	25	(89,3)	5	(100)	2	(50)	32	(86,5)
Logistics	22	(78,6)	4	(80)	1	(25)	27	(73)
Technical capacity	22	(78,6)	4	(80)	1	(25)	27	(73)
Total	28		5		4		37	

\* The percentage respecting the total of each group is shown in parenthesis



*Relationship between variables.* Bivariable analysis (variable to variable, Kruskal-Wallis test) indicated the existence of some associations ( $p < 0.002$ ), as shown below. Two types of grouping were systematically made; on the one hand, the lack of adapting to Law 100, the weakening of the programme and declining coverage were related to the programme's lack of differentiation and also to supervision of activities, the existence of a monitoring system and the absence of social participation. On the other hand, greater adapting to

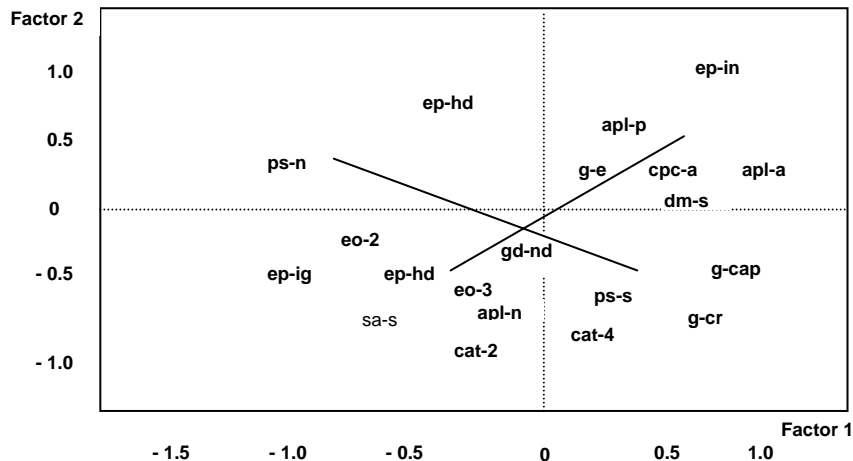


Law 100 was associated with decentralisation and greater capacity for providing coverage. The former suggests that it is possible to find VBD programmes where epidemiological monitoring and supervision activities are being undertaken, in spite of weaknesses and lack of coverage.

Multivariable analysis (multiple correspondence) showed that it was possible to coordinate and simplify the system of relationships, giving new significance to those, which had previously been identified in bivariable analysis. Taking municipal development as a parameter, four areas of results were identified in terms of those variables-categories with which each one was most associated.

Study group municipalities were associated with adapting to Law 100 (little or acceptable), apl-p and apl-a, decentralisation (dm-s), as well as having increased the programme (ep-in) and having the capacity to provide acceptable coverage (cpc-a), but were independent respecting organisational structure and programme differentiation. Another delimited area corresponded to those municipalities which had not adapted to Law 100 (apl-n), with intermediate or more complex organisational structure (eo-2, eo-3), in which the programme had stayed the same or had become weakened (ep-ig; ep-hd), were undifferentiated (gd-nd) but had supervision of activities (sa-s) and were independent of decentralisation. Category 2 municipalities (cat-2) were most associated in this area (i.e. capital and intermediate cities).

**Figure 6.** Processes of transformation and effects regarding the VBD programme



Control and capital groups (g-cr; g-cap) tended to be associated with some study group municipalities (cat-4), in terms of social participation (ps-s). A set of them had no social participation (ps-n), the programme had become weakened (ep-hd) and did not have supervision of activities.

*Insuring entities – SRAs and HPEs (Administradoras del Regime Subsidiado - ARS, Empresas Promotoras de Salud - EPS).* 15 surveys were carried out, 13 (86,7 %) with SRAs and 2 (13,3 %) with con HPEs. Out of the total 5 were public and 10 private. The main variables' frequencies are given below.

- Payment for activities regarding managing complicated malaria: 12 (80 %) totally paid and 1 (6,7 %) partially paid;
- Specific resources for diagnosing and treating the involved population: 10 (66,7 %) had no resources; only 2 (13,3 %) showed that they had them;
- Reports regarding malaria: 10 (66,7 %) had not presented a report or had not supplied information; 5 (33,7 %) presented two or more reports during the year to Departmental or local Secretariats of Health; and
- Participation: only 6 insuring entities (40 %) participated in some aspect of designing the local Basic Attention Plan, especially in diagnosis and monitoring (26,7 %).

*Service-providing entities - SPEs (Prestadores de Servicios – IPS).* 20 surveys were carried out with service-providing institutions: 16 (80 %) in the study group, 2 (10 %) in the control group and 2 in the capitals. Out of the total, 11 (55 %) were hospitals or clinics; 16 (80 %) were public and 4 private.

The main frequencies indicated that:

- Levels: 13 (68,4 %) from level I, 5 (25 %) from level II and 1 (5 %) from level III;
- Users Association: these were found in 10 (50 %) IPS;
- Resources for individual promotion and prevention: 7 (35 %) had such a resource;
- Reports: 10 (50 %) IPS presented 12 reports or more per year about malaria, most were sent to the Departmental Secretariat of health;
- Medicine: 5 (25 %) manifest that the supply of medicine was appropriate. Out of the total of those IPS receiving medicine, 17 (85 %) received from the Ministry of Health, via the Department or municipality; and
- Only 10 (50 %) IPS participated in drawing up the BAP, especially in diagnosing and designing it.

*Extended immunisation programme - EIP vs. VBD Programme.* Secretariat of Health SPEs carried out vaccination in 22 out of the 28 study group municipalities; at least 11 of the 28 municipalities had carried out vaccination campaigns during 2002-2003. Likewise, the municipalities, except for supplying the vaccines, mostly did those activities forming part of the vaccination programme. The latter and more than 85 % of the EIP programmes depended on financing from the Ministry of Health, but also used Departmental resources.

The same as in the case of the VBD programme, the perception that this had become weakened predominated in the EIP programme too (Table 2), being even more accentuate in the study group. The main difficulties were related to aspects regarding financing, decentralisation, logistics, technical capacity and personnel.

