ADMINISTRATIVE AND OPERATIONAL STRUCTURE OF A NUTRITIONAL EPIDEMIOLOGICAL SURVEILLANCE SYSTEM*

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SUMMARY

Data on the food and nutritional situation of our populations do not permit to obtain a coherent picture in this respect, nor do they allow to evaluate their relation with the nutritional problem and, least of all, to determine the effectiveness of intervention programs. This creates the need of establishing a Nutritional Surveillance System of a multisectoral nature to detect changes, forecast the deterioration of a given situation, and recommend action measures, not only in the development process but in emergency periods as well.

The responsibility of a Central Unit System in the organization of a data-receptor mechanism based on the existing information channels, and in the processing and interpretation of the data is also discussed. This Unit would be in charge of the planning, organization and coordination of the System's activities, and its execution would be carried out jointly with the involved sectors: national planning, health, agriculture, education, economy and social. In addition, the Unit would have hierarchy and direct access to the high-decision levels so as to be able to propose appropriate recommendations. The advantages of a horizontal structure for the development of the Surveillance System and the participation of each level, are commented upon. Inofar as to the operational structure of the System, the convenience of establishing an initial assessment of the nutritional problem is also discussed, as is the undeniable need of an initial assessment of the information subsystems of each participant sector, prior to starting the Surveillance System design. The planning steps of the Nutritional Surveillance System are briefly discussed, as well as the

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* Presented at: Colloquium on "Nutritional Epidemiological Surveillance Systems", IV Latin American Nutrition Congress, Caracas, Venezuela, 21-27 November, 1976.

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elaboration of forms, data collection, their transit, processing and interpretation, and the diffusion and feedback of the information, the training of personnel and the supervision and evaluation of the Nutritional Surveillance System. A series of conclusions and recommendations is included.

THE PROBLEM

In a great number of countries, including those of Latin America, information on the food situation and nutritional status of the population is tardy, incomplete and not always reliable. The data collected in regard to food and nutrition and their conditioning socioeconomic, health, agricultural and livestock, meteorological and other factors, are not systematically analyzed in function of the at-risk population groups,[1] a procedure which would provide a coherent picture and allow an evaluation of its relation with the nutritional problem. Furthermore, although many involved sectors are carrying out separate actions tending to their solution, the data available at present do not permit a regional characterization of the problem in the countries, and less still, to know the effectiveness of the intervention programs. This obviously makes it impossible to analyze the changes which occur in the nutritional status and in the social welfare of their inhabitants. Consequently, it also hinders the planning and the convenient programming of future actions.

Therefore, the previous panoramic view supports the convenience of establishing adequate information subsystems - which at first can be simplified - both of the food situation as well as of the nutritional status and their conditioning factors, already cited, utilizing a continuous surveillance system,[2] capable of detecting at a given moment, certain situations, and predict deterioration of same. The system must limit itself to the available knowledge on the epidemiology of the nutritional problem,[3] and must also take into account the characteristics and resources of the country.

INTRODUCTION

A Nutritional Epidemiological Surveillance System constitutes an information subsystem of the information-decision-control system of the food and nutritional situation and of its conditioning factors. Its purpose is to formulate recommendations at the decision levels, evaluate actions, and provide elements for the planning process.[4] Thus, the information subsystem must be based on the collection, transmission, processing, analysis, and interpretation of data.

On this occasion we shall focus our attention essentially on the administrative and operational structure needed for the processing of data and their interpretation in a National Nutritional Epidemiological Surveillance System. Some general considerations on the organization and functioning of the System will also be presented.

In the establishment of a Nutritional Surveillance System, the need to maintain a constant transmission of data that serve to construct indicators,[5-7] wich at any given moment reflect the food and nutritional situation of the population covered and of their conditioning factors, should be kept in mind. The administrative and operational structure of the System - of a multisectoral nature - must allow presentation in a continuous and permanent form in time terms, of a coherent picture of the nutritional situation and its causes; provide information on several aspects of the development of the program; detect and predict changes in the availability and consumption of foods and on the nutritional condition of the populations; recommend measures to prevent deterioration and even to improve said situation, and lastly, to determine the efficacy of said measures. In other words, the System would be an essential instrument in the formulation, planning, evaluation and readjustment of the food and nutrition policies, programs and projects both in the development process as in emergency periods.[8,9]

