HEALTH SECTOR INFORMATION IN A NUTRITIONAL SURVEILLANCE SYSTEM*

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SUMMARY

The contribution of the health sector to nutrition surveillance systems is fundamental as it measures the final impact of change in causal and contributory factors of malnutrition. Operational as well as statistical criteria must be considered in the process of selecting appropriate indicators for surveillance. In practice, choice is dependent on the range and quality of health data currently collected, as well as on the structure and efficiency of existing information systems. Training and motivation of health personnel, especially at the periphery of the system are basic components of effective surveillance, while the development of simple instruments and defined procedures are essential for adequate data quality. There is need for extensive investment in these areas for a successful surveillance program to be developed in Latin America.

INTRODUCTION

The basic objective of a nutritional surveillance system is the improvement of the nutritional status of the community; consequently, the contribution of the health sector is of fundamental importance. This sector is responsible for generating precise and reliable information on the final impact, in human terms, of the changes that occur in the chain of causal and contributing factors of inadequate nutrition. Thus, it has the unique responsibility of evaluating any deterioration or improvement of a given situation due to spontaneous change or to planned intervention.

In the past, non-health sectors took independent decisions in accordance with

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their own objectives which affected the responsibilities of the health sector, almost always in a negative form.[1] With an effective nutritional surveillance system, the health sector can influence these decisions in such a way as to avoid the negative impact and, more importantly, to contribute to improvement of nutritional status. Even though surveillance systems can be developed in the context of specific types of nutritional deficiencies, this presentation is limited to situations where malnutrition is a problem that affects the population in a more generalized and severe way, and where health services operate with very limited resources.

The contribution of the health sector is expressed in terms of information based on the technical interpretation of a series of indicators. The selection of these indicators will depend on certain statistical requirements such as validity, sensitivity and specificity, and also on a series of operational demands such as the precision, reliability and availability of the data from which they are derived.[2]

In theory, there is a great variety of health indicators that can be used in a surveillance system. In practice, their selection is limited by two important restrictions: a) the necessary experience to determine their statistical characteristics and b) the range and quality of the available data. To a certain degree, the first depends on the experience which may exist at national and international levels on the statistical quality of the indicators, and on the availability of resources to carry out validity studies in those cases where experience is lacking. The second, of a fundamental nature, usually determines the final selection of indicators in those countries where the health services resources are limited. In view of the importance of the latter restriction, it may be more appropriate to initiate this analysis by examining the conditions in the peripheral areas of the surveillance system where direct measurements and observations generate the primary data.

GENERATION OF DATA

In the peripheral area it is important to consider not only the range, quality and availability of data but also the category, training and experience of the personnel who collect them and the facilities and equipment available for their use.

The range of data generated in the health sector which can be used in a surveillance system, are arbitrarily grouped in three broad categories:

A. Pathology: mortality and morbidity

B. Physiology: anthropometry, dietary consumption and biochemistry

C. Intervention: Immunizations, environmental sanitation and food supplementation.

A. Pathology

1. Mortality

The level of death registration in a community varies from country to country and within the different areas of the same country.[3] In general, the under-registration tends to be greater in those areas where the health and nutrition problems are the most severe; the lack of an adequate infrastructure simultaneously affects both variables. Furthermore, under-registration can be selective in terms of age, and consequently, of the cause of death.[4]

The level of under-registration also depends on the notification system used for surveillance purposes. Frequently, in rural areas of dispersed population, one finds high levels of under-registration in the civil system due to a variety of administrative and socio-cultural reasons. On the other hand, where there is full extension of services, the level of registration, through health promoters or primary care workers in the community, can be high.

The diagnosis of the cause of death is another restriction in the use of mortality data. The level of medical certification of the deaths registered is relatively low in many countries, particularly in the rural areas. On the other hand, where there is an ample coverage of the services by means of primary health care workers, the diagnosis rate of the cause of death in the community can reach a high level. In simplified primary health care systems, the health workers are capable of identifying with precision a limited number of causes of death, among which malnutrition may be included.

The variation in the level of under-registration and of diagnosis, constitutes a problem difficult to solve. Where health services exist, it is probable that this level is maintained relatively constant, while, where there is a progressive improvement of the services and of the infrastructure in general, it is very difficult to evaluate trends in the registration level. The only way of solving this problem is through periodic surveys for verification of mortality reporting.

