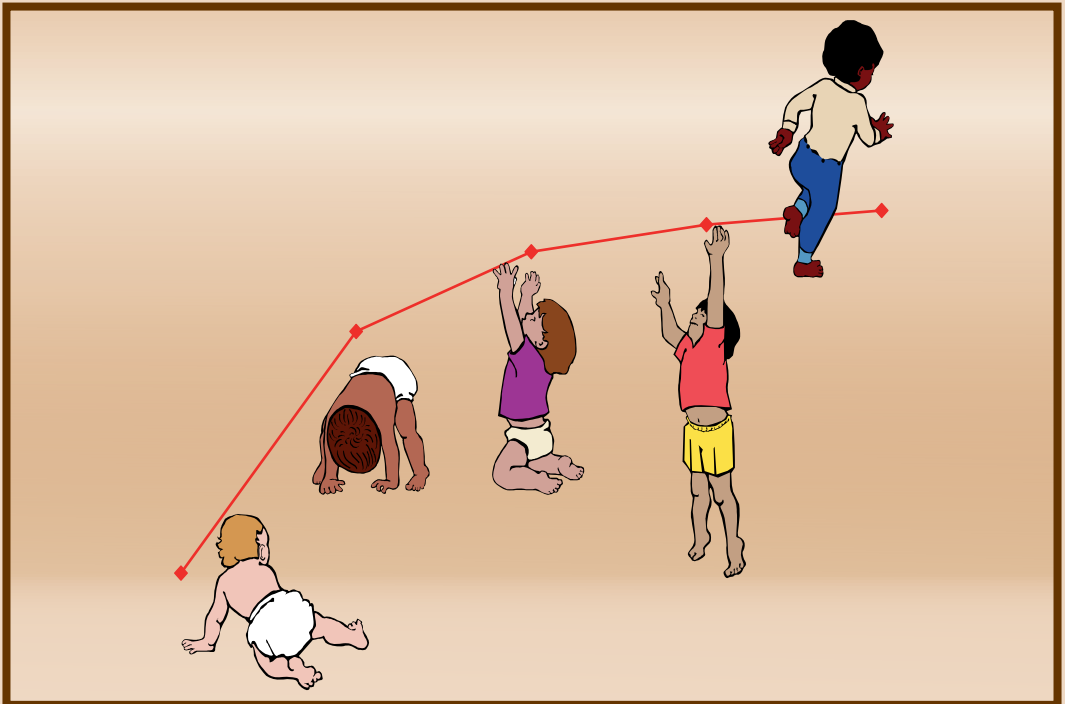


# Food and nutrition surveillance systems

*Technical guide for the development of a food and nutrition surveillance system*



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**World Health  
Organization**

Regional Office for the Eastern Mediterranean

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## Preface

Food and nutrition policies and programmes that improve the health and nutritional status of the population require a strong evidence base and capacity to measure outcomes. To fulfil these requirements there is a strong need for a sustained security food and nutrition surveillance system. The objective of this system is to measure and monitor food and nutrient intakes, food security, nutritional status, nutrition-related health outcomes, as well as knowledge, attitudes and practices on healthy food and other lifestyle factors such as physical activity and healthy environment. This information must be linked to data on demographics, determinants of health, and factors affecting access to safe, affordable nutritious foods.

A food and nutrition surveillance system is an essential instrument for the detection of nutrition and nutrition-related health problems and to follow up on policy implementation for both developmental and emergency programmes. A food and nutrition surveillance system is defined as the regular and timely collection, analysis and reporting of data on nutrition risk factors, nutritional status and nutrition-related diseases in the population. The activity is undertaken to provide information useful in supporting, improving and guiding decisions regarding the need for nutrition interventions and the extent and distribution of nutrition problems in the population.

The objectives of nutrition surveillance are: to describe the population's nutritional status, with particular reference to at-risk subgroups; to explain causal relationships to permit selection of preventive measures; to promote government decisions that will meet the needs of both normal national development and emergencies; to consolidate the most important indicators relevant to food and nutrition and health priorities; to predict the evolution of nutritional problems based on an assessment of current trends; and to monitor nutrition programmes and evaluate their effectiveness.

Prior to implementing a nutrition surveillance system, an initial assessment should be conducted to determine the type, extent and timing of the nutritional problems; to identify and describe groups at risk; to assess the reasons for the presence of malnutrition; and to identify existing data sources that could be useful to the system. This information can be based on data from similar countries, spot surveys, community studies, hospital reports and routinely collected data.