ORGANIZATION AND FUNCTIONING OF THE SYSTEM

The Nutritional Surveillance System should have a coordinating unit at the central level,[5] responsible for organizing a receptor mechanism of data pertinent to the food and nutritional situation and their conditioning socioeconomic, health, agricultural and livestock,meteorological and other factors. These would be sent by the local and regional levels which, for this purpose, would integrate the involved institutions, for the subsequent processing and interpretation of the data. With the information thus generated, it would prepare strategies to promote specific actions in each one of the sectors. The formal information systems already existent within the participating institutions must be respected and utilized, since they would be the basis for the above-mentioned receptor mechanism whose coordination would be in charge of the Central Unit of the System. In its turn, the latter would be responsible for the administration and functioning of the System. Therefore, this Unit would be entrusted with the planning, organization and coordination of activities of the System, whose execution would be carried out jointly with the integrating sectors, which would also benefit from same. This applies to national planning and to the health, agricultural and livestock, education, economy and social sectors. This is why the Central Unit would be responsible for motivating and providing to the authorities of the involved institutions, information as to the objectives, resources and scope of the System, the importance of their participation and the benefits that in terms of timely actions would each one of the sectors derive. The same strategy would be followed with the regional and local surveillance groups, so as to encase their responsibilities in the System.

In addition, the Central Unit would have to define and organize the necessary resources, both in human and in material and financial terms, in order to establish the technical facilities that permit the processing and analysis of the data and interpret the information derived from them in terms of sectoral recommendations.

Thus, the Unit must have sufficient hierarchy to have direct access to the high-decision levels for the purpose of formulating timely reccomendations for the adoption of the respective immediate actions in each sector at the appropriate levels and at the adequate moment. The information supplied by the Unit would constitute the primary basis of support for decisions judged as pertinent by those responsible of the policy, planning and administration of the food and nutrition plans, programs and projects. If this procedure is not observed, the setting-up of a Nutritional Surveillance System would not be justified.

On the other hand, the planning process of food and nutrition would utilize the information derived from the System which, unless used for this purpose, would be of little value. Both would mutually complement each other: the Unit would make available to the nutrition planning mechanisms the required data, and in its turn, the planning sector would utilize the information provided by the Unit.[10]

A. Specific Functions of the Central Unit of the System

Aside from being responsible for promoting and collaborating in the organization of nutritional surveillance activities at regional and local level, jointly with the sectors involved in the System, the Unit would have the following specific functions:

1. Organize the systematic collection of pertinent data originated from the institutions participating in the System, respecting and utilizing the information systems accustomed by each one of them.

2. Carry out the integration, processing, multisectoral analysis and interpretation of the data that, at definite intervals, are received from the regional and local levels of the System.

3. Prepare unified action strategies, both in normal and emergency situations,[8,9] that signal the measures which each sector should apply.

4. Diffusion of information on the actual situation and priority action areas through bulletins and periodic meetings and, when deemed necessary, through urgent communications. At the same time, feedback the different levels of the System.

5. Carry out periodic evaluations of the effectiveness of the Nutritional Surveillance System in regard to its capability for maintaining a permanent diagnosis of the food and nutritional situation; forecast changes and emergency situations; generate the corresponding actions, and obtain in the community the expected results.

6. Undertake studies on the characteristics of the indicators used, for the purpose of verifying their real value in the System.

B. Specific Functions at Regional and Local Levels

Aside from the functions proper of the local level, which are the systematic, precise and timely collection of data, and of the corresponding grouping of same on the part of the regional level, both levels should be responsible for the following activities:

1. Carry out a preliminary analysis of the situation on the basis of the recommended indicators and any other pertinent information.

2. Develop a data transmission mechanism of grouped and integrated data, from the periphery to the next level.

3. Establish a mechanism for the revision and analysis of the integrated data, for the purpose of obtaining information useful for each level.

4. Establish communication channels so that the accumulated information be transmitted to the periphery in such a way as to permit the adoption of decisions and the application of opportune measures.

These decentralized activities would allow a better quality and transit of the data. They would also help to improve the feedback process in making it more agile and fast, and thus achieve the expected results.

ADMINISTRATIVE STRUCTURE OF THE SYSTEM

Although the structure of the sectors and their degree of development vary from one country to another, there is a marked tendency towards decentralization and regionalization of same. In our criterion, this type of horizontal structure would be the most convenient for the development of a Nutritional Surveillance System, since it implies active participation of each administrative level. In this way, each one of them becomes the subject and the object of the System itself: the local or action level collects the data generated by the community; the regional or operative decision level supports, collaborates and supervises the local level; the central or technical and normative decision level carries out a periodic verification of the data pertinent to the sector, and transmits them to the Central Unit. Furthermore, it supervises the inferior levels (See Figure 1).