**Table 2.** Programme dynamics and difficulties

EIP programme dynamics	Study group		Control group		Capitals		Total	
	N	%	N	%	N	%	N	%
The programme became weakened 1997-2001	25	(89,3)	5	(20)	1	(25)	31	(83,8)
The programme has increased 1997-2001	2	(7,1)	0		1	(25)	3	(8,1)
Total	28		5		4		37	

The main difficulties were found in	Study group		Control group		Capitals		Total	
	N	%	N	%	N	%	N	%
Decentralisation	25	(89,3)	0		4	(100)	29	(78,4)
Financing	25	(89,3)	1	(20)	1	(25)	27	(73)
Personnel	21	(75)	4	(80)	1	(25)	26	(70,3)
Logistics	24	(85,7)	2	(40)	3	(75)	29	(78,4)
Technical capacity	16	(78,6)	1	(20)	1	(25)	18	(48,7)
Total	28		5		4		37	

The percentage respecting the total of each group is shown in parenthesis

More than 80 % of the municipalities in both groups estimated that coverage had diminished or stayed the same during 1995-2001. On the other hand, no less than 75 % of the EIP programmes had managed to become adapted to the scheme laid down in Law 100 and current capacity for providing an acceptable or total response was high, except in the logistics.

The Student t test was used for comparing the replies obtained in the VBD and EIP surveys, applied to summing the proportions from the study groups and the capitals in each type of survey (gl=62). Significant differences were

found in the EIP programme ( $p \leq 0.02$ ), mainly regarding the “weakening of the programme” and the “acceptable and total capacity for providing coverage” options; the VBD programme presented the greatest proportion of significant difference in the “programme has become increased” option.

#### Comparison and balance

As has been stated, both the control programme prior to 1993, at least in its final phase, and the programme following 1993 presented low efficacy respecting growing tendencies and new problems regarding malaria.

The information obtained, complemented by secondary information (69-72,75-80), led to key malaria control programme characteristics being identified, as shown in Table 3.

The balance between the two programmes puts those aspects conserved from the prior programme and gains from the VBD programme into relief:

- Aspects persisting from the prior programme, in the new conditions pertaining to the relationship between the Ministry of Health and Departmental and municipal Health Services: providing consumer goods, especially medicine. Likewise, providing consumer goods continues to be insufficient and hardly opportune.

- Aspects relating to gains from the control programme post 1993: resources have increased but they are perceived to be less even applied due to their dispersion throughout many Departments and municipalities having relative autonomy; there has been a rapid deterioration of conditions which have led to increased morbidity; the diversity of actors, but these having little commitment to the programmes; the concurrence of many sources of financing for the programmes; budgetary control by Departments and municipalities.

*Gaps in the current programme.* The following are considered to be gaps in the programme prior to 1993.

Positive aspects of that programme which have not been incorporated into the VBD programme:

- Normative dimension: its own specific normative frameworks;
- Planning: ecological coordination according to a regional overview, the experience and capacity for formulating regional and Departmental plans;

- Personnel: the volume and stability of personnel according to perceived needs; motivation of and incentives for personnel;
- Managerial capacity: countrywide or regional management capacity and global evaluation; control of resources; the system of information regarding malaria, within the framework of the National Health System information system;
- Training: elaborating partial plans;
- Strong institutional structures; and
- Systematic community interventions.

**Table 3.** Control programme characteristics compared

Item	Before 1993	1993–2002
Institutional agent	Ministry of Health MES SDCAU	Ministry of Health Departments Municipalities
Planning	Central and normative	Central and indicative, decentralised
Financing	Central and sole source	Several sources: central, transfers, own Departmental and municipal resources and CHP <sup>2</sup> contributions
Personnel	Centrally contracted by the Programme. Volunteers in communities	Contracted at Departmental and municipal level, according to decentralisation. Contracted by HPEs-SRAs in SPE programmes
Consumer goods	Centrally acquired and distributed	Centrally acquired and distributed by Departments and municipalities according to decentralisation
Monitoring	System of registering and notifying cases	Monitoring system (epidemiological, entomological, etc.) Sentry posts and Departmental Laboratory Network
Organisation	National and vertical structure	Departmental and municipal structure according to municipal development and decentralisation
Operation	By commission, i.e. through campaigns	By commission, according to epidemiological needs
Hierarchical dependence	Ministry of Health and MES or SDCAU having wide autonomy	Concentration of functions regarding providing resources and supplies by the Ministry and the NHI <sup>3</sup>
Integration system	Regionalisation of Colombia; weak health service coordination with Primary Attention policy	According to territorial entities. Coordination with Departmental and municipal health Secretariats and partially with the providers' network
International- institutional/ intersectorial coordination	Non-existent	Weak and sporadic
Inspection, monitoring and control	Auto evaluation	Users' Associations, ombudsmen, the Comptroller's office, the Attorney General's office, the Public Prosecutor's office, Departmental and municipal offices, the Superintendent of

<sup>2</sup> Compulsory Health Plan<sup>3</sup> INS – *Instituto Nacional de Salud*

Technical assistance	Training and improvement within the programme	Health's office Dispersion, little development of local and Departmental Offices
----------------------	---	---

Potential gains from the new programme which have not been implemented:

- Planning and supervising activities and analysing achievements;
- Continuity in the planning process;
- Capacity for providing the programmes with Technical Assistance;
- Flexible and integral management of new strategies and activities;
- Prepared personnel having sufficient training in managerial and administrative aspects;
- Sufficient and continuous training of personnel, with appropriate remuneration;
- Managing personnel based on merit and transparent management;
- Using the BAP as a tool for activities, research and coordination;
- Appropriate and continuous control of resources;
- Positive transformation of the effects of how policy is made; and
- Appropriate availability of entomologists; continuous control efforts being made.