While the use of health indicators such as mortality and morbidity data to monitor the health situation of a country is now common practice, food and nutrition surveillance is not yet established practice in most developing countries. However, a number of countries in the WHO Eastern Mediterranean Region are seriously considering the need for such a system as a prerequisite for a national food and nutrition policy.

Despite WHO's regional efforts since 1980 to encourage Member States to develop food and nutrition surveillance systems, only a few countries have responded positively and initiated such systems; these are still at a primary stage and need enforcement. Surveillance systems in Kuwait, Morocco, Oman and the occupied Palestinian territory are progressing very well, as is the surveillance system in Darfur, Sudan under emergency operations. The most successful system, not only in the Region but also globally, has been established for Somalia by a United Nations country team in Nairobi. However, this is not sustainable as it has been funded and run by the Food Security and Nutrition Analysis Unit, managed by the Food and Agriculture Organization of the United Nations. Nevertheless, the centre could be a good investment and provide training for other Member States.

As indicated in WHO's regional strategy on nutrition and plan of action 2010–2019,<sup>1</sup> nutrition data in the Region are not up to date. Most countries in the Region do not have a functional surveillance system that is able to analyse the nutrition situation and its possible evolution and trends in response to current policies and programmes. In addition, over the past three decades the Region as a whole has witnessed significant social, economic, demographic and political changes that have highly influenced the nature, scope and magnitude of health and nutrition problems, the burden of disease and related risk factors in most of its Member States.

The main objective of this publication is to provide the technical background for the development of a national food and nutrition surveillance system. It will be useful for policy-makers and technical staff involved in nutrition information systems, including ministries of health and agriculture, nongovernmental organizations and other international and national organizations concerned with nutrition early warning systems.

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1 *Regional strategy on nutrition 2010–2019 and plan of action*. Cairo, WHO Regional Office for the Eastern Mediterranean, 2011.

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# Introduction

Although improvements in nutrition have taken place as a result of economic growth and as a natural outcome of health sector development and services, an overview of nutrition programmes in the WHO Eastern Mediterranean Region indicates that the greater burden of malnutrition is associated with inadequate dietary intake and disease. This burden is increasing in many countries. Other countries are experiencing overnutrition due to changing food consumption patterns and lifestyles, resulting in increasing overweight, obesity and noncommunicable diseases.

The nutrition and health problems of today are quite different from those of 20–30 years ago. In some countries, sudden climatic changes have occurred at irregular intervals leading to drought, flooding and famine, while other countries have suffered as a result of war or sudden changes in the world economy on which they depend. Obviously, such factors cannot be eliminated. Food and nutrition surveillance is intended to provide all the necessary information, periodically at varying intervals in time according to the needs in each particular case. The establishment of a surveillance system will enhance the monitoring of both population-specific and Region-specific trends in nutrition-related risk factors and conditions.

The present use of the term “food and nutrition surveillance” started with the recommendation by the World Food Conference, 1974. At the regional level, the first initiative, a WHO/Food and Agriculture Organization of the United Nations (FAO) intercountry meeting on nutrition surveillance, was held in Islamabad, Pakistan in 1988. In September 2009, it was followed by a WHO regional meeting held in the Syrian Arab Republic, with active participation from the Centers for Disease Control and Prevention (CDC), FAO, International Council for the Control of Iodine Deficiency Disorders, Johns Hopkins University, United Nations Children’s Fund (UNICEF), the World Food Programme and representatives from Members States.

A food and nutrition surveillance system is an instrument for the formulation, modification and application of the food and nutrition policy of a country. Such surveillance is intended to provide information on the basis of which decisions are made. The principles of a food and nutrition policy exist in every country and occasionally these are formulated as an official policy. Since such a policy affects several different sectors, a food and nutrition surveillance survey has to collect information from these various sectors and analyse and interpret it as a whole. A surveillance system is only meaningful if it supplies information upon which decisions concerning nutrition can be based. It is essentially a practical part of the machinery by which a government

may safeguard the nutritional status of its population and is not intended purely for research or academic purposes.

Adequate nutrition, a prerequisite for good health, depends on many factors that intervene in the relationship between food and health. Accurate and relevant information is generated from the periodic and systematic measurement of some of these factors. In conjunction with data on population nutrition and health status assessment, this will provide a good foundation for understanding trends in health and nutrition and for taking appropriate action to promote the well-being of populations.