A. The Local Level and the Local Surveillance Groups

At local level and according to the plans outlined at the regional level, the personnel from each participating institution in charge of the collection and transmission of data should be structured into local surveillance groups. In view of the fact that at this level technical resources for the analysis of data are not available, the

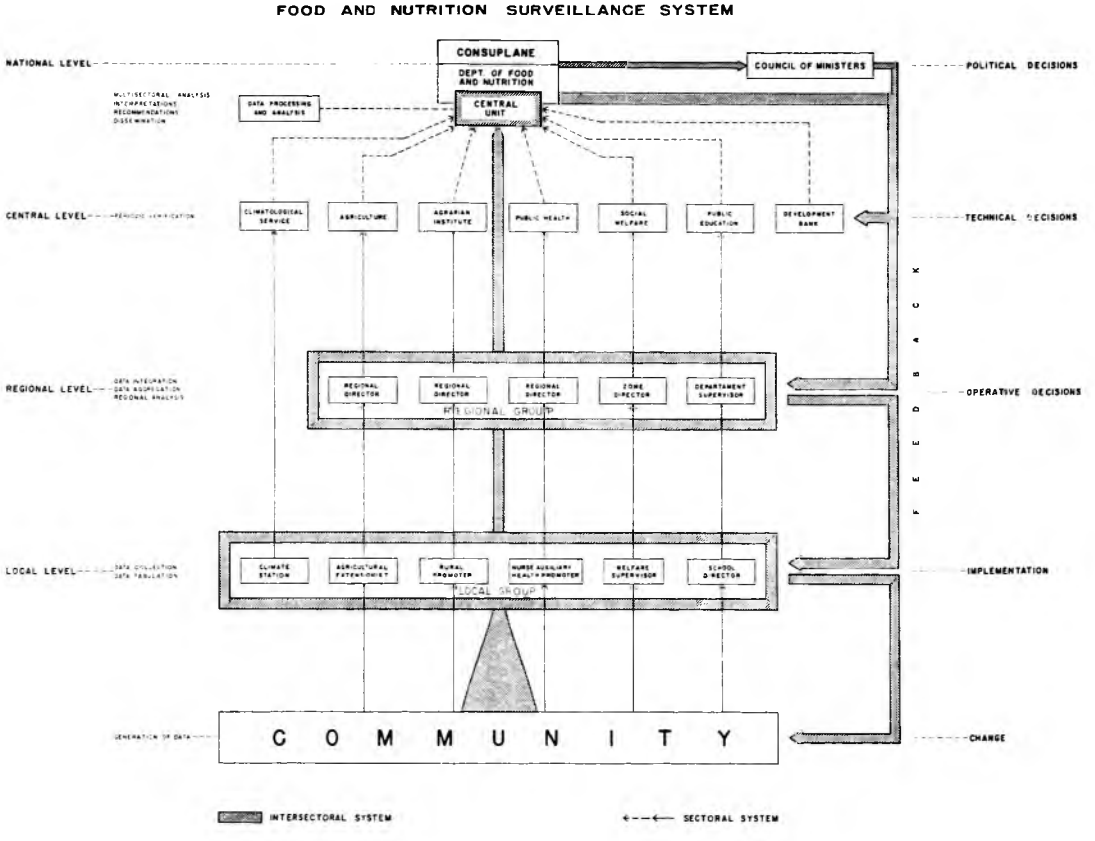

Fig. 1. *Nutritional Surveillance System.*

greatest part of the work would consist in revising and correcting them. Another aspect would be a very simple analysis of the changes that occur in the different data categories and then feedback the community. These would make possible the adoption of some basic decisions and put into practice opportune acions pertinent to this level and, at the same time, would serve as the basis for requesting advice and resources at the immediately superior (regional) level, when these prove to be necessary.

B. The Regional Level and the Regional Surveillance Groups

At the regional level and with the support of the Central Unit, regional surveillance groups should also be structured, formed by representatives of each of the institutions participating in the System. In many countries sufficiently trained personnel is available at this level in each one of the sectors to gather together and integrate data derived from the local level, to carry out an integral simplified regional analysis of the available data, to transmit them to the Unit, to recommend sectoral actions proper of this level, and to feedback the local level.

