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Editorial introduction

Surveillance for Actions towards Better Nutrition

Almost two decades after it was first defined, nutrition surveillance has only partially fulfilled its original goal and objectives, largely because of failure to make information systems action-oriented. Consequently, efforts were made to establish a nutrition surveillance information system in developing nations. Complex data collection and processing techniques were designed, but the system and its results were disappointing in terms of their influence on decision-making. The nutrition surveillance system either served less well than expected, or in some cases not at all, despite key decisions being made about nutrition programming. At the fifteenth International Congress of Nutrition, held in Adelaide, Australia, in 1993, a symposium on Surveillance for Actions towards Better Nutrition was organized to analyse nutrition surveillance from an action-oriented perspective. Five papers from this symposium appear in this issue of the *Food and Nutrition Bulletin*.

In the first, Urban Jonsson discusses the historical development and evolution of nutrition surveillance and presents an evaluation from the experience and perspective of UNICEF. He summarizes country experiences with nutrition surveillance as well as growth monitoring and promotion as extensively discussed in various meetings sponsored by WHO, FAO, and UNICEF. The importance of this paper lies in its detailed presentation of a new nutrition information strategy that UNICEF is now promoting. Two important components of this strategy are the design or redesign of the nutrition information system and the promotion of five critical success factors. Its systematic identification of the reasons for past failures combined with guidelines for avoiding them will be useful to everyone responsible for the design and presentation of nutrition surveillance programmes.

The second paper, by Soekirman and Darwin Karyadi, reviews the nutrition surveillance experience of Indonesia with an emphasis on planners' perspectives on its development, implementation, and performance. The authors describe the establishment of nutrition surveillance as a timely warning system to alleviate food shortages in certain areas of the country. The system eventually became a surveillance system for nutrition in a non-disastrous situation and has functioned as intended to serve the information needs of planners in Indonesia.

The third paper, by Ligia Rodriguez, reviews characteristics of nutrition surveillance for programme planning and management. The Costa Rican experience is used to exemplify how the system works. Height at school entry and a social development index were used to identify priority areas for action.

In the fourth paper, Dr. Aree Valyasevi et al. present the Thai experience with community-based nutrition surveillance and describe how growth monitoring has been used as a tool for problem identification and has been linked to action to improve the nutrition status of children under five years. The effort was strengthened further when it became an integral part of implementing the nation's poverty alleviation plan and basic-minimum-needs approach. Achieving nutritional objectives was perceived as a means to achieve a good quality of life, which is the broader goal of nutrition improvement. The approach has contributed to an impressive improvement in the nutrition and health situation of the most vulnerable group in Thailand.

In the fifth and final paper of the symposium, Berhane Gizaw discusses Ethiopia's experiences in dealing with recurrent natural calamities that threaten food security. Monitoring of food shortages and food prices together with measuring nutrition indicators (i.e., weight-for-height of children under five) has helped to identify risk-prone areas as well as priority targets for intervention. The system has become established to provide an early warning system for the recurrent problem facing the population.

A sixth paper, by Bloem et al., not part of the symposium, describes the application of a national nutrition surveillance programme in Bangladesh. It is noteworthy for its use of NGOs to collect data and for its quality controls. Examples of its usefulness are given.

Towards an improved strategy for nutrition surveillance

Urban Jonsson

Recent reports on the nutrition situation in the world [1, 2] show that about 2 billion people are affected by malnutrition in one form or the other. The prevalence of protein-energy malnutrition (PEM) among young children went down from 32% in 1975 to 26% in 1992, but the absolute number increased from 170 million to 192 million. Iodine deficiency disorders (IDD) affect 500 million people; 190 million preschool children live in areas where they are at risk of vitamin A deficiency (VAD); and about 370 million women are affected by iron-deficiency anaemia (IDA).

Improvement in nutrition status has been slow despite decades of nutrition programmes and projects. This created fatigue among donors, who increasingly perceived malnutrition as a direct reflection of poverty. Many agencies therefore reduced their support to direct nutrition interventions and focused on alleviating poverty.

During the last few years, however, a change in perception has taken place, and for several reasons. First, more careful analysis reveals that several countries with a low per capita gross national product have improved their nutrition situation much more than some countries with a much higher per capita GNP. Second, studies on the prevalence of micronutrient malnutrition increasingly report that many more people are affected by IDD, VAD, and IDA than expected. Third, research shows that the functional consequences of all forms of malnutrition are much more severe than expected, including the consequences of marginal and subclinical forms. Mild and moderate PEM may increase the mortality risk by 2% and 3% respectively. Vitamin A deficiency may increase mortality by more than 20%, and IDD is the most common cause of mental retardation. Many forms of malnutrition affect the development of children negatively in various ways, including reducing their educability and reducing their productivity as adults. Increasingly, the prevention and control of malnutrition are being seen as necessary components in development policies, strategies, and programmes, and governments and agencies are finally understanding this.

This changing perception is paralleled by increasing awareness that a substantial improvement in nutrition can be achieved even in poor countries and communities. Rather than malnutrition being seen as just a result of poverty, it is increasingly being recognized that it also contributes to poverty and that improved nutrition status makes an important contribution to reducing poverty.

This more optimistic perception reflects an emerging new development paradigm about the relationship between economic development and human development. Instead of looking at economic development as a necessary prerequisite for human development, investment in human development is recognized as a key intervention for economic development [3–5].