Information is also needed to provide early warning of impending nutritional emergencies and for on-going programme management. In order to be utilized efficiently, the information must be: timely; relevant to the decision-makers; and communicated effectively at the appropriate levels.

WHO at a global level, and involved institutions at the regional level, are focusing on the following elements to be considered throughout the ongoing programme:

- updating the concepts and improving the methods of global nutrition surveillance;
- conducting surveillance during conflict and crises;
- improving the coverage of food and nutrition surveillance systems;
- providing technical support to conduct food and nutrition surveys;
- improving the quality and use of collected data;
- implementing the WHO Child Growth Standards (2006) throughout the world;
- encouraging the integration of the growth standards and references into health programmes.

Finally, a food and nutrition surveillance system is based on the regular collection of data. These data are analysed to define indicators of present or future change of nutritional status. The types of information from which indicators can be devised cover a broad range. Information and classifications used in this technical guide are intended to be miscellaneous, so that Member States have the flexibility to select the most suitable indicators, as they differ in their requirements for planning, need for information and sources of data. Although a single design for all surveillance systems is neither feasible nor desirable, some principles, examples and characteristics of systems are presented in this technical guide based on available resources and phases of implementation. The WHO Regional Office for the Eastern Mediterranean is committed to providing constant support and the required tools to its Member States to help scale up nutrition and food security, in line with the regional nutrition strategy.

# I. Food and nutrition surveillance systems

## Definition

A food and nutrition surveillance system is a mechanism to transfer food and nutrition data into action through formulation, modification and application of the food and nutrition policy of a country.

## Goal

The overall goal of a food and nutrition surveillance system is to provide regular and updated information on the nutritional conditions of a population and the influencing factors. This information will provide a basis for decisions made by those responsible for policy planning and the management of programmes relating to improvement of food consumption patterns and nutritional status.

## Objectives

The immediate objectives of a food and nutrition surveillance system are:

- to describe the nutritional status of the population, with particular reference to defined subgroups who are identified as being at risk; this will permit description of the character and magnitude of the nutrition problem and possible changes in these features;
- to provide information that contributes to the analysis of causes and associated factors and therefore permits a selection of preventive measures, which may or may not be nutritional;
- to promote decisions by governments concerning priorities and the disposal of resources to meet the needs of both “normal development” and emergencies;
- to enable predictions on the basis of current trends in order to indicate the probable evolution of nutritional *problems*. Considered in conjunction with existing and potential measures and resources, these will assist in the formulation of policies;
- to monitor nutritional programmes and to evaluate their effectiveness.

In emergency settings, the objectives specifically focus on the following:

- *A warning system*. This is used as a means of highlighting an evolving crisis.
- *Identification of appropriate response strategies*. These may include non-food as well as food assistance to address the underlying causes of malnutrition.

**Table 1 Aims of a food and nutrition surveillance system**

Purpose	Time-frame	Type of information required	Leading sectors
Warning system of nutritional emergency	Short term	Food availability Early effects on nutritional status	Agriculture Meteorology Livestock Food Health
Trends of malnutrition over a number of years	Medium to long term	Change in nutritional status Trends in economy and agriculture	Health Economic Agriculture
Trends in nutritional effects of affluence	Medium to long term	Change in nutritional status Morbidity and mortality from specific diet-related diseases	Health Food

Source: (1)

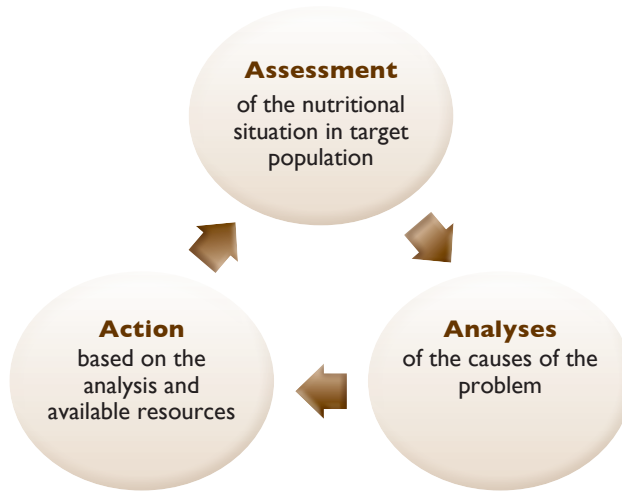
- *Triggering a response.* Nutrition surveillance systems provide a trend analysis focusing on the magnitude of change. This may trigger an in-depth assessment, which in turn may lead to a response.
- *Targeting.* Nutrition information can help target areas that are more at risk or in greater need of assistance.
- *Identification of malnourished children.* Some forms of surveillance can identify acutely malnourished children.