## 2. Decentralisation, territorial models and health system reform

Decentralisation has been a slow, constant, long-term process in Colombia since 1986, modelled by Law 12 in 1986, 60 in 1993 and 715 in 2001. The last two established and improved the system of transferring resources between the Nation, Departments and municipalities, serving as the basis for decentralisation. Law 10, 1990 felt the way forward for decentralisation in the health sector and introduced some institutional changes in it. Law 100 in 1993 fully reformed the health system and created the GSSHs.

Political and administrative decentralisation of the municipalities is still far from being finished. Only 522 municipalities (49 % of the total) had managed to obtain the necessary certification for them to become decentralised in 2001; the degree to which these municipalities have fulfilled the requirements for obtaining such certification has not been homogeneous (68). Decentralisation and reform thus represent the two general and political frameworks having an effect on all health programmes, including VBD control (69-71).

Pacific Coast Department and municipal experience constitutes a special and specific case, since VBD control programmes have followed their own route towards decentralisation.

In the Departments dealt with in this study, the Institute of Health in the Nariño Department, based in Pasto, has a VBD Control Unit in Tumaco, its second city, managing the programme for 10 endemic municipalities. The Department is decentralised, as are some municipalities but in that related to the VBD programme they depend on the Tumaco Unit.

The Cauca Department is decentralised but a good part of the municipalities are not; the VBD programme is centralised at Departmental level, operating like this with the malarial municipalities.

Former MES personnel in the Valle del Cauca were appointed to a Decentralised Departmental Institute assuming responsibility for the VBD programme in 42 municipalities. This Institute has the same hierarchical level as that of the Secretariat of Health, but this is an operational unit which in turn centralises the VBD programme in an appreciable number of municipalities, in spite of some of them being already decentralised.

The Chocó Department is decentralised but the municipalities are not and the VBD programme is centralised at Departmental level, operating like this with its malarial municipalities.

This type of incomplete but stable decentralisation, in the midst of general processes related to administrative political decentralisation, has provided space for relationships leading to advantages for some actors; from the technical point of view it allows more centred managing of those critical problems which municipalities are not able to confront on their own. But the problems inherent in this decentralisation scheme are soon evident; the regional or departmental unit assumes responsibility for the control programme and the municipalities do not carry out activities or assign resources. From a political point of view, this is a scheme allowing dominant political parties' lines of clientelist action to use the State's departmental and municipal apparatus, as well as its public institutions.

The achievements and problems of the GSSHS have an effect on all of the system's dimensions, including the VBD programme. Amongst the former, it is worth mentioning the increase in insurance and spending on health, the consolidation of contributions and fiscal resources as sources of financing, the vertical, horizontal and regional solidarity, the increase of subsidies to the

poor and the broad package of services. On the other hand, some problems can be highlighted: the insufficient level of affiliation (72), the inefficacy in spending, the increase in expenses, inappropriate flows of resources, inadequate and insufficient identification and affiliation of poor people, segmentation of the population and weak stewardship/management.

### 3. Actors' perceptions

Other dimensions of VBD programme characteristics and problems have to do with each actor's perceptions of themselves and the other actors, within the framework of the health system. Their perceptions are given below (Table 4).

### 4. Control model

A large part of the fundamental elements of the model for malaria control that we are proposing have already been presented (structural basis and malarial tendencies, the programme's current problems, etc.). Likewise, those challenges and values found in the National Malaria Control Plan (*Plan Nacional de Control de la Malaria* - PNCM) were considered when designing the model in terms of objectives, goals and strategies (eliminating transmission, diminishing morbidity, avoiding mortality and complications and preventing the appearance of outbreaks of malaria). Similarly, the transformation of the political and institutional context leading to having an effect on programme control should be pointed out; the Ministry of Health was recently merged with the Ministry of Work and social Security, forming the Ministry of Social Protection, generating extensive reorganisation and relocation of functions and dependencies.

The modelling exercise required the following aspects of the model for the control of malaria to be taken into account:

- Principles underlying the new control model programme: a set of key capacities must be included having a significant effect on programmes having different degrees and level of development;
- Approach: comprehensive, seeking to compensate or equilibrate coverage and quality; and
- Purposes and objectives: for contributing towards reducing and preventing mortality and morbidity, controlling transmission and avoiding epidemic outbreaks, the model has the following objectives:



- Augmenting malaria programme control management capacity (building management capacity) at municipal and Departmental level;
- Improving control activity quality and scope (prevention, treatment and monitoring) in the municipalities and Departments;

**Table 4. Actors’ perceptions**

Actors	Main perceptions
Departmental and municipal authorities	<p>Department-municipal relationships: For the Departments, the relationship with uncertified municipalities is conflictive. BAP resources are distributed in an attempt to support activities in the municipalities. The municipalities receive resources via Departments or via hospitals, even though not being decentralised. They want to manage the Departments’ malaria programme personnel but that they pay them. They accuse the Departments of keeping part of those resources destined for municipal BAPs, which are invested in departmental capital. They think that there is little accompaniment when they are in difficulties, but seek Departments’ financial and operational aid to carry out activities such as fumigation, diagnosis, microscopy etc.</p> <p>Access: There are important difficulties regarding geographical and economic access due to poverty, lack of means of communication, means of transport and their cost. Insufficiencies in affiliation to the health system are more notorious in poorer populations. At the same time, available personnel and resources do not allow complete coverage to become achieved. The displaced and undocumented population that is very difficult to deal with represents another growing problem.</p> <p>Payment for services The HPEs and SRAs do not recognise, or significantly delay, payment for activities in diagnosing and treating malaria, leading to using up municipal resources earmarked for other things.</p>
Insuring entities: HPEs and SRAs (EPS-ARS)	<p>They are carrying out their function properly. They maintain that delays in payments to SPEs are due to the Secretariats of Health not transferring subsidised regime resources or those from affiliates on time. They do not think it viable or obligatory to pay institutions or people different to hospitals and Secretariats for diagnosis and treatment activities, since they do not have any juridical or accounting back-up.</p>
Service-providing entities – SPEs (IPS)	<p>They are limiting their assigned role in terms of diagnosing and treating complicated cases. They are facing limitations in terms of resources for prevention and promotion, as well as medicines. On the other hand, SRAs and HPEs delay making payments.</p>
Community (heterogeneity of organisms)	<p>Community organisations are always disposed towards supporting activities, which they have convoked. They do not have any control, evaluation or planning functions. When they are not convoked towards action, their activity is limited to transmitting citizens and</p>