This new thinking combines the scientific and ethical aspects of development work. Social research and experience show that poor people should be recognized as key actors in development rather than passive beneficiaries of commodities and transfers. Their survival and coping strategies are among the most appropriate and resource-relevant actions. With such a view, development work must become participatory, with the aim of empowering poor people, communities, and countries. With empowerment come ownership and sustainability.

The emphasis on the ethical or normative aspect of development is clearly reflected in the unprecedented consensus in the World Summit for Children (WSC) and the rapid ratification of the Convention on the Rights of the Child (CRC). This trend reflects the global democratization process in which increasing numbers of people reject the presence of overt poverty in a world that has the means to alleviate it. The CRC and the WSC goals (which specify

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some of the rights in the CRC) represent a non-ethnocentric moral minimum. Implementation of the CRC can therefore be seen as a first real step in achieving democracy.

Optimism is also a result of an increasing number of successful nutrition-oriented programmes and projects. Studies of these programmes and projects have shown that they are very similar [6]. Improved management of resources through better use of information is one very important success factor [7]. Solving nutrition problems requires improved management of resources at all levels of society. Improved resource management in turn implies positive changes in the decisions and behaviour of individuals and institutions that control resources. Decisions and behaviour are a function of human goals, beliefs, values, perceptions, emotions, and habits. At the individual level they are shaped throughout one's lifetime by socialization, education, experience, and the acquisition of knowledge and perspectives from many sources. Similarly, institutions have their own goals and decision-making processes that influence the decisions and behaviour of individuals. Decisions about resource management depend on the complex interaction between individual and institutional decision-making processes. The proposed nutrition information strategy therefore aims to strengthen this interaction and to rationalize and enhance the use of information to improve nutrition-related decisions at all levels of society.

The UNICEF nutrition strategy

In 1990 the UNICEF Executive Board adopted a strategy for improved nutrition that reflects the new development thinking [8]. Both scientific and ethical aspects of the problem of malnutrition in society are recognized, the latter through the explicit position that nutritional well-being should be seen as a human right.

The scientific aspects of the strategy include both a theory and an approach to practice. A theory in social science must be useful in practice, and practice is blind without a theory. Thus interaction between the two is most important.

A theory is proposed in the form of a conceptual framework that shows the most likely causes of malnutrition. The key elements and aspects of the proposed framework are the following:

1. Nutrition status is identified as an outcome of processes in society.
2. Malnutrition is a result of immediate, underlying, and basic causes in a hierarchical manner.
3. Access to food, adequate care of children and women, and access to basic health services, together with a healthy environment, are necessary conditions for nutritional well-being (nutritional security).
4. The availability and control of human, economic, and organizational resources determine the potential for fulfilling the three necessary conditions for nutritional security.
5. Education influences the use of any type of resources in efforts to achieve the three necessary conditions.
6. The availability and control of resources (i.e., entitlements) are a result of previous and current technical and social conditions of production, together with political, economic, and ideological-cultural factors.

Strategies to prevent and control malnutrition should aim at attacking the underlying, immediate, and basic causes simultaneously. Support to deliver services (feeding programmes, oral rehydration therapy, vitamin A supplementation, expanded programmes of immunization, etc.) addresses primarily the immediate and some of the underlying causes. Capacity building (education, training, etc.) aims at a more efficient use of existing resources to achieve the necessary food, health, and care conditions. And empowerment (income/price policies, employment, income generation, land reforms, etc.) aims at increasing the availability and control of resources for nutritional improvements. To give fish to a poor person is service delivery; to teach the person how to fish is capacity building; to ensure access to a river or lake is empowerment. The framework is summarized in figure 1.

The UNICEF nutrition strategy also outlines an approach to practice based on understanding how coping strategies work. "Coping strategies" refers not only to households and communities but also to strategies adopted and implemented by districts,

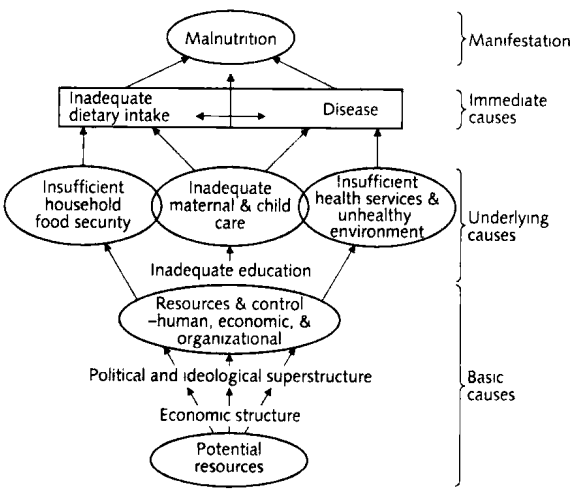

FIG. 1. Causes of malnutrition—the conceptual framework

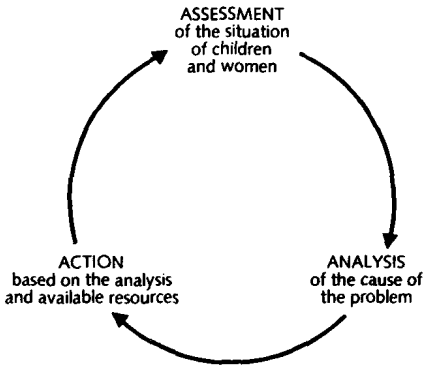

FIG. 2. The triple-A process

provinces, and national governments. They all aim at efficient and effective use of resources.