According to the timeframe and the type of information required, the aims of a food and nutrition surveillance system can be grouped as indicated in Table 1.

## Function and scope

The food and nutrition surveillance system is an instrument or tool used to generate information that is very helpful for the formulation, modification and application of food and nutrition policies of a country. Such surveillance is intended to supply information on the basis of which decisions are to be made.

Many nutrition surveillance systems have been established to obtain data on the overall nutritional status of a population without making provision for information on the underlying causes of nutrition problems (Figure 1). A multisectoral view of nutrition and food surveillance was clearly set out by the World Food Conference 1974, which defined the scope of surveillance as “a wide range of information on all factors that influence food consumption patterns and nutritional status”. Given this point of view, nutrition surveillance will usually require data that go beyond those nutritional, economic, sociocultural and biological determinants.



Source: (2) modified

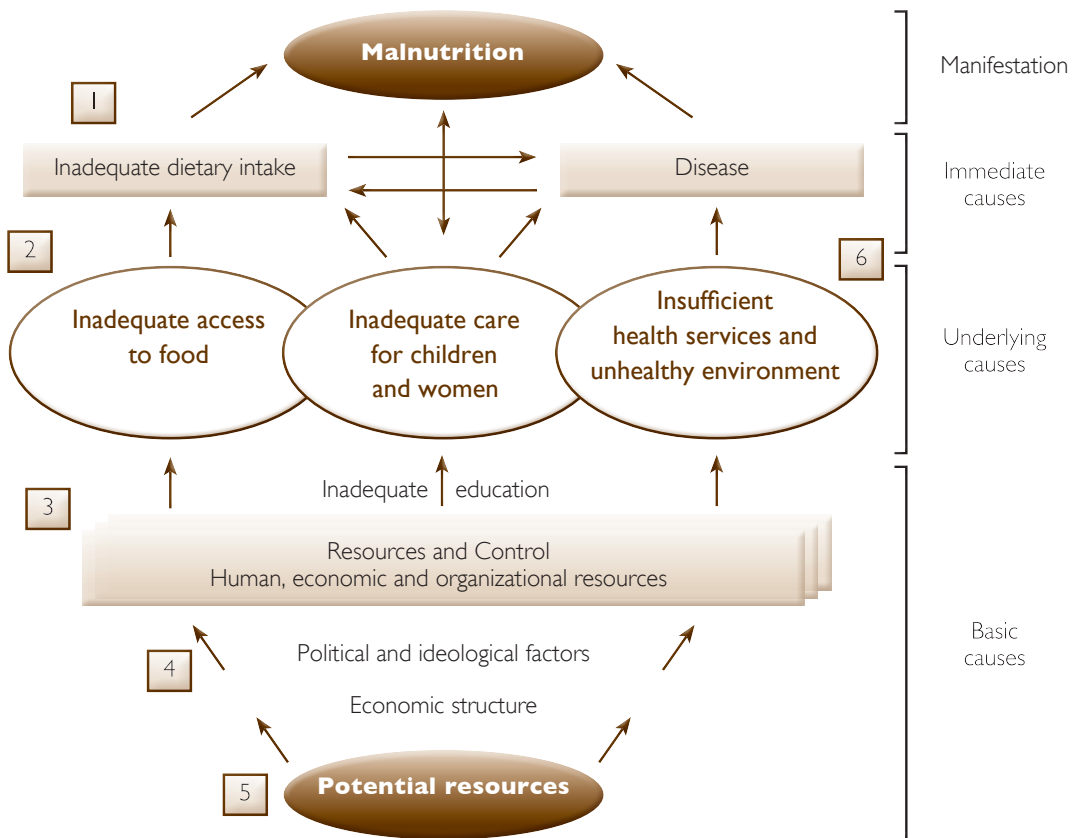
**Figure 1 Triple-A cycle diagram addressing nutrition-related problems**

## Major determinants of nutritional status

The nutritional status of a population is affected by a number of variables, such as food production and availability, purchasing power, dietary practices and intake, disease patterns and other related factors. These factors can be arranged in a causal sequence or model (Figure 2).