C The Central Level and the Central Unit of the System

At the central level the System would be represented by the Unit, which would count with its own specialized personnel and with the necessary national technical guidance. It would also have the direct and effective collaboration of the central units corresponding to each one of the sectors (Planning and Statistics Offices of each of the participating Institutions in the System, Departments of Nutrition and of Epidemiology of the Health Ministry, etc.). In addition, it would have processing and computation facilities, if possible through the use of computers. The Unit would be responsible not only for integrating the data, their multisectoral analysis and interpretation, but also for the presentation of results - in terms of recommendations - in a clear and comprehensive way, so that these results may be useful for the decision levels and for those responsible of the food and nutrition planning.

Likewise, in conjunction with the central authorities in each one of the institutions involved in the Nutritional Surveillance System, the Unit should establish the nature and extension of their participation. The definition of communication channels and the coordination mechanisms with the planning and statistics units of each institution, as well as with the local and regional surveillance groups should also be one of its functions.

In summary, in a horizontal structure the information of the System, which could be denominated an informal system, covers from the local level through the regional and up to the central level, with the data being analyzed with different degrees of depth and used in each level. In contrast, in a vertical structure, as some of those still existing at the present moment, and which corresponds to what we call formal information systems, the data go from the local directly to the central level. Thus, almost all of the responsibility falls in this level which is the one in charge of taking decisions and giving orders and indications to the local level so that this

translates them into actions. In this vertical structure, participation of the local level is rather passive.

On the other hand, the administrative location of the Unit is an important aspect worthy of consideration. It would be most advisable that it did not depend from any special ministry, except in those countries that have a Planning Ministry. If this were not the case, the most convenient action would be to locate it in the Government national planning units or offices, or else in such a way that it functions in close association with the latter. As we already commented, it should also count with all the necessary technical support to cover the multisectoral nature of the activity and have direct access to the high governmental levels. Its budget would have to be adequate so as to cover operational expenses, computer time, and diffusion of information.

Lastly, it would be convenient to try out the Surveillance System in a limited geographic area for the purpose of obtaining some practical experience in activities such as the training of personnel, the integration and functioning of the local and regional surveillance groups, and the design of instruments for the collection, transmission and processing of data and analysis and interpretation subsystems. This would ensure an adequate development of the System and its regular supervision during the try-out period of its functioning. Later, it could be gradually expanded until it reaches national coverage. The selection of this area of implementation for an initial normalization of the System should be undertaken on the basis of certain technical-administrative criteria. These shall be dealt with, when planning of the System is discussed (See numeral 4 of the following Section).

OPERATIONAL STRUCTURE OF THE SYSTEM

With the information already at hand in each of the sectors and if this were possible, counting with additional data, in very necessary cases it would be advisable that before implementing the System an initial assessment of the nutritional problem be undertaken.[11] This would include identification of location (areas) and how many and who are at risk (population groups) as well as the causes of why the problem exists (variables feasible of measuring).[10] Not always do the countries have the human, economic and time resources required to carry out the initial assessment. If this were the case, it is always convenient that prior to designing the System, an initial assessment of the information subsystems of each one of the sectors involved be made. This implies the identification and analysis of the sources of data, especially their collection and transmission mechanisms to verify which are de data collected, with what frequency, how reliable are they, which of them are useful for the System, the transit channels they follow, etc., and thus be able to determine the needs, in case they exist. In a great number of countries many data are actually collected which can serve the Nutritional Surveillance System and the most convenient action is to utilize the sources of data which already exist. If necessary, the quality of same should be improved and, as the System is developed, new data could be collected to permit the building-up of new indicators and perfectioning of the System.

A. Planning of the System

This phase of the planning process implies the following steps:

1. Design of the System

2. Presentation and reviewal of the design jointly with the participating institutions.

3. Selection of indicators taking as a basis the findings of the initial assessment already discussed.

4. Selection of the geographic area for the normalization or implementation to initiate the System, for which purpose it would be necessary to consider, among others, the following minimal criteria:

a) representation, in the area, of the institutions participating in the System;

b) presence of expansion of primary health care programs:

c) presence of the agricultural extension agencies;

d) easy access;

e) facilities for continuous supervision;

f) high prevalence of malnutrition, and

g) high mortality in the 1-4 year-old group.