All these strategies can be described by a generic construct called the "triple-A" approach, comprising *assessment* of the problem, *analysis* of the causes of the problem, and design and implementation of resource-relevant and feasible *actions*, followed by reassessment (monitoring) of the impact, improved analysis, and better actions (fig. 2). This triple-A cycle is repeated as reassessment and reanalysis are made after action has been taken, to see what the effect of the action has been and what additional actions may be needed. This analysis-action-reanalysis cycle is a function of any management process, whether by parents concerned about the health of their children deciding whether to take them for treatment, or by national or international executives deciding whether to allocate more funds for nutrition programmes. Decision makers, people taking action, must have information to understand the extent of the problem and its causes and to monitor and assess the results of actions taken to try to solve the problem.

Nutrition information systems

All nutrition information systems can be seen as variations of the triple-A cycle. They all should have some means of detecting the existence of a problem, a mechanism for identifying the causes and solutions, and an effective way to communicate this to persons responsible for taking action. For the five main types of nutrition information systems, these might take the following forms when correctly implemented:

» In growth monitoring and promotion (GMP), these steps are accomplished by weighing children, plotting their weights on charts, connecting the points to see the direction of the curve (assessment), investigating the possible causes of inadequate growth through dialogue with the mother (analysis), and communicating the required actions, including changes in behaviour and in allocation of available resources or reinforcing the existing behaviours of the mother, father, or others (actions).

» In community surveillance, these steps might be aggregation of quarterly GMP results to estimate the total numbers malnourished (assessment), discussing the possible reasons for these levels in a village development committee (analysis), and initiating household- or community-level interventions (action).

» In surveillance for programme management (e.g., at district level), the steps might be monitoring the trend in the number of children attending monthly weighing sessions (assessment), investigating the reasons for declining attendance (analysis), and developing a plan with community leadership for improving attendance (action).

» In surveillance for policy and planning, the steps might be identifying socio-economic groups with a high prevalence of malnutrition (assessment), investigating the reasons for elevated rates among these groups (analysis), and recommending that appropriate public health or other development programmes should be targeted toward these groups (action).

» In surveillance for timely warning, the corresponding steps might be biweekly agro-meteorological reports (assessment), comparison with historical values and agreed-upon cut-off points (analysis), and recommending that relief interventions should be mobilized (action).

During the late 1980s it became clear that many nutrition surveillance and GMP programmes were less than satisfactory. To understand why they did not work as intended and to find out how to improve them, a number of GMP and surveillance programmes were evaluated during 1990–1992.

Review of nutrition surveillance

UNICEF has supported nutrition surveillance for a good many years. Most recently at a global level this took the form of participation together with FAO and WHO in the Inter-agency Food and Nutrition Surveillance (IFNS) programme. The unsatisfactory performance of that programme, together with a desire to articulate more clearly the place of surveillance in the UNICEF nutrition strategy, led to a review of surveillance projects in nine countries and a series of meetings in 1991–1992 [9]. These activities identified a series of problems facing surveillance in the past and helped to clarify how information strategies at the national level may be improved in the

future. The conceptual basis for the discussions was to view surveillance as a triple-A cycle to assist decision-making at national levels, and to identify the factors that influence the process at each stage. The main findings are summarized below.

There is a notable lack of consensus about what surveillance is, what information it should collect, and how it might assist decision-making. To most, it implies continuing collection and reporting of key indicators to national-level institutions. Beyond that, perceptions vary concerning what indicators should be included, the frequency of reporting, possible sources of data, the types of decisions that should be improved. In many cases there have been no serious analyses of decision-making processes and resource control, which are fundamental to the operation of all information systems.

It is common for surveillance to be focused on monitoring nutrition status (often with clinic-based GMP data) rather than being concerned with the larger aspects of the problem as depicted in the conceptual framework. This amounts to collecting information for assessment but having little or no information for analysis of causal processes and solutions. Consequently, most surveillance systems of this type do not improve decision-making and action.

A related problem is that most surveillance systems are designed either in the absence of an explicit conceptual framework concerning causes or on the basis of a biased conceptual framework that assumes the dominance of one cause over others. The most common example of this is to be seen in food-biased surveillance, which stems from the mistaken (or locally unsubstantiated) notion that lack of food is the primary cause of malnutrition. Unbalanced surveillance systems are often reinforced by donor agency pressure, arising from the fact that there has been little agreement among donors on a common conceptual framework for the causes of malnutrition.

The absence of a shared conceptual framework usually reflects a similar lack of agreement in nutrition-related policy analysis at the national level. This permits a variety of misperceptions to persist in policy dialogue and is a serious impediment to progress. Examples of misperceptions include such beliefs as that protein deficiency is a major nutritional problem; stunting among young children may be genetic in origin rather than a reflection of malnutrition; the four-food-groups approach to nutrition education addresses correctable feeding problems of young children; cash cropping is always harmful to nutrition; national food security ensures household food and nutrition security; and undernourished mothers should supplement the diet of their breast-fed children with commercial substitutes.

It is highly unlikely that key indicators from surveillance can help improve decision-making at the national level as long as misperceptions such as these persist. The weeding out of misperceptions should be a continuing process, deliberately conducted through a variety of professionally designed, well executed communication, education, and information strategies. Most countries do not make such efforts, but they are necessary complements to other information activities such as nutrition surveillance.

As noted, the assessment stage of most surveillance systems emphasizes the collection of data on nutrition status. Moreover, emphasis is often misplaced on precise measurement techniques, rapid transmittal, and data processing without relating these to what is actually needed for the types of decisions being made at the national level. Indicators of food, health, and care are generally given much less attention, in part because it is technically and logistically more demanding to collect them.