Malnutrition may be caused by not eating the right amount or right kinds of food, or by having certain health conditions. It can be also caused by diseases of the gastrointestinal tract, such as maldigestion and malabsorption, where ingested food is poorly, if at all, utilized. Further causes of malnutrition are increased energy and nutrient requirements owing to disease, or increased loss of nutrients because of diarrhoea, bleeding, etc.

With further information, models could be developed that concentrate on factors affecting nutritional status, such as the interactions between malnutrition and infections, sanitation or water supply. The simplified list in Figure 2 (1–6) gives useful advice for planning a surveillance system.



1. Nutritional status depends on the dietary intake of food and nutrients as well as disease.
2. The dietary intake or food consumption of a family or a person depends on the food available to the family and on the nutrition awareness in the family.
3. Food availability depends: (a) on the relation between food prices and earnings in a market economy; (b) on the food harvests in subsistence households; and (c) on both the price–wage relationship and on production in mixed market and subsistence households (the exact relationships between these factors and food availability in a mixed household economy are not usually known and are difficult to determine).
4. The relation between food prices and earnings is largely influenced by imports or food aid.
5. Local food production is influenced by many interrelated factors, both inside and outside the country (e.g. the weather).
6. Food utilization depends on the physiological status of the human body which, in turn, is influenced by the environment, accessibility to safe water, and the morbidity status which itself results from inadequacies in the environment and water and sanitation situations.

Source: (2) modified

**Figure 2 Causes of malnutrition**

## Functions

A food and nutrition surveillance system involves a continuous process of comprehensive multisectoral data analysis and interpretation and has a variety of functions as described in detail below.

### National and sectoral planning and policy design

Planning at the national level usually consists of a periodic review of government policies and defining medium- and long-range goals that will contribute positively to designing or adjusting such policies. This requires a multilayered vision of food and nutrition problems that goes beyond any single sector. The role of a surveillance system is therefore to provide continuous analysis, integration and interpretation of data from multiple sources, ensuring a systematic flow of information from different sectors. This analytical process should be both inductive and deductive and should be integrated, rather than just culminating in the presentation of a compendium of multisectoral data. In this way, an appropriately planned and established surveillance system will support high-level decision-making through analysis and interpretation of sectoral data.

### Programme monitoring and evaluation

Food and nutrition programmes can potentially make an important contribution to the food security of vulnerable populations. Such “safety net programmes” usually have earmarked financial resources from the social fund or from the donors in countries with emergency-based operations that address vulnerable groups at risk. Measuring the impact of food and nutrition programmes and their efficiency is important to both political and management leaders. Thus, subsystems of data collection and analysis are essential and must be integrated into the surveillance system. The surveillance system should include an information management system that routinely collects and analyses programme- and population-based indicators and evaluates the success or failure of such programmes.

### Problem identification and advocacy

Advocacy can either be undertaken by sectoral groups within the public sector or by nongovernmental organizations serving vulnerable group or disadvantaged populations. The surveillance system may also be of use to community groups and other organizations by giving them access to resources and providing situation analysis supported by data that will help increase the flow of resources to support food and nutrition activities from the government and donor communities. It also assists in

setting priorities for targeting resources to the most “needy” people from deprived communities or subgroups. In addition, a surveillance system serves as evidence to support advocates’ policy or programme proposals. Advocates’ claims benefit from the efficiency, accountability and transparency of the system and their impact is thereby strengthened and more able to attract key partners.

## **Timely warning of food shortages**

An early-warning system is an efficient tool in disaster management. The Region has recently been affected by different crises, such as high food prices, climate change, unexpected floods and droughts, and man-made disasters. Timely warning systems can be powerful tools for preventing critical food shortages and sudden decrease in access to basic foods in affected countries.

Warning systems routinely analyse multisectoral information (e.g. food stocks, market prices, agro-ecological factors, food insecurity) and provide periodic assessments of the risk of central and local shortages. This information must be closely linked with a decision-making process to enable a rapid response, otherwise the information serves no purpose. Data generated must be effectively integrated with decision-making as rapid action is required. Without such integration, there is little justification for timely warning systems.