2. Morbidity

Data on morbidity represent an important information source in the surveillance systems. These offer a more sensitive base for the construction of indicators than those derived from mortality; however, they do have serious limitations in regard to coverage, precision and reliability. At the hospital level, diagnosis of malnutrition is relatively easy and precise, and the problems arise more frequently in the process of recording of the data. The undernourished child is rarely taken to the hospital free of complications such as infectious processes and these are usually registered as the reason for their admission. This situation results in a substantial under-recording of malnutrition and the only source of precise data is the clinical history. Any study that attempts to evaluate morbidity at the hospital level will have to consider a system that permits identification of the contributing causes through a direct review of clinical histories. As an additional source of data at this level, it is feasible to utilize other

diagnosis, such as diarrheal diseases and common infectious processes, as indirect indicators of morbidity caused by malnutrition. In these cases, the precision of the diagnosis is more acceptable for surveillance purposes, although specificity may be lower.

At the primary care level, the recording problem is less complicated if adequately trained personnel are establishing the diagnosis. Here the problem is more one of coverage and representativeness of the population which uses the service. Where coverage is limited, malnutrition may progress until it becomes severe, before it reaches the health services and, if the case is very severe, it will probably go directly to the hospital. In situations where there is full coverage based on simplified health care, morbidity data may have considerable value when assessing the nutritional status of the population. The value of the physical signs of specific deficiencies is yet to be demonstrated in terms of nutritional surveillance. The specificity and sensitivity of many of them are doubtful, and their identification requires the services of a physician who, in general, is not available in areas where these signs might be useful.

B. Physiology

The data on the physiological status of an apparently healthy population serves as the basis for a series of sensitive and specific indicators. Nevertheless, in practice only a very limited variety of data within this category are collected or utilized. Anthropometric data are more frequently used and have been described in some detail by Jelliffe.[5] In spite of their technical simplicity, in surveillance systems they are liable to present problems relating to precision and reliability. The lack of standardized equipment, the omission of regular calibration, and the absence of detailed instructions on procedures are common sources of error.

Biochemical measurements generate data on which more specific and sensitive indicators of nutritional status can be based. However, the lack of laboratory facilities and simple, low-cost equipment greatly limits their use in practice. Data on hemoglobin during pregnancy are the most frequently available but even these are relatively scarce outside of health centers in urban areas.

Observations on dietary consumption represent a useful source of data to measure the nutritional status in a relatively direct way. While the use of the large-scale dietary survey has been abandoned, the potential for utilizing simple questionnaires by auxiliary personnel is considerable. In the case of programs with extended coverage, health care personnel can be trained to use simple but precise questionnaires concerning dietary consumption, comparing the answers with specified standards. In this way, they can evaluate the diet in general terms, using categories such as good, adequate or poor. If this type of observation is well developed and carefully standardized during the training period, it can generate very useful data for surveillance purposes.

C. Interventions

Preventive measures represent a substantial contribution to changes in health

status, mainly in reference to the control of infectious diseases. In almost all circumstances, data on inmunizations and environmental sanitation are collected by the health services and are usually transmitted to the central level. Data on inmunization against whooping cough and measles are specifically useful even though natural inmunity levels can not be taken into account.

Finally, food distribution or dietary supplementation programs also generate useful data at local level which can serve as a basis for the construction of intervention indicators.

RECORDING AND TRANSMISSION OF DATA

In the health sector, the aggregation of data from the periphery and its transmission to the central level depends on the organization of the services themselves, which in turn depends on the political-administrative characteristics of the country. The degree of decentralization of services will determine the intermediate levels, whether these are departmental or regional, where data can be summarized and analyzed in one way or another. The nature of the data itself will also determine the frequency of transmission and the level to which they are transmitted. In general, data on mortality and hospital morbidity are transmitted to the central level, through the intermediate stages, while, for example, data on growth and development or birth weight are often neither analyzed nor transmitted, and remain in individual or family records at local level. Other operational data such as the frequency and type of assistance given are usually transmitted to an intermediate level for supervision and evaluation purposes. These include important information on diagnoses that may be utilized for surveillance purposes. Data on preventive activities such as inmunizations and environmental health are usually summarized and transmitted to intermediate and central levels so that they are accessible at any stage of the system.

The level to which data are transmitted determines the method to be used for obtaining them for surveillance purposes. In general, those transmitted to a more central level can be obtained in a progressively aggregated form, utilizing the same records used for their transmission. However, it must be recognized that each aggregation normally implies a progressive loss of detail, which gradually reduces its usefulness for surveillance.

For surveillance purposes, detailed information frequently is not transmitted routinely from the local level, and methods must be used to obtain it directly. For example, it is feasible to consider the use of periodic surveys of records used at the local level by auxiliary nursing or nutrition personnel. This can be done by making a complete review of all records accumulated during a certain period of time or, if there are many, through systematic sampling.[6] In this way, useful anthropometric, clinical, and sometimes dietary data can be obtained for surveillance purposes. This approach does not consider the quality or coverage of the data, but if it is regularly utilized, it can indirectly stimulate the health personnel to pay more attention to the observation, measurement and recording processes.