5. Definition of functions and responsibilities of the institutions participating at the different levels.

6. Preparation of norms[1 2] for all of the operative levels of the System, taking into account those already existing in each one of the sectors, where the training aspect is also included, and even that of preparation of the necessary teaching materials, above all, for use at the local level.

7. Definition of the advisory services and equipment and material facilities at each operational level in order to ensure the effective participation of the institutions involved in the System and, hence, the adequate functioning of same.

B Preparation of Forms and Instructions

The design, testing and readjustment of the forms and instructions needed in each level for the collection and transmission of the data required by the System

would be necessary. This would be done in collaboration with each institution in order to transmit the pertinent data to the Central Unit, with the required periodicity. The forms should be designed in such a way that, if necessary, data could be interpreted without processing by computer. The final objective is to obtain general immediate impressions and, inclusive, to be able to make manual calculations.

C. Design of the Subsystem for the Collection and Transmission of Data

In regard to this matter, it implies the preparation of guidelines that form part of the norms established for the System, that define at each level the type of data to collect and their presentation form as well as the mechanism and periodicity of their transmission, utilizing for this purpose previously prepared forms. We consider that the mechanism for transmission of data is of utmost importance in the functioning of the System. This is why it should be designed so that interpretation of such data at the level of the Central Unit is available as early as possible from the moment the data were collected.

D. Design of the Subsystem for the Processing, Analysis and Interpretation of Data

Although the local and regional surveillance groups should carry out a first analysis of the data, in a very simple way as we already commented, the Unit would be the main responsible for the processing, analysis and interpretation of the System's data. This requires the development of a subsystem for the processing of data and the design of a computer program so that the analysis of the data received from the diverse sectors permits the rapid obtainment of information through the selected indicators. Interpretation of such data should be done on the basis of the existing knowledge, starting from comparisons and through the quantitative relations to be constructed as the System is developed. One of the priorities of this interpretation would be the construction of tendencies and predictions.[2] It would be necessary to plan an objective multidisciplinary method of interpretation to apply to the information produced by the System in terms of the definition of the food and nutritional situation of the population, and of the interventions recommended for each sector. In other words, interpretation should pursue, first, immediate initial actions, and second, determination of the relations between the variables for high-level programming.

E. Dissemination and Feedback of Information

In order to maintain a two-way information transit, it would be necessary to structure operative mechanisms through which information is disseminated to the different levels of the sectors participating in the System. In this sense, the design of adequate mechanisms so that the information returns to the source where the data originated, and to keep the regional and local personnel duly informed of the more significant results is of particular importance. This would not only facilitate the adoption of decisions proper of the level itself, but it would also ensure and compromise its active participation in the System.

The community would have to be kept informed so that it participates actively both in the identification of the problems and in the analysis of new situations, as well as in the measures adopted for their solution. If the community is aware and conscious of its food and nutrition situation, as is its duty and right, its active involvement will be achieved.

F. In-Service Training of Personnel

The training of personnel must be done in accordance to the level of location and to the activity it develops within the System. Thus, it would have to be programmed jointly with the regional groups, taking into consideration the needs and type of in-service training required for the functioning of the System, both at regional and local level. In the course of this training - which would be carried out in the local or regional level - besides contemplating a strong motivation component and of placing emphasis on the importance of the contribution of the System's personnel, it is necessary to submit to discussion the organization and general functioning of the Nutritional Surveillance System. The same would have to be done with each of the chain links and their interrelation, underlining the fact that any interruption compromises or endangers its objectives and results.

It would be convenient to impart the in-service training in a joint and integrated way to all the field personnel of the involved sectors, in order to make them realize from the very beginning, the multisectoral nature of the System. In addition, training must be provided at the different operative levels and be imparted on the basis of the norms prepared for the System, by means of short courses and seminars. Insofar as personnel from the Central Unit, the training they receive must be of a high level, with particular emphasis on the processing, analysis and interpretation of data.

On the other hand, it would also be advisable to impart continued education to personnel participating in the System, utilizing the supervision visits as an additional and permanent means of in-service training.

G. Supervision and Evaluation

Considering that the supervision and evaluation activities should in great part support the good functioning of the System, it would be necessary to design and develop a mechanism for the periodic and permanent supervision of the System as well as to evaluate its effectiveness.