## **Monitoring effects of structural adjustment policies**

Structural adjustment policies are prescriptions to reduce government regulations and spending and to increase government earnings and repayment of international responsibilities. The value of these policies, established during the 1980s, has been discussed widely. It has become clear that the effects of such policies on food security and the nutritional status of the population must be carefully examined and monitored. In particular, it is essential to monitor the effects of these policies on food security of the poor in order to provide feedback to policy-makers with the aim of strengthening positive effects and mitigating negative ones.

## **Methods**

### **Normal situations**

The following common methods are recommended for establishing a food and nutrition surveillance system under normal conditions.



## Large-scale food and nutrition surveys

The surveillance system should make an inventory of all large national surveys related to health, food and nutrition that could act as a basis by breaking data down at subregional, district and village levels. In particular, frequent surveys such as the Demographic Health Survey, National Nutrition Survey or National Food Security Surveys should be considered. Try to include selected nutrition indicators.

## Repeated small-scale surveys

Repeated small-scale surveys are population-based surveys that use standard methods to collect quantitative and qualitative data. They assess the type, severity and extent of malnutrition and its causes among a representative sample of the population (children and/or adults). Their purpose is to support policy-makers and managers to design strategies and prioritize geographical areas at risk and specific types of interventions. Repeated surveys include national surveys, which are periodically conducted at national level, and small-scale surveys, which are carried out at local level to gather nutrition information at a suitable time.

## Sentinel site surveillance

Sentinel site surveillance involves surveillance in a limited number of sites to detect trends in the overall well-being of the population. The sites may be specific population groups or villages that cover populations at risk. Trends are monitored for various indicators, including nutritional status, morbidity, dietary issues, coping strategies and food security. Data can be collated and analysed centrally (centrally-based sentinel site surveillance) or by trained members of the community (community-based sentinel site surveillance).

## School census data

Nutritional assessment is occasionally undertaken in schools, where first-grade children are measured through censuses every two to three years. The objective is to identify high-risk children with poor health, malnutrition and low socioeconomic status. Results can be used to target school feeding programmes and support policy-making in food-based strategies. The need for monitoring obesity among school-aged children is becoming more important. School census data, supported by information on specific food consumption patterns, marketing of healthy food and information on physical activity levels, are very important to understand the main causes of obesity.

## Growth monitoring

Growth monitoring is a continuous monitoring of growth in children. Its aim is to identify slowing or faltering of growth at the individual level, and thus help to correct the problem promptly. Formerly, growth was usually measured as weight for age once per month. However, the WHO new growth curve (weight/height or length) is now recommended. Growth monitoring can either be conducted by health professionals at maternal and child health clinics (clinic-based growth monitoring) or by trained members of the community in villages (community-based growth monitoring).

## Emergency situations

In emergency situations, data and information on the populations and groups at risk are needed rapidly. The Joint United Nations Nutritional Cluster Surveys therefore offer the preferred methods.

Sentinel site monitoring is particularly useful for early-warning purposes and can pick up trends quickly. These trends can act as triggers for conducting nutritional surveys to determine more accurate levels of malnutrition.

In an emergency setting, additional sources of data can be obtained from:

- rapid nutrition assessments;
- rapid screening based on mid-upper arm circumference.

There is no single prescribed method for nutrition surveillance systems in emergencies. Often a variety of nutrition information sources are used, depending on the context and what is appropriate, available and feasible. The best methods use representative data collected from the population.

## Challenges

The most important aspect of a food and nutrition surveillance system is to ensure effective links between information and action. But the reliability of data, timeliness of reporting, efficient action management and sustainability are all challenging. A further challenge is interpreting the findings. Similar levels of acute malnutrition may have different significance, depending on the context. Unless the underlying causes of nutritional disorders are understood, the appropriate response may not be provided.

## Sustainability

One of the biggest challenges is ensuring effective continuity of the system. One of the main reasons for the failure of surveillance systems in the past was that national or local governments were unable to provide the resources needed to maintain them.

When establishing a nutrition surveillance system it is essential to consider and plan for long-term sustainability, especially in areas where there is a high probability of prolonged crisis. Ideally, if a system proves to be effective and sensitive in monitoring change over time, there should be no difficulty in justifying long-term resource provision. An accurate early-warning mechanism that triggers a response is far more cost effective than having to support a full-scale humanitarian response to a nutritional emergency.