---

NGOs	groups' complaints or to presenting requests for help with social and health work, which (it must be said) are not usually dealt with. These entities centre their activities on controlling or helping with VBD programmes activities. These would include health education, risk detection and prevention, mosquito-netting use, diagnosis and treatment, training leaders, helping mayors, VBD programmes, transferring the very sick and research.
------	--

---

- Criteria and viability: these have been conceived as being a realizable challenge, between the optimal and the desirable, in a complex institutional and social setting within the current normative framework, without which processes should be undertaken for modifying or producing Laws and Decrees. Simpler normative transformations could be necessary (i.e. Ministry Resolutions or Assembly and Council decisions);

- Scope: applicable at departmental and municipal level; and

- Parameters: the model's parameters are strengthening human talent, institutional adjustment and normative development (organisation, planning, infrastructure, supplies, etc.).

The control model's components are synthetically shown in Table 5, in terms of those capacities and aspects of normative adjustment and institutional development that should be acquired.

## DISCUSSION

The predominating approach of managing malaria as a public health problem is centred on activities (diagnosis, treatment, insecticides, mosquito nettings, education, etc.). This approach has contributed much knowledge regarding malaria, as well as some recent successes (73-75). When a method or activity whose efficacy has been proved does not give the expected results, then the difficulties are attributed to isolated factors of control programme organisation and operation (administration, financing, personnel, etc.) or uncontrollable processes within the context (5,33,76,77).

Health system reform and decentralisation processes and the growing negative effects of terminating the former National Health System weakened public health programmes in Colombia (69-71). Taken together, they suggest that it is not enough to have good methods for confronting malaria or controlling its effects on the population, but rather others requiring examining the organisation entrusted with such methods.

This study was focused on the institution entrusted with the malaria control programme; this institution is part of a health system (a set of interacting elements), operating as a service (generating products for a population). Its dynamics and problems can be considered from several theoretical approaches: systemic development (78), agency roles and stewardship (79-82). The agency is orientated towards control programmes regarding service users. Stewardship provides a normative framework guided by ethics; such approach allows proposing a broader methodology for approaching malaria control programmes, from which the context and activities can be observed.

Some studies have been carried out at international level concerning adapting malaria control programmes to local conditions, from the Garki project's pioneering studies (83), especially as case studies (84). Most studies in Colombia have been concentrated on the characteristics of the malaria problem and transmission and programmes and activities (38-55). Some of them have occupied themselves with factors regarding the social, economic, political and cultural structures which have had deeply effected malarial tendencies in our country. Less interest has been provoked by evaluating the effects of transformations in agrarian production systems, spontaneous and forced migrations, colonisation (85), growing coca crops and the political confrontation, corruption and clientelism which have provided greater or lesser impetus than decentralisation and State reform.

The tendencies and the situation of malaria in the population thus depend on the complex interaction of factors conditioning the intensity of transmission, the frequency of the disease, its forms of manifestation and its epidemiological characteristics. Reconstructing malaria's long-term tendencies led to finding that there was an early increase in morbidity in the 1980s (86). New social, political and cultural processes became combined during this period that then became added to decentralisation and even later on to reform. The MES and SDCAU effectively contributed towards reducing mortality for more than 20 years, but then they became exceeded by structural efforts and processes governing malaria. The same thing happened again with VBD programmes put together during the process of decentralisation and reform, which weakened public health. In this sense, findings from two recent studies (5,33) suggest that there is limited access to diagnosis and treatment, the disassociation of qualified personnel has left responsibility for the programme in the hands of untrained personnel and broken up the public network. Likewise, if decentralisation's long-term scheme for transferring resources has contributed towards improving equity in regional allocation (87), the same has not happened with allocating subsidies to the regions according to their Unsatisfied Basic Needs (UBN), whose distribution is widely inequitable

(14-16,88). Other Concurring problems are affecting the health system: insufficient affiliation, many stages and delays in designing resources as subsidies, insuring entities' inappropriate management, inequalities in contracting and the absence of monitoring and control mechanisms from dominating positions and little social participation (88). VBD programmes thus found themselves amidst multiple pressures originating from economic, socio-political, decentralisation and health system reform processes. In this respect, some studies have indicated that those processes affecting the context of public institutions also have an effect on their organisation, administration, human resources and financial management (89-93).

Characterising the current malaria control programme's characteristics and problems has led to identifying its profile. This type of programme is mainly public in Colombia: SPE managed, financed and curative services. They have little degree of administrative development and lack training plans; many personnel have a low degree of scholastic preparation and have recently become involved with such programmes, lacking incentives and remuneration is low. There are insufficient consumer products and these are late in being delivered. The programmes operate mainly through visits to municipalities. There is little social participation and other social, institutional and civil sectors are not coordinated. Insuring entities are mainly private but apart from the Secretariats of Health (respecting the VBD) and they have no affect on drawing up the BAPs.

Comparing the VBD programme with the EIP suggests that they have experienced similar effects in decentralisation and reform; however, the processes have been different. The VBD programme tries (without success to date) to ensure that insures and providers appropriately comply with their roles and apply the CHP. Vaccination campaigns were progressively abandoned by the Secretariats of Health after 1997 in the EIP and the programme became assumed by the HPE-SRA insuring entities and the SPEs, leading to a rapid fall in vaccination and the level of effective protection. The later return to the scheme of campaigns, in conditions of more advanced decentralisation, retained the SPEs as vaccination agents and recovering the role of the Secretariats of Health, improving the level infant vaccination.

In view of the above, the exercise of VBD malaria programme institutional modelling was carried out with sufficient foundation, dealing with those gaps identified and aiming at the objectives proposed in national malaria control policy. The model is centred on capacities, normative adjustments and institutional development. This model allows the organisation, planning methodologies, resource allocation and managing personnel having

multiple abilities to become progressively transformed (94). It likewise leads to institutions outside the health sector and the private sector to become involved in malaria control activities (95,96). Just like the institutions, malaria control programmes must become up-dated and adapted, acquiring the capacity to operate in adverse conditions.