Analysis in surveillance tends to be equated with routine statistical analysis of computerized data for the production of regular bulletins. This overlooks the many types of analysis needed in making policy decisions and the institutional context for those decisions. Surveillance in countries tends to concentrate on only a few types of analysis, and the institutional linkages between surveillance and sectoral analysts have been weak or non-existent. Moreover, the technical capacity for many types of analysis remains weak in most countries.

A major weakness in surveillance systems lies in the link between information and decisions. The reasons can be summarized as follows:

- weak methods of communicating information to the decision makers, including emphasis on describing problems rather than proposing policy options;
- lack of accountability for nutrition problems at the national level, with corresponding weak demand for or interest in nutrition-related information and policy options;
- persistent misperceptions about the nature of the problem and how to solve it;
- nutrition problems being embedded within the overall political economy of the country, with corresponding political constraints on taking action;
- complications arising from the multisectoral nature of the problems and the complex institutional context underlying decisions that affect nutrition, directly or indirectly, positively or negatively, intendedly or unintendedly—the entrapment of surveillance within the health sector is a common example of this, but alternative institutional arrangements still face significant obstacles.

The final problem relates to resources. In the evaluation, most countries rely heavily or exclusively on

donor resources for surveillance. They underestimate the significant costs associated with surveillance, notably for training at central and peripheral levels and for system development. Moreover, activities not currently included under most programmes but cited above as reasons for weakness require resources. These include achieving a national consensus on a conceptual framework, continuing strategies to weed out misperceptions, training sectoral analysts in how to consider the nutrition dimensions of their actions, and enhancing professional communication capacities.

In summary, the review of surveillance has identified many constraints: lack of consensus on what surveillance is or should be, lack of a conceptual framework, weak demand for information, underestimated requirements for resources, and complications arising from institutional arrangements. In addition, it has highlighted the importance of political constraints and motivations, misperceptions (or misinformation), some technical limitations on collecting key indicators, and often weak technical capacities.

An approach to developing a nutrition information strategy

A more detailed consideration of the steps involved in the triple-A of a nutrition information system—the three major activities (assessment, analysis, and action) and three major steps of communication—shows that the process can be usefully divided into nine discrete stages, as outlined in table 1. Each of the three major stages is preceded by the receipt of information, making decisions concerning how to accomplish that stage, then communicating information from that stage for use in the next stage. The decision preceding each major stage is influenced by the conceptual framework guiding the information system; it is therefore susceptible to erroneous assumptions or misinformation. The communication step in each major stage is critical to the success of the process and is often a weak link in current systems.

The value of making these distinctions lies in providing a mechanism for identifying the logical steps in the triple-A cycle and a range of influences on

TABLE 1. Assessment of nutrition surveillance systems as a triple-A process

	Assessment
Stage 1	
a. Deciding what to assess	Often limited to measurement of nutrition status (anthropometry). Disagreement on what underlying factors to measure (assess). Often food-biased choices.
b. Assessment	Fragmented assessment done in uncoordinated way in different ministries. Too much reliance on routine administrative systems.
c. Communicating information to analyst	Assessment data often not communicated to many but kept within the ministry or statistics bureau.
Stage 2	
a. Obtaining information for analysis	In general, analysis takes place in the same institution that makes the assessment, which delays analysis of the data by others, for example, universities.
b. Analysis	Generally weak analysis, limited to compilation of aggregates by geographic area, rural-urban, and male-female. Very weak, often distorted or no policy recommendations made.
c. Communicating information to user	Most often done in the form of periodic surveillance reports. Other communication methods neglected; news media seldom used. Reports often unnecessarily complicated.
Stage 3	
a. User obtaining and understanding information	Surveillance information seldom used by decision makers. Reports often too complicated or never studied.
b. Deciding on action	Few conscious decisions made to improve nutrition. If made, seldom based on surveillance information; political factors and peer pressure more important.
c. Producing information for re-assessment	Very few countries have systematic monitoring of the impact of policies, strategies, and programmes.

these steps that should be considered in designing or evaluating nutrition information systems. The nine stages provide the first dimension in an approach to evaluating or designing a nutrition information strategy. Unless each stage is performed well, the whole system will not perform satisfactorily.

A nutrition information system does not operate in a contextual vacuum. It consists of one or several nutrition information systems and the necessary environment that makes them work. The next step is therefore to identify that particular environment. Five critical success factors have been identified for ensuring that the systems work well and should be considered in the evaluation or development of a nutrition information strategy:

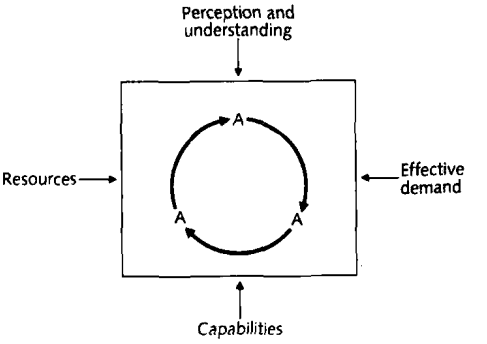

FIG. 3. An information system and factors affecting the system

TABLE 2. Analysis of nutrition surveillance deficiencies

Critical factor	Deficiencies in each stage		
	Assessment	Analysis	Action
Perception and understanding	Low awareness of the nutrition problem. Lack of consensus on the nature/cause of the problem. Myths and misinformation. Malnutrition seldom a priority.	Inadequate knowledge of the causes of the problem. Lack of conceptual framework. Food-biased in analysis. Misinformation and myths.	Lack of consensus about the nature of the problem leads to uncoordinated and sometimes wrong action. Decisions seldom made consciously to improve nutrition. Important decisions often made with negative impact on nutrition.
Effective demand	Low demand for data on nutrition in general. Potential analysts more interested in economic development. Nutrition perceived as of low status among disciplines.	Nutrition problems seldom recognized as a priority development problem. Few development planners and analysts interested in nutrition. Analysis most often made in an isolated cell of the ministry of health.	Most decision makers do not demand nutrition-related information. Most information demanded is food-related.
Capacities	Low capacity to coordinate existing data-collection exercises. Inadequate skills to complement regular nutrition surveys and sentinel surveys.	Inadequate capacity to analyse already existing data. Often weak or non-existent policy analysis. Inadequate communication skills.	Capacity to design and implement actions often weak, in particular regarding how to do things.
Resources of information system	Lack of facilities, staff, and transport. Strong dependence on donor agencies.	Lack of facilities, staff, and equipment. A large part of analysis made by donor agencies with minimum involvement of nationals.	Inadequate management time given to discussing surveillance information. Very little feedback from decisions made.
Resources for action	NA	NA	Generally inadequate human, economic, and organizational resources for implementing proposed actions. Sometimes large resources tied up in expensive nutrition programmes with little impact as a result of bad targeting.

1. perception and understanding of the nature of the nutrition problem—this influences particularly the choice of what to assess and how to analyse it, and what actions are regarded as feasible;
2. effective demand for nutrition-related information and motivation to act—decision makers need information for designing actions as well as for convincing others that the actions are necessary and feasible (creating coalitions);
3. capacity to obtain information from assessment (monitoring) and to use it to analyse and design actions—this refers primarily to technical capabilities;
4. resources to establish and maintain the nutrition information system, including human, economic, and organizational resources;
5. resources for action—when human, economic, or organizational resources are inadequate to implement likely action, the focus must be to mobilize them.

A nutrition information strategy must consider both the information systems per se and the presence of the critical success factors (fig. 3; table 2).

Nutrition information systems may operate at different levels of society. These levels provide the third dimension of the approach to evaluating or designing a nutrition information strategy. Four levels are suggested: individual household, community, district (sub-national), and national.

The stages in the triple-A cycle, the critical success factors, and the level of society create a three-dimensional space in which a nutrition information strategy can be evaluated or designed. Normally a strategy is dealt with at a particular level of society, which makes it possible to focus on the first two dimensions for each level. Table 2, based on these two dimensions, provides the core tool in the approach used in the systemic evaluation and design of a nutrition information strategy. In the broadest sense, the all too frequent failures of nutrition surveillance can be explained by the fact that attention has been limited to developing information systems instead of to designing and implementing an overall strategy.

A nutrition information strategy must deal with information for two major reasons. First, the information system itself requires information. Second, information is required to establish or strengthen the five critical success factors. In both cases the choice of communication method and the source of information are important. To satisfy both needs, different communication methods and sources of information may be used. Some examples of methods and sources are shown in table 3.

An existing body of knowledge is a large and important category derived from people's own knowledge, policy research, theory, expert panels originating nationally, regionally, and internationally, conventional wisdom, and many other sources.

TABLE 3. Communication methods and sources of information

Sources of information	Communication methods
National surveys	Newspapers
Sentinel surveys	Radio, television
Sentinel surveillance	Policy memos
Rapid assessments	Executive reports
Operational research	Technical reports
Special studies	Newsletters
Case-studies	Seminars and workshops
Evaluations	In-service training
Administrative systems	Formal education
Management information systems	Short courses
Speeches	Consultant reports
Existing bodies of knowledge	Films, videos
One-to-one discussions	Animation
Focus-group discussions	One-to-one discussions
Dialogues	Focus-group discussions
	Dialogues

A nutrition information system normally consists of rules about who should assess and analyse what data, when, and how; how information should be communicated among assessment, analysis, and action; who the decision makers are; and so on. The design of such a system should be demand-driven, following a set of consecutive steps:

1. Have a rough understanding of the prevalence of the problem and the major causes.
2. Identify what major actions are required to prevent and control the problem.
3. Identify who takes/should take decisions for action.
4. Identify what information is required for these decisions.
5. Identify what data should be collected for this information.
6. Identify what sources of data are required.
7. Decide on who should collect the data and who should analyse them.
8. Identify the best communication methods to be used from assessment to analysis and from analysis to action.

The choice of communication method is very important. Ten lines in a major newspaper may sometimes influence a senior-level decision maker much more than a 300-page consultant's report. Often participation increases the efficiency of communication through, for example, animation, in-service training, and one-to-one discussion. The gap between the availability and the accessibility of information is to

a large extent a result of inappropriate communication methods.

The type and quality of information required determine the degree to which new sources of information have to be established. The communication methods chosen will determine the resource requirements. The specific needs for additional human, economic, and organizational resources should be estimated.

As stated earlier, nutrition information systems do not exist in a vacuum. They work only if they are both technically well designed (as a system) and are supported by an environment that ensures the presence of key success factors. These success factors can be established or strengthened by well chosen communication methods, using the best sources of information.