If there already exists a decentralized horizontal structure as the one proposed herein, most of the supervision and evaluation activities should logically fall on the Central Unit and in the regional level. Only through direct contact with the operative levels that permit reinforcement of the training component which should accompany every supervision activity, besides the control,[13] can the quality of the actions and instruments of the System and the System itself improve.

CONCLUSIONS AND RECOMMENDATIONS

1. Information on food and nutrition available in our countries presents an ample range of variation. On the other hand, it is not often opportune or reliable, and neither is it analyzed in an integral form which may give way to offering a coherent framework of the situation, on the basis of which, policies, planning, and evaluation interventions could be formulated.

2. For the purpose of detecting changes, predict deterioration of the situation and to know the effectiveness of the actions, the establishment of a Nutritional Surveillance System of a multisectoral nature, based on indicators and their interpretation, is recommended.

3. For the development of a System like the one proposed herein, the horizontal structure would be the most convenient, given the active participation that each administrative level would have (local, regional, central). These would serve to integrate the multidisciplinary surveillance groups which would gather and analyze jointly and in a very simple way, the data from the different sectors, therefore allowing the adoption of some actions of the level itself, and the feedback to the immediate, inferior level.

4. It is recommended that the System be organized on the basis of the data and channels of information already available, and that its development be in charge of a Central Unit of the System. The latter would process and interpret the data received from the multisectoral regional and local surveillance groups, integrated by the participating health, agricultural, education, economy and social sectors.

5. The Unit should have sufficient hierarchy for obtaining data from each of the involved sectors, and also have direct access to the high-decision levels to formulate well-timed recommendations in regard to the adoption of actions corresponding to each sector. The information provided by the Central Unit in terms of recommendations would be the basis for these decision levels, and for those responsible of the food and nutrition planning.

6. The Nutritional Surveillance System should be started in a selected geographic area that adjusts to certain stipulated criteria for its first normalization. In the light of the experience gathered, its development and gradual expansion could then be ensured in an adequate way until it reaches national coverage.

7. If facilities are available, it would be recommendable that prior to implementing the System, a multisectoral initial assessment of the nutritional problem be undertaken on the basis of information already available in the sectors. Nevertheless, an initial assessment of the information subsystems in each one of the involved sectors should be undertaken in order to determine the needs.

8. Finally, it is recommended that the Central Unit dedicate particular attention to the selection of indicators, preparation of norms for all the operative levels, and to the training of personnel as well as to the supervision and evaluation of the System.

RESUMEN

ESTRUCTURACION ADMINISTRATIVA Y OPERACIONAL DE UN SISTEMA DE VIGILANCIA EPIDEMIOLOGICA NUTRICIONAL

Los datos referentes a la situación alimentaria y nutricional de nuestras poblaciones no permiten obtener un cuadro coherente ni evaluar su relación con el problema nutricional y, menos aún, conocer la efectividad de los programas de intervención. Esto plantea la necesidad de establecer un Sistema de Vigilancia Epidemiológica Nutricional de naturaleza multisectorial por cuyo medio se pueda detectar cambios, predecir el deterioro de la situación, y recomendar medidas de acción, tanto en el proceso de desarrollo como en períodos de emergencia.

Se aborda el tema de la responsabilidad de una Unidad Central del Sistema en la organización de un mecanismo receptor de datos, basado en los canales de información ya existentes, y en el procesamiento e interpretación de los mismos. Esta Unidad tendría a su cargo planear, organizar y coordinar las actividades del Sistema, cuya ejecución se realizaría juntamente con los sectores involucrados: el de planificación nacional, de salud, el agropecuario, el de educación, de economía y el social. Además, tendría la jerarquía suficiente y acceso directo a los altos niveles de decisión para emitir las recomendaciones oportunas. Se comentan las ventajas de una estructura horizontal en el desarrollo de un Sistema de Vigilancia Nutricional, y la participación de cada nivel. En cuanto a la estructura operacional del Sistema, se plantea la conveniencia de efectuar una valoración inicial del problema nutricional y la necesidad insalvable, antes de iniciar el diseño del Sistema de Vigilancia, de una valoración inicial de los subsistemas de información de cada sector participante. Se contempla también brevemente las etapas de planeamiento del Sistema, de elaboración de formularios, recolección, transmisión, procesamiento e interpretación de los datos, así como de su difusión y retroalimentación, al igual que el adiestramiento del personal y la supervisión y evaluación del Sistema de Vigilancia Nutricional. Por último, se esbozan algunas conclusiones y recomendaciones.

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