The study had a set of limitations. In terms of control programmes, it represents the territorial (Department) centralised or partially decentralised scheme. It does not have a VBD programme corresponding to a completely decentralised territorial scheme. On the other hand, it is based on the malarial, ecological and epidemiological type, predominating on the Pacific Coast, meaning that as other regions share it then it is not the only one in the country. The weakness of Departmental and municipal health information systems restricts any reliable information that can be used •

**Acknowledgements.** This paper was made possible through support provided by the Alliance for Health Policy and Systems Research (AHPSR) and the World Health Organisation. We would like to thank Miguel González-Block and Indra Pathmanathan (AHPSR Manager and consultant) for their methodological help. We would also like to thank Carolina Suárez, Adrián Muñoz and Diony Pulido for their direct help with the field-work and the innumerable functionaries from the Departmental and municipal Mayors' offices and Secretariats of Health, from the SPEs (IPS), SRAs (ARS) and HPEs (EPS), from the community and from NGOs for their collaboration which made it possible to obtain all the information used in this study.

**Table 5.** Components of a new malaria control model

Components	Capacities	Normative adjustment and institutional development
Organisation	<ul style="list-style-type: none"> <li>- Attitude towards and ability to use methods which will be shared and generate commitment based on institutional communication, without which formulating organisational goals and exercising authority would become impeded.</li> <li>- Generating a view aimed at dividing work within the organisation clearly assigning specific functions to jobs, supported by function manuals. These functions should incorporate the set of relationships, support and follow-up for malarial municipalities in organisation at Departmental level.</li> </ul>	<ul style="list-style-type: none"> <li>- A normative framework providing a defined profile such as the VBD or malaria programme.</li> <li>- Departmental and municipal functions Manual.</li> <li>- Implanting strategic, participative planning methods involving the willingness to be open to making suggestions for change.</li> </ul>
Planning –decision-making	<ul style="list-style-type: none"> <li>- Situational location of morbidity and mortality at local levels, based on analysing: Population characteristics</li> <li>Processes of structuring territories: production systems and socioeconomic analysis; State and politics/policy;</li> <li>Regional cultural profile; Epidemiological stratification of risks (transmission determinants and conditions, morbidity and mortality, priority areas, selective control of vectors, access to services, urban malaria, etc.).</li> <li>- Priority-based decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>Normative and methodological guide for the planning and decision-making process allowing:</li> <li>Identifying the population’s specific needs</li> <li>Dimensioning the institution, its capacities and equipment and required supplies</li> <li>Establishing priorities</li> <li>Programming activities from a medium-term viewpoint, involving horizontal institutional and social participation</li> </ul>
Financing	<ul style="list-style-type: none"> <li>- Mobilising resources: tight control in the resource allocation programme based on budgets, plans and results.</li> <li>- Financial management of resources in the CHP and BAP, based on schemes for controlling spending and appropriate and opportune information.</li> <li>- Managing resources and cofinancing in municipi-</li> </ul>	<ul style="list-style-type: none"> <li>Institutional design of VBD financial flows, including horizontal cooperation/follow-up relationships with financial aspects with both insuring entities and secretariats of health and municipal mayors’ offices</li> <li>Designing methodologies and instruments for</li> </ul>

	palities having regionalised or non-decentralised control programmes	achieving institutional transparency and practising public accountability (i.e. presenting balances to social organisms and social security councils)
Infrastructure, technical capacity and operation management	- Giving and receiving technical assistance according to a minimal technical and operational training plan, regarding the programme's objectives and priorities	Generating a continuous process of technical assistance for municipalities at Departmental level
Human resources	- Training: Training directors and managers to have planning and managing abilities with objectives, a notion of collegiality, participation in decision-making, financial management, managing change and leadership qualities. Quality of performance of operators or those responsible for control activities (selective control of vectors, diagnosis, treatment, resistance, epidemiological and entomological monitoring and resistance to medicines and insecticides) Designing projects for the BAP, including appropriate remuneration for volunteer workers still working in the communities Planning resources and activities based on population diagnosis, objectives and priorities: supervising activities Designing stimulus or economic and non- economic incentive systems and methods (equity, participation and flexibility in allocating work, participation in decisions regarding organisation, open and competitive recruiting procedures, reasonable wages, promotion based on performance, effective use of resources and suitable physical setting and equipment) Training technicians for environmental	Designing a concerted Departmental and municipal training plan, supported by NGOs, educational institutions, the Ministry of Social Protection and other state and private institutions

	sanitation Training community agents	
Communication	Commitment, support, participation, broadcasting successful experience an empowerment	Strengthening the communication component in Departmental and municipal BAPs
GSSHS	<p>Making malaria control a priority at municipal and Departmental level and negotiating policy regarding insurance for achieving significantly wider coverage</p> <p>Designing models for appropriate SPE-HPE-SRA contracting</p> <p>Including in the Basic Attention Plan aspects such as: guaranteeing billing for diagnosing malaria, acquiring medicines with Ministry help and distributing them to the SPEs, evaluating and controlling consumption, entomological monitoring and institutional strengthening of Departmental and municipal groups and vector control</p> <p>Designing, implementing and evaluating alternatives for providing services with the SPEs, SRAs and SPEs, billing services provided by Departmental Secretariats and Local Health Offices, especially in conflict areas and regions having indigenous communities</p>	<p>Forming a priority parameter regarding cooperation and consultation (Ministry of Social Protection, Departmental and municipal Secretariats) for establishing appropriate norms and procedures in contracting, billing and providing services, facilitating broadening attention coverage and quality</p> <p>Coordinating insuring entities in designing the BAP</p>
Networks and relationships	<p>Formulating proposals and projects for different sectors and institutions responsible for ensuring adequate management of the environment, public and private investment and development projects, education respecting ethnic groups</p> <p>Proposing and managing political frameworks indicating goals for coordinated action and facilitating shared training processes for personnel from different organisations having common purposes</p>	Identifying the set of institutions which can provide positive support for VBD control at departmental level and designing a methodology for constructing networks, applicable in the municipalities