In general, a mixture of communication strategies is recommended. Each strategy may use a combination of communication methods. In UNICEF four communication strategies have been applied extensively: advocacy, social mobilization, education and training, and programme-support communication. Advocacy may, for example, require a combination of newspapers, videos, and high-level workshops, each taking information from a range of sources.

Objectives of a nutrition information strategy

A nutrition information strategy should have the following three objectives: improved decisions about targeting of nutrition-relevant services (service delivery); improved decisions on the use of existing resources for nutrition improvement (capacity building); and improved availability and access to resources for nutrition improvement (empowerment). The strategy may address all three objectives, but the relative importance and feasibility of each can only be determined in a particular context. Most often each of the different objectives calls for a different mix of the four major communication strategies. Programme communication is most important for the first objective and education and training for the second, while the third objective often requires advocacy and social mobilization.

Designing the proposed nutrition information strategy

The development and design of a nutrition information strategy should itself follow the logic of the triple-A process. The current use of information for decisions that influence nutrition should first be assessed, and then environmental factors explaining weaknesses in current systems and practices should be analysed. On the basis of the assessment and the analysis, the strategy can be designed.

Assessment of nutrition information systems as a triple-A process

The purpose of the assessment is to identify key decisions that are currently taken that influence nutrition and to determine how well the existing information systems represent a complete triple-A process. The first step to be taken at any level of society is a decision audit/user survey. It should address the following types of questions:

» Based on the most recent situation analysis, what are the major nutrition problems (type and prevalence by age, sex, geographic area, and socio-economic group and trends) and what are the most important immediate, underlying, and basic causes?
» What are the most obvious and feasible actions to address these causes?
» What decisions are required for these actions?
» Are such decisions taken or not? For each important decision-making situation, identify whether or not a decision was made and whether or not sound information was available. The matrix in figure 4 shows four possible results:
  (i) ideal situation—decisions are taken based on sound information, e.g. legislation on a code to protect breast-feeding in a country where aggressive marketing contributes to a decline in breast-feeding;
  (ii) dangerous situation—decisions are taken based on inadequate or wrong information, e.g. increased food production without any data on household food security;
  (iii) common situation—no decision is taken because of a lack of sound information, e.g. whether or not to subsidize a particular cereal when no data exist on who consumes that cereal;
  (iv) unethical situation—no decision is taken despite available sound information, e.g. salt-iodization is not legislated despite a high prevalence of IDD and few salt producers.

Sound information available?	Decision made?	
	Yes	No
Yes	Ideal situation	Unethical situation
No	Dangerous situation	Common situation

FIG. 4. Decision-making situations

Situations where sound information was available should be assessed in detail to understand why decisions were sometimes made while other times they were not made. A step-by-step assessment following the stages in a triple-A cycle can be used.

It may also be important to examine to what extent decisions are taken by the right person and whether or not decisions are taken consciously to improve nutrition. This leads to two questions:

» If a decision is taken, who takes it at present? Whether or not a decision is taken, who should take it?
» If a decision is taken at present, is it taken consciously for nutritional improvement and does it have an impact on nutrition?

Analysis of the presence of critical success factors

The objectives of a nutrition information strategy are to improve decisions and to mobilize resources. The ideal is that correct decisions should be taken consciously for nutritional impact based on sound information. The assessment provides an insight into weaknesses of current systems or practices and should be used for the improvement of existing nutrition information systems or the design of new ones. In both cases it is recommended that a limited set of decisions that are required for addressing the most important causes or actions should be selected and analysed.

As discussed earlier, a nutrition information system works if, and only if, it constitutes a full triple-A cycle. Table 2 can therefore be used for each such system in order to analyse the presence or absence of success factors. In other words, each system should be analysed from the following five perspectives:

1. What are the decision maker's perceptions and knowledge of the nature of the nutrition problem? Do they involve any biases or myths?
2. Does the decision maker insist on receiving nutrition-relevant information? Is this individual motivated, or do political or other constraints make him or her less motivated?
3. Do the people involved in the nutrition information system have adequate technical capabilities to assess and analyse the nutrition problem and design actions relevant to accessible resources?
4. If a nutrition information system exists, are there adequate human, economic, and organizational resources available to sustain it?
5. Does the decision maker control resources adequate for the likely actions decided on?

All decisions require information, and most decisions can be improved by more precise, valid, and timely information. The form in which information is communicated also affects the quality of decisions. It is, however, important to define the optimum precision, validity, and timeliness of information. Decisions can often be based on trends and ranking that require much less precise data on nutrition status than is required to decide on actions for an individual child. Decisions about salt iodization can be made on less precise information about goitre prevalence and do not require information about thyroid-stimulating hormone levels. Some decisions are best made annually, others daily. Information does not need to be collected and compiled more often than decisions are made.

When the type and quality (precision, validity, and timeliness) of information needed have been agreed on, the best sources of information should be identified. Existing sources of information should be reviewed first. Sometimes new sources have to be developed.

Action to design or redesign a nutrition information strategy

On the basis of the assessment and analysis of the current situation, a nutrition information strategy can be improved or developed. Such a strategy consists of one or several nutrition information systems and the establishment of the success factors that are necessary for these systems to work. Normally each level of society benefits from slightly different types of systems.

The design of a nutrition information strategy can be divided into two parts. The first part deals with the nutrition information system, and the second consists of actions required to make the system work. The design should address all technical aspects of the triple-A cycle. The assessment and analysis of the current situation identify what causes should be addressed by what decisions and the information required for these decisions. This answers the question of what to assess. The following steps are recommended:

1. Identify the best sources of this information (review existing sources and create new ones).
2. Develop appropriate methodologies for obtaining data for this information.
3. Identify who should make this assessment.
4. Identify the best way to compile this information and communicate it for analysis.