In summary, the collection and flow of data will be mainly determined by the existing procedures for the transmission of data within the health sector. In order to have access to these data, the possibility of using special surveillance forms must be considered, although this implies additional work. In the case of data that are not transmitted in any way, it is necessary to consider the use of file surveys carried out at local level.

As indicated previously, the training, experience and motivation of personnel in charge of recording and transmitting data is important in determining the effectiveness of the system. In rural areas much data utilized for nutritional surveillance are not recorded by the physician or the nurses, but by auxiliary personnel at the level of small communities. While the physician and nurse receive a long training in the principles of the "scientific method", the auxiliary personnel do not have this philosophy. Consequently, more attention should be given to the quality and content of their in-service training and to the use of simplified technical guidelines. The questions of calibration of equipment, standardization of measurement procedures, and the degree of precision of measurement should be considered within this context. Perhaps the most important factor of all is motivation. It is fundamental that personnel know *why* a determination or measurement is done, *how* the data are used at other levels and, above all, that they receive regularly and in an understandable form the information derived from the analysis.

INDICATORS

With regard to indicators of nutritional status of the population, a great variety have been developed in different parts of the world, and many of them are published in the scientific literature.[7-9]

For the purposes of this presentation it is convenient to consider some basic concepts concerning these indicators. First, it is necessary to distinguish between direct and indirect indicators because the category determines their usefulness for surveillance purposes. In regard to the direct indicators there is no major doubt as to their validity: malnutrition is measured directly. On the other hand, indirect indicators such as morbidity for diarrheas or measles or the ratio between mortality in children 1-4 years old and general mortality, are based on assumptions of variable validity. Thus, assumptions that justify the use of an indirect indicator in a specific part of the world under given circumstances, are not necessarily justified in another situation. The only manner of verifying the validity of these indicators in a definite way is through direct experience obtained in each area. In this sense, the present world interest in nutritional surveillance systems, recently expressed at a WHO/UNICEF/FAO[9] interagency meeting, will stimulate the accumulation of information or experience which may help to evaluate the quality of indicators already in use.

While our knowledge on the value of indirect indicators improves, it is appropriate to look for ways of improving the quality and availability of data based on direct

observations such as weight-gain during pregnancy, birth weight, duration of breast-feeding and, most important of all, the weight/height ratio in preschool children. There is also a need to study new simplified methods on which an auxiliary nurse or trained birth-attendant may classify maternal diet in simple terms.

In conclusion, if the health sector is expected to contribute actively to nutritional surveillance systems, it will be necessary to dedicate an adequate level of resources to the training of personnel, not only in terms of technical content, but also in the concepts of scientific methodology and the principles of epidemiology. On the other hand, the directors of services have the obligation to ensure the continued use of the collected data by means of regular analysis and feedback to the level of origin.

As far as research is concerned, there are two evident priorities. On the one hand, there is need to carry out and compare epidemiological studies in order to verify the validity and reliability of indirect indicators and, on the other, there is a need to develop simple methods and instruments to measure nutritional status. In relation to epidemiology studies, there is great scarcity of retrospective investigations of exceptional situations and natural disasters where marked changes in regard to causal and conditioning factors have occurred and, in consequence, in the status of affected populations. Even accepting the fact that nowadays emergency interventions will complicate analysis, a greater investment of resources in this type of study is justified. Furthermore, in the same way, good quality retrospective studies can offer equal or greater benefits than prospective studies, due to the difficulty of reproducing in controlled studies the complexity of causal factors that occur in natural situations.

In regard to research on instruments, there is an increasing need to develop simple measurement and observation methods that can be utilized by auxiliary personnel working with few resources and without constant supervision. The definition of simple procedures, the preparation of reference tables and the availability of low-cost and simple equipment are essentials to obtaining greater precision in the nutritional surveillance process. Both in anthropometry as well as in biochemical and dietary studies, there is an urgent need to organize a coordinated research program for this purpose. It is evident that this objective is easily achieved from the point of view of the existing technology; what is lacking is an adequate investment of resources.

RESUMEN

INFORMACION DEL SECTOR SALUD EN UN SISTEMA DE VIGILANCIA NUTRICIONAL

Se consideran los aspectos técnicos y operacionales de los sistemas de información en el sector salud que contribuyen al proceso de la vigilancia nutricional. Se discuten los datos e indicadores sobre la patología, la fisiología y las intervenciones que se pueden utilizar en la práctica. Se ofrecen recomendaciones sobre prioridades de adiestramiento de personal e investigación aplicada para el desarrollo futuro de estas actividades en América Latina.

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