Pilot experience	Locating and organising demonstrative experiences where it is possible to visualise those strategies and methodologies offering most advantages in structuring the programme in the specific areas considered here (organisation, financing, human resources, social participation, etc.)	
Social participation	-Designing specific policy for the municipal setting (objectives, the media, methods and resources) stimulating social participation and some degree of social control over real processes having coordination and self-regulation  -Identifying relevant research problems respecting malaria activities, risk factors and the programme control Communication and dialogue with research institutions Managing cooperative research processes	Creating or strengthening a group or office to be in charge of social participation as being policy of the first order  Stimulating an reasoned attitude of collaboration towards the research processes and those institutions carrying them out
Evaluation	Monitoring activities Evaluation based on the criteria of opportunity and quality, and indicators of: Epidemiological monitoring Situation and health tendencies regarding malaria Coverage Evaluating results in terms of the efficacy of those strategies and activities carried out Evaluating control programme components: structure, personnel, financing, training, and inter-sector coordination/articulation	Designating people being permanently responsible for evaluating processes, results and impacts  Establishing defined dates or workshop days for evaluation, with institutional and social participation, and publicly publishing their results

## REFERENCES

1. Dirección de Campañas Directas. Minsalud Colombia. Informe XV reunión de jefes de zona del Servicio de Erradicación de Malaria Colombia. Bogotá; 1989
2. Ministerio de Salud. Colombia. División de Patologías Tropicales. Propuesta para el control integrado de la malaria dentro del proceso de descentralización a las entidades territoriales. Bogotá; 1992
3. Ministerio de Salud. Colombia. Malaria por Departamentos. Colombia. Muestras examinadas positivas y por especie. 1993-1997.
4. XVTh International congress for tropical medicine and malaria. Abstract Volumen 1. Roll Back Malaria in Colombia. Cartagena; 2000. p. 283.
5. Ministerio de Salud – OPS. Reunión de impulso a la Iniciativa Hacer Retroceder el Paludismo (IHRP) en Colombia. Bogotá; 2000. p. 71.
6. Informe Quincenal Epidemiológico Nacional. Comportamiento de la malaria durante 1999. 30 Septiembre 1999; 4 (18): 274-279.
7. Garay LJ. Globalización y crisis. TM Editores. Colciencias. Bogotá; 1999.
8. Widdus R. Public-private partnerships for health: their main targets, their diversity, and their future directions. Bull. WHO. 2001; 79(8): 713-720.
9. Buse k, Waxman A. Public-private health partnerships: a strategy for WHO. Bull. WHO. 2001;79(8): 748-754.
10. McPake B, Mills A. What can we learn from international comparisons of health systems and health system reform?. Bull. WHO.2000; 78(6): 811-820.
11. Londoño JL, Frenk J. Structured pluralism: towards an innovative model for health system reform in Latin America. Health Policy. 1997; 41:1-36.
12. Fresneda O. El sistema de selección de beneficiarios y el régimen subsidiado de salud en Colombia. Comercio Exterior. 2003; 53(6):574-586.
13. Universidad de Antioquia. Cobertura del seguro de salud en Colombia. Observatorio de la Seguridad Social. 2001; 1:1-11.
14. Londoño J L. Distribución del ingreso durante la transformación estructural. Colombia 1938-1988. Santafé de Bogotá: Tercer Mundo Editores; 1995.
15. Fresneda O. Pobreza, políticas sociales y desarrollo en Colombia. 1972-1993. [Tesis Magister en Economía]. Santafé de Bogotá: Universidad Nacional de Colombia, Facultad de Economía; 1995.
16. Vélez CA. Gasto social y desigualdad. Logros y extravíos. Santafé de Bogotá: Departamento Nacional de Planeación. Misión Social; 1996.
17. Ocampo JA. (Comp.). Historia Económica de Colombia. Cuarta Edición. Santafé de Bogotá: Tercer Mundo Editores. Fedesarrollo; 1994.
18. Cárdenas M. (Coordinador). El crecimiento económico en América Latina. Santafé de Bogotá: Tercer Mundo Editores. Fedesarrollo; 1996.
19. Cárdenas M, Lusting N (Compiladores). Pobreza y desigualdad en América Latina. Santafé de Bogotá: Tercer Mundo Editores; 1999.
20. Corredor C. En busca de una alternativa integral de desarrollo. Santafé de Bogotá: Cinep; 1995.
21. Departamento Nacional de Planeación, Informe de Desarrollo Humano para Colombia 1998. Santafé de Bogotá; 1999.