Depending on how the information from the assessment is communicated, several people and institutions may analyse it. Most nutrition information systems establish one group to conduct the analysis. This is probably necessary in most cases, but it should not mean that this group monopolizes the analysis of information. Sometimes more detailed analyses can be made by research institutions. The following steps are envisaged:

1. Identify who should or could conduct the analysis.

2. Identify the best form and method for the results of the analysis to be communicated to the targeted decision makers. This refers to the choices of communication method described in table 1.

The assessment and analysis of the current situation identify who should take those decisions that would improve nutrition.

The second part of the design consists of systematically addressing the success factors necessary for the system to work that were found to be weak in the analysis of the current situation. Some general recommendations for each success factor follow:

1. *Improve perception and knowledge.* If the problem of malnutrition is not perceived as a priority social problem, decision makers, in particular politicians, are unlikely to act. Perceptions are often determined by pre-existing knowledge (including awareness of the existence of the problem and its consequences), beliefs, values, and experience. Perceptions and knowledge are most important as far as the decision maker (for action) is concerned, but it is also important for the people who assess and analyse. The assessor, analyst, and actor constitute three targets for information. Each of them can be influenced by a different mix of information strategies and methods (e.g. mass media, reports, workshops) depending on local context.
2. *Increase the effective demand for nutrition-relevant information.* This refers primarily to decision makers who control resources for action and advocates for resource mobilization. Sometimes decision makers may be aware of the problem and have the correct perceptions and knowledge, but refuse to act because they are not motivated to do so. This is because it is not good politics to act, or they have not managed to create coalitions that are strong enough to support a new political initiative. Therefore, two types of information are necessary: for correct action and for convincing others that action should be taken (coalition building). Again, depending on the local context, different mixes of information methods are most effective in strengthening this success factor.
3. *Improve the capacity to assess, analyse, and design resource-relevant actions.* The technical capacity to assess and analyse the problem of malnutrition is often weak. Formal education, in-service training, seminars, workshops, and short courses are normally the best methods to improve the situation. The capacity to design actions requires special attention. The actions must address the major causes; be resource-relevant and politically feasible; combine support for delivering service, building capacity, and empowerment in an optimum way; and strengthen and establish new triple-A processes for gradual sustainability. Designing actions does not consist only of defining what has to be done by whom, when, and where, but also how it should be done. The last has been neglected in most training, which probably explains why so many well designed projects never take off or show poor results [10].
4. *Ensure adequate resources for action.* Actions to improve nutrition require human, economic, and organizational resources. A realistic estimate of these must be made and compared with an estimate of available and accessible resources and those that can be mobilized. It is important to recognize that the resources required to solve the whole problem might be perceived as unrealistic, whereas resources to solve half of the problem can be mobilized. When half of the problem is solved, the climate is more conducive to mobilize resources to address the whole problem.

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Nutrition surveillance: A planners' perspective

Soekirman and Darwin Karyadi

Why nutrition surveillance?

In the mid-1970s, when we in Indonesia looked for an instrument that could be used to predict the possible occurrence of periodic food shortages that affected nutrition status, we were unaware of any activity or programme that could meet our need. What we were looking for was an instrument or system to provide early warning information for prompt action before serious malnutrition became prevalent.

Why did we need an early warning system? Until the early 1980s periodic food shortages in several areas of some Indonesian provinces led to a high frequency of acute protein-energy malnutrition, known as hunger oedema in adults, particularly pregnant women and the elderly. The disorder was common under colonial governments and in the early stages of independence. However, after self-sufficiency in rice was achieved in 1985, the government could no longer tolerate such food crises without early and prompt action by local authorities to minimize their negative effects. In particular, policy makers and planners at the National Development Planning Agency (BAPPENAS) were uneasy whenever they read reports on victims of starvation. "This should not have happened. Something must have gone wrong," they complained.

In a staff meeting in the late 1970s, the lead author was asked whether any health or nutrition technique or system could be used to predict the possible occurrence of food shortage so that early action could be taken. In response to this challenge, efforts were made in 1979 to develop an early warning system for food availability and consumption at the household level in villages prone to food crisis.

An information system was developed with technical assistance from Cornell University, with the following criteria, established by policy makers and planners from BAPPENAS:

1. Information should make it possible to prevent malnutrition epidemics during times of food crisis.
2. The information should be easy to collect and process and should be available promptly to various levels of government administration and the local community for making policy decisions and developing action programmes.
3. The information should not be developed as a completely new system but should attempt, as far as possible, to use data and information already available at the local level.
4. The system should be designed so that the information could be collected and processed by the local government and the community. In other words, from the beginning the system should belong to the local authorities at the subdistrict level and to communities.
5. Since the information should serve as a monitoring mechanism for higher level government administrators (province, central), it should be communicated to them promptly without creating an additional reporting mechanism.

These criteria represent a planners' perspective for an information system for Indonesia that is now called the nutrition surveillance system (NSS). It is worth noting that the initiative to develop this system in Indonesia came from policy makers and planners, because the system should facilitate prompt actions and these parties were very much concerned about such actions. An advantage of policy makers and planners being involved early in the development of an NSS is the assurance that funding will be available for promptly taking actions indicated by the system.

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What is the nutrition surveillance system?