## **Institutionalization**

Institutionalization, including accommodation of the system and links with existing early-warning or health information systems, can also be problematic. A risk for many information systems is relying on a range of information sources that cut across several government ministries, including health, agriculture and education. This means that no specific ministry takes responsibility for the management of the system and over time it may become uncontrolled.

## **Linking information to action**

Linking information to action is very important. Collection of data that is not linked to action is meaningless. Therefore, surveillance systems should be designed to maximize the probability of response, if one is needed. This requires consideration of the ideal institutional location for the system, as well as consideration of dissemination channels for information and the setting in which the analysis will be presented. Involvement of decision-makers in the design and development of an analytical framework for using the information will strengthen the credibility of the system and, as a result, the probability of a response where necessary.

## **Uses and users of surveillance information**

As there are many factors leading to malnutrition, such as socioeconomic status, potential users of nutrition surveillance information are found in various sectors (Table 2). Although it is unrealistic to expect nutrition to play a leading role in decisions on overall resource allocations, nutrition surveillance can be used to analyse policies for nutritional consequences, suggest alternative nutritional policies and eventually to assess their effects. There is an advocacy role for long-term nutrition surveillance in helping other similar methods trying to detect the fundamental causes of malnutrition. However, surveillance probably has the most potential for bringing about policy changes that are favourable to nutrition with reference to specific, selected issues. These issues may often be less fundamentally related to the basic causes of malnutrition, such as

**Table 2 Stakeholders of food and nutrition surveillance data**

Stakeholder	Purpose
Government	<i>Nutrition:</i> national food and nutrition guidelines, nutrient reference values, nutrition goals and targets, nutrition strategies (e.g. Healthy Eating – Healthy Action), purchasing services <i>Health:</i> health strategies (e.g. chronic disease, inequalities, population subgroups), purchasing services, health promotion, advice for higher health authority <i>Food:</i> development, monitoring and enforcement of food regulations and standards (e.g. food safety, composition and labelling), international food standards (Codex), advice for Food Safety Authority
Health sector	Programmes (e.g. nutrition education, health promotion, food safety) and services, patient advice and education
Nongovernmental organizations	Policies and programmes, health promotion
Academic institutions	Teaching, research direction, data for research
Food industry	Food labelling, food marketing
General public	Information, advice, education

Source: (3) modified

the inequitable distribution of resources, but in reality decisions on them have a better chance of influencing nutritional status.

## Sources of data

Sources of food and nutrition surveillance data can be primary or secondary. Primary data are collected through surveys specifically designed to monitor food and nutrition. National nutrition surveys are the major source of primary data, and provide detailed and specific information on food and nutrient intakes, nutritional status and nutrition-related health status. Ideally, food and nutrition surveillance data should be collected continuously. However, this is not a practical option for most countries, as nutrition surveys are expensive to undertake. Most countries undertake national nutrition surveys on a periodic basis, approximately every 3–5 years up to 10 years, which is considered sufficient to keep up with changes in dietary patterns and new food technologies.

Secondary data are derived from data collected for purposes other than food and nutrition surveillance. Potential sources of secondary data include routinely collected health statistics, household budget surveys, market research surveys, industry surveys and research studies. Issues to be considered when evaluating the value of secondary data sources include the:

- periodicity of data collection (ad hoc, periodic, continuous);
- frequency of data collection (weekly, monthly, yearly);

- level of aggregation (individual, household, national);
- sample size and sampling strategy;
- format in which the data are stored (computer, paper);
- availability and cost of data.

The sources of data for each surveillance element are listed in Table 3.

<b>Table 3 Summary of food and nutrition monitoring domains and data sources</b>		
<b>Sector</b>	<b>Data source</b>	<b>Comments</b>
Food supply	Health economic survey (household) Food balance sheet (national)	Includes national and household food supply
Food consumption	Adult and child nutrition surveys; limited data on selected food groups (e.g. vegetables and fruit) from health surveys	All foods and beverages, including fortified or functional foods, dietary supplements and breast milk
Dietary patterns	Nutrition survey data	Factor analysis or diet quality score (e.g. Healthy Eating Index)
Nutrient intake	Derived from nutrition surveys using food composition tables	Requires maintenance of up-to-date food composition database
Nutritional status	Adult and child nutrition and health surveys	Includes anthropometric and biochemical measurements
Nutrition-related health status	Health and nutrition surveys	Includes incidence and prevalence of ischaemic heart disease, diabetes, obesity, blood pressure, blood lipid profile
Food security	Nutrition surveys Healthy food basket pricing Food bank surveys Benefit statistics	Includes various dimensions of household food security
Food culture	Nutrition surveys Survey of foods consumed away from home Surveys of advertising and marketing	Includes food preferences, food preparation practices, social settings for eating, portion sizes, consumer knowledge, attitudes and behaviours, marketing and advertising practices
Stage of change	Nutrition surveys	Includes intention and attempts to change diet; perceived barriers or facilitators of dietary change
Links to other risk or protective factors	Health and health behaviour survey	Includes drug use (especially alcohol and tobacco), physical activity, infant care practices (i.e. breastfeeding)