22. Ocampo JA, Pérez MJ, Tovar CE, Lasso FJ. Macroeconomía, ajuste estructural y equidad. 1978-1996. En: Sánchez F (Comp.). La Distribución del Ingreso en Colombia. Santafé de Bogotá: Tercer Mundo Editores, Departamento Nacional de Planeación; 1998. p. 51.
23. Selowsky M. Who benefits from government expenditures? A case study of Colombia. New York: Oxford University Press-Banco Mundial; 1979.
24. Banco Mundial. La Pobreza en Colombia. Bogotá: Tercer Mundo Editores; 1996.
25. Sánchez F (Comp.). La Distribución del Ingreso en Colombia. Santafé de Bogotá: Tercer Mundo Editores, Departamento Nacional de Planeación; 1998.
26. Giedion U, Morales LG. Focalización de subsidios públicos para la salud en Colombia. Un caso didáctico preparado para el curso sobre la reforma y financiamiento sustentable del sector Salud. 1999; 105-117.
27. Paredes N. Plan Obligatorio de Salud (POS) de la seguridad social en Colombia. Un caso didáctico preparado para el curso sobre la reforma y financiamiento sustentable del sector Salud. 1999; 228-244
28. Agudelo C. Sistema de salud y plan de desarrollo: cobertura y equidad. Rev. salud pública. 1999; 1(2):117-127.
29. Céspedes JE, Jaramillo I, Martínez R, Olaya S, Reynales J, Uribe C, Castaño R, Garzón E, Almeida C, Travassos C, Basto F, Angarita J. Efectos de la reforma de la seguridad social en salud en Colombia sobre la equidad en el acceso y la utilización de servicios de salud. Sistema de salud y plan de desarrollo: cobertura y equidad. Rev. salud pública. 2000; 2(2):145-164.
30. Málaga H. Perspectivas de la epidemiología en la reforma de la seguridad social. Rev. salud pública. 1999; 1(2):128-136.
31. Málaga H, Latorre MC, Cárdenas J, Montiel H, Sampson C, de Tabora MC, Granados R, Pastor D. Equidad en la reforma en salud en Colombia. Rev. salud pública. 2000; 2(3):193-219.
32. Martínez P, Rodríguez L, Agudelo C. Equidad en la política de Reforma del Sistema de Salud. Rev. salud pública. 2001; 3(1):13-39.
33. Kroeger A, Ordóñez-González J, Ávila AI. Malaria control reinvented: health sector reform and strategy development in Colombia. Tropical medicine and International Health. 2002; 7(5): 450-458.
34. Zeigler BP. Theory of modeling and simulation. Jhon Wiley & Sons, Inc., New York, N.Y.; 1976.
35. Henriksen E, Selander G, Rosenqvist U. Can we bridge the gap between goals and practice through a common vision? A study if politicians and managers' understanding of the provisions of elderly care services. Health Policy. 2003; 65(2):129-137.
36. Glaser BG, Strauss AL. The discovery of grounded theory: strategies for qualitative research. Chicago: Aldine; 1967.
37. Morse JM, Field PA. Qualitative research methods for health professionals. 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage; 1995.
38. Franco S, Blair S, Valderrama R. Malaria: Economía, cultura y vivienda en Urabá . Medellín;1986.

39. OPS/OMS. Malaria en las Américas: Informe de la 5 Reunión de directores de los servicios nacionales de la erradicación de la malaria y directores generales de salud en la Américas. Washington, D. C.;1988.
40. Ministerio de Salud, OPS, OMS. Memorias de la tercera reunión de investigadores de malaria y otras enfermedades tropicales. Santa Fe de Bogotá; 1991. p. 162.
41. Memorias Seminario Taller Nacional Malaria: descentralización y control. Medellín: Servicio Seccional de Salud de Antioquia; 1991.
42. Informe Quincenal Epidemiológico Nacional. Informe de muertes por malaria en Bogotá y Tunja. 30 Mayo 1998; 3(10):130-132.
43. Informe Quincenal Epidemiológico Nacional. Epidemia de malaria en La Guajira. 30 Julio 2001; 6 (14):30-33.
44. Olano V, Carrasquilla G, Méndez F. Transmisión de la malaria urbana en Buenaventura, Colombia: aspectos entomológicos. Rev. Panam Salud Pública.1997; 1(4): 287-294.
45. Informe Quincenal Epidemiológico Nacional. Situación de la malaria en los Departamentos del pacífico colombiano. 30 Mayo 1998; 3(10):135-139.
46. Informe Quincenal Epidemiológico Nacional. Situación de la malaria en el Pacífico nariñense durante el año 2001. Informe preliminar. 30 Septiembre 2001; 6(18):269-273.
47. Méndez F. Epidemiología de la malaria en el Departamento del Valle 1987-1998. Boletín Epidemiológico del Valle. 1999; 1:11.
48. Informe comportamiento epidemiológico de malaria 2001. Programa enfermedades tropicales. Buenaventura; 2002.
49. Suárez TM, Méndez PF. Análisis de aspectos vectoriales de la malaria en Buenaventura, 1997-1998. Boletín Epidemiológico del Valle; 1999:13-20.
50. Olano V, Carrasquilla G. Transmisión de la malaria urbana en Buenaventura, Colombia: aspectos entomológicos. Rev. Panam. Salud Pública. 1997;(4):287-94.
51. González JM, Olano V, Vergara J, Arévalo H, Carrasquilla G, Herrera S, López J.A. Unstable, low-level transmission of malaria on the Colombian Pacific Coast. *Annals of Tropical Medicine and Parasitology*. 1997; 91(4):349-58.
52. Cuevas H, Ardila CL, Pabón J, Padilla JC, de la Hoz F, Raad J. El niño-oscilación del sur y su relación con la incidencia de malaria en Colombia. Informe Quincenal Epidemiológico Nacional. 1996; 1(3):30-33.
53. Bonilla ME. Evaluación del impacto socioeconómico de la malaria en la Tola. Bogotá: Universidad de los Andes; 1986.
54. Informe Quincenal Epidemiológico Nacional. El Niño-oscilación del sur y su relación con la incidencia de la malaria en Colombia. 15 Diciembre 1996; 1(3):30-33.
55. Ministerio de Salud. Seminarios sobre la participación de los servicios locales de salud en la erradicación de la malaria. Cali; 1967.
56. Ministerio de Salud. Evaluación del programa de malaria: Marco de referencia para el grupo de asesoramiento nacional. Servicio Nacional de Erradicación de la Malaria. Bogotá; 1979.