After considering what the policy makers and planners needed in such a system, we tried to define the scope of the NSS for Indonesia. First, it had to function as a timely warning and intervention system (TWISS), a system to link problem-prone areas (districts, subdistricts, villages) with higher authorities at provincial and central levels, provide indicators that act as early detection mechanisms for food crises, and guide prompt actions to cope with declining food availability and consumption, particularly among poor households.

As a TWISS, the NSS is aimed primarily at government officials who have the authority to mobilize resources to deal with declining household food availability that may arise because of higher food prices, crop failure, a decline in market supplies of food, especially rice and other staples, and high peaks in unemployment. In Indonesia, these government officials include the village head, who is elected by the people, the subdistrict head, who is an appointed government official at the lowest level, the district head, who is appointed by the central government but elected by the district parliament, the governor as head of the province, and certain ministers and ministries at the central level.

The definition of an NSS depends on the users.

For the village head, it is a first-hand information mechanism indicating the people's well-being. If data show an immediate problem, the village head may call for an urgent meeting with the village council. The council is a community organization representing the needs and concerns of the people as brought to the attention of the village head or others.

The subdistrict head cannot take action alone, having no authority to mobilize resources, but forwards NSS information to the district head with a proposal for solving problems through prompt action.

The district head may use NSS information to instruct various sectoral agencies to take action, with or without authority from the provincial or central levels. These agencies are primarily the local Rice Logistic Agency for local market operation to secure rice market supplies so that prices can be controlled in favour of both the producers (farmers) and consumers, the Office of Agriculture for agricultural inputs or information, the Office of Manpower Agency for labour-intensive operations, together with other agencies to provide short-term employment, and the Office of Health Service for appropriate health and nutrition services.

High-level authorities use TWISS information to monitor local food and nutrition problems. Such authorities can be found within the ministries of Internal Affairs, Agriculture, and Health (primarily the Division of Nutrition), as well as the National Rice Logistic Agency, which became a Ministry of Foods in the new cabinet (starting in 1993) with a coordinating function for supply-side (input) nutrition.

Does the NSS work in Indonesia?

In certain areas, especially in some subdistricts on Lombok Island in West Nusa Tenggara province, the NSS had effectively been in operation as a TWISS for eight years (1981–1988) when rice cultivation was still based on a local traditional farming system with a low production capacity. During the third five-year plan, starting in 1978, a massive agricultural programme to increase production through a nationwide "green revolution" was implemented in the province. As a result of this programme, the people began to benefit by the mid-1980s. Since then, the province has completely changed from having an insufficient rice supply to exporting significant amounts of rice to other provinces while retaining rice self-sufficiency. As a result, periodic food shortages no longer occur, and there has been no report of acute malnutrition among the adult population.

Local government officials and the people then lost interest in the TWISS, largely because the food shortage was resolved. This also happened in other provinces, and interest rose only when the food situation became vulnerable once more or when an area was considered to have an inadequate supply of food, especially of rice. In such instances the objective of the NSS emphasizing timely warning and intervention was reassessed and shaped into a general nutrition-monitoring system.

The NSS revisited: The planners' perspective

From the planners' point of view, since Indonesia has achieved self-sufficiency in rice and no acute malnutrition has been reported, the continuation of the NSS has become debatable. This is contrary to the opinion of nutrition specialists, who believe that the NSS should be continued even in areas of food and rice surplus as a part of the process of nutrition programme development. We must continue to educate policy makers and planners on the significance of nutrition-improvement programmes as an integral part of national development. This is not easy, especially since we cannot rely on biomedical or traditional nutrition information to convince these officials. It requires what has been called a nutrition engineer to translate nutrition science into issues of

economic, social, and political development (Alan Berg, personal communication, 1992).

It seems that nutrition has won the game in Indonesia. It was decided that the NSS should be continued but reworked. From 1988 to the present, the definition and scope of the NSS has been broadened to monitor the nutrition status of people in general. For the periodic monitoring of children's nutrition status on a national basis, the design, collection, and processing of data and information are integrated into a National Social and Economic Survey under the General Bureau of Statistics. With this integration, periodic data on weight and age are available for the national and regional levels.* In addition, there are plans to monitor the height of primary-school entrants periodically. The pilot activity was completed in 1990, and the monitoring will be implemented nationwide in the sixth five-year development plan, starting in 1994. Consideration has also been given to using the growth-monitoring data and information collected monthly for children under five years of age in about 67,000 villages, covering almost every child, in the revised NSS.†

The revised NSS is important primarily in that it provides data and information for better, more effective nutrition programmes. It also shows evidence of the positive impact of well-planned programmes.

Conclusion

From the perspective of the planners, the NSS has achieved what they once expected a nutrition programme to do: develop a system that could be put into operation by key sectoral agencies (agriculture, health, home affairs, etc.) to prevent acute malnutrition due to food crises.

If we want to develop the NSS beyond being a TWISS, special efforts must be made through more effective communication and education so that good nutrition can be presented in a more attractive way. It is important that the overall concept of the NSS be relevant to national development priorities. Thus, nutrition personnel who operate the NSS have to be trained beyond the basic science of nutrition. They must understand professional linkages between NSS data and other available information such as socio-economic data from the National Social and Economic Survey in Indonesia. The objectives and the data-collection methodology should be reviewed and updated periodically to be consistently relevant to the needs of development programmes. This happened in the early stage of the NSS in Indonesia, in which a broader concept of an NSS was narrowed down to a TWISS and then was developed back into an NSS.

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