57. Ministerio de Salud; Servicio Nacional de Erradicación de la Malaria. El programa de malaria en Colombia 1979-1982. Bogotá;1976.
58. Ministerio de Salud. Dirección de Campañas Directas. Servicio de Erradicación de Malaria. Informe de la XV reunión de jefes de zona del servicio de erradicación de malaria de Colombia. Bogotá; 1989.
59. Ministerio de Salud Pública; Servicio Nacional de Erradicación de la Malaria. Plan de erradicación de la malaria.; Ministerio de Salud Pública. Bogotá; 1957.
60. Decreto 2968 de 1956. República de Colombia. Ministerio de Salud Pública.
61. Onori E., Beales PF., Gilles HM. From malaria eradication to malaria control: the past, present and the future. In: Bruce-Chwatt's. Essential malariology. Gilles HM and Warrell DA. Third Edition. Oxford University Press: London; 1995. 267-290.
62. República de Colombia. Ministerio de Salud Pública. SEM. Plan de erradicación de la malaria. Bogotá; 1957.
63. Los Servicios Generales de Salud y la Erradicación de la Malaria. Seminario Cuernavaca. Memorias; 1965.
64. República de Colombia. Ministerio De Salud. Decreto 121 de 1976.
65. República de Colombia. Ministerio de Salud Pública. Decreto N° 2290 de 1978.
66. Ministerio de Salud. Informe de la XV Reunión de Jefes de zona del Servicio de Erradicación de la malaria. Bogotá 13 al 16 de Diciembre de 1988. Bogotá: Dirección de Campañas Directas. Servicio de Erradicación de la malaria; 1988.
67. OPS. Malaria en las Américas. Informe de la V Reunión de Directores de los Servicios Nacionales de Erradicación de la Malaria y Directores Generales de Salud en la Américas. Cuaderno Técnico No.19.
68. Jaramillo IP. Evaluación de la descentralización en salud en Colombia. Informe final. Dirección de Desarrollo Territorial, Departamento Nacional de Planeación. COL/99/022/DNP/PNUD; Bogotá, D.C.; Septiembre 2001.
69. ASSALUD. La descentralización de la salud en Colombia. Bogotá; 2002.
70. ASSALUD. La descentralización de la salud. El caso de tres municipios colombianos. Bogotá; 1998.
71. Silva L, Herrera V, Agudelo C. Promoción, prevención municipalización y aseguramiento en salud, en siete municipios. Rev. Salud Pública. 2002; 4(1):36-58.
72. Martínez F, Robayo G, Valencia O. ¿Porqué no se logra la cobertura universal de la seguridad social en salud? Bogotá: Fundación para la investigación y desarrollo de la salud y la seguridad social-FEDESALUD; 2002.
73. Couto AA, Calvosa VS, Lacerda R, Castro F, Santa Rosa E, Nascimento JM. Control of malaria transmission in a gold-mining area in Amapa State, Brazil, with participation by private enterprise. Cad. Suade Publica. 2001; Jul-Aug; 17(4):897-907.
74. O'Neill K, Bosman A, Teklehaimanot A. Community-based malaria control in Tigray, northern Ethiopia. Parasitologia. 1999; Sept; 41(1-3):367-371.

75. Hung L, de Vries PJ, Giao PT, Nam NV, Binh TQ, Chong MT, Quoc, NNTA, Thanh TN, Hung LN, Kager PA. Control of malaria: a successful experience from Viet Nam. *Bulletin of the World Health Organization*. 2002; 80:660-666.
76. PAHO. Informe sobre la situación de los programas de paludismo en las Américas. *Pan American Journal of Public Health*. 2000; 8:363-367.
77. Schmunis GA, Dias JCP. La reforma del sector salud, descentralización, prevención y control de enfermedades transmitidas por vectores. *Cadernos de Saúde Pública*. 2000; 16 (Supl. 2): 177-183.
78. OPS. *Los Sistemas Locales de Salud*. Washington, D.C.; 1990. Publicación científica 519.
79. Williamson O. *Las instituciones económicas del capitalismo*. FCE. México; 1989.
80. North D. *Instituciones, cambio institucional y comportamiento económico*. Fondo de Cultura Económica. México; 1993.
81. Block P. *Stewardship-choosing service over self-interest*. San Francisco: Berrett-Koehler Publisher; 1993.
82. Saltman RB, Ferroussier-Davis O. The concept of stewardship in health policy. *Bull WHO*. 2000; 78(6):732-739.
83. Molineaux L, Gramiccia G. *The Garki Project*. Ginebra. WHO;1980.
84. Malaria Consortium. [Internet]. <http://www.mosquito.who.int>. Background paper for the fourth RBM Global Partners Meeting 18-19 April 2001, Washington, DC.
85. Singer BH, Caldas de Castro M. Agricultural colonization and malaria on the amazon Frontier. *Annals of the New York Academy Sciences*. 2001; 954:184-222.
86. Agudelo C, Corredor A, Echeverry MC, Salcedo H, Murrain B. Malaria: fundamentos y alcances del control. Características en Colombia. *Infectio*. 1995; 1(1):31-55.
87. Bossert TJ, Larrañaga O, Giedion U, Arbeláez JJ, Bowser DM. Decentralization and equity of resource allocation: evidence from Colombia and Chile. *Bull WHO*.2003; 81(2):95-100.
88. Arévalo D, Martínez F, Rodríguez O. (Ed.) *¿Ha mejorado el acceso en salud?. Evaluación de los procesos del Régimen Subsidiado*. Bogotá: Ministerio de Salud, Universidad Nacional de Colombia; 2002.
89. Brinkerhoff DW, Klaus R. Managerial roles for social development management. *Public Administration and Development*. 1985; 5(2): 145-156.
90. Cassels A, Janovsky K. Management development for primary health care: a framework for analysis. *International Journal of Health Planning and Management*. 1991; 6:109-124.
91. Hilderbrand ME, Grindle MS. *Building sustainable capacity: challenges for the public sector*. Harvard Institute for International Development. Harvard University; 1994.
92. Alwan A, Hornby P. The implications of health sector reform for human resources development. *Bulletin of the World Health Organization*. 2002; 80:56-60.

93. Van Lerberghe W, Conceição V, Damme W, Ferrinho P. When staff is underpaid: dealing with the individual coping strategies of health personnel. *Bulletin of the World Health Organization*. 2002; 80:581-584.
94. Buchan J, Dal Poz MR. Skill mix in the health care workforce: reviewing the evidence. *Bulletin of the World Health Organization*. 2002; 80:575-580.
95. Mills A, Brugha R, Hanson K, Mcpake B. What can be done about the private health sector in low-income countries? *Bulletin of the World Health Organization*. 2002; 80:325-330.
96. Palmer N. The use of private-sector contracts for primary health care: theory evidence and lessons for low-income and middle-income countries. *Bulletin of the World Health Organization*. 2002; 78:325-330.