Source: (3) modified

## Links with food security, agriculture, health, socioeconomic sectors

### Food security

FAO has defined food security as “a state that assures that at all times all of the population have the material and financial means to obtain the basic foods that they need”.<sup>(4)</sup> This concept has a number of dimensions:

- it covers the whole food chain from production to biological use;
- it applies at the national as well as household and individual levels;
- its aim is permanent security, combining stability with non-dependence on external factors;
- it is dynamic, as food security is a relative and not an absolute goal;
- it is centred on the material and economic attributes of food.

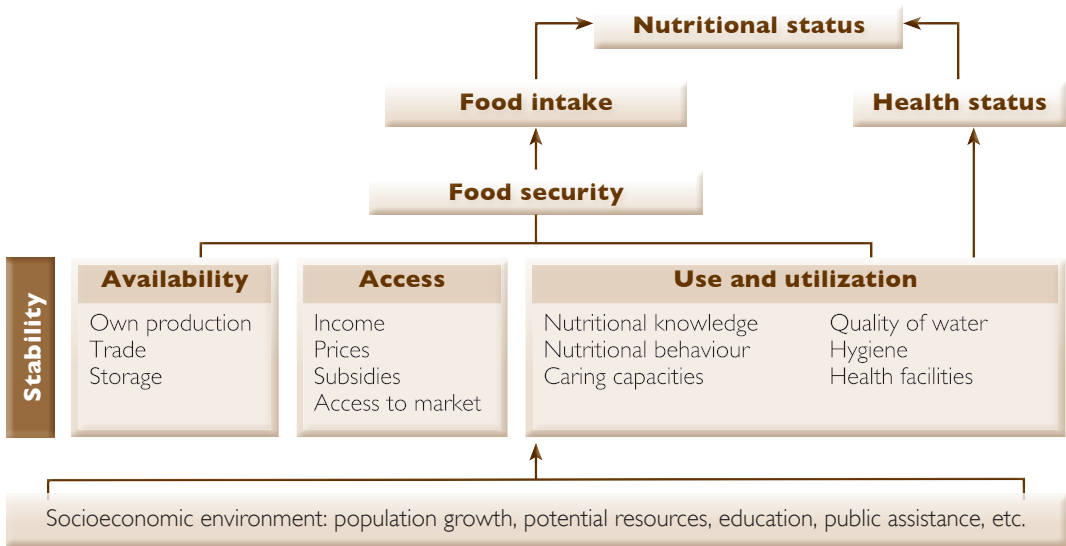
Food security refers to access by all people at all times to sufficient, safe and nutritious food for a healthy and active life. There are three components of food security.

- *Availability.* Sufficient quantities of appropriate food are available from domestic production, commercial imports or food assistance.
- *Access.* Adequate income or other resources are available to access appropriate food through home production, buying, barter, gifts, borrowing or food aid.
- *Utilization.* Food is properly used through appropriate food processing and storage practices, adequate knowledge and application of nutrition and child care, and adequate health and sanitation services.

Food insecurity is one of the main underlying causes of malnutrition as conceptualized in the model below (Figure 3). Insufficient access to food leads to inadequate dietary intake, which in turn can lead to malnutrition. Although food insecurity is rarely the only cause of malnutrition, which in most cases is also accompanied by high disease rates, it has nevertheless a great impact, especially in emergency situations with deteriorating care practices, health, hygiene and sanitation.

Emergency food security assessment is therefore essential when planning interventions to protect food security and prevent potential malnutrition. Interventions include the distribution of food aid or cash and agricultural and economic support.

Food and nutrition security is an ultimate goal of the World Food Summit. International communities are helping developing countries to achieve the Millennium Development Goals through a broad framework of socioeconomic development, involving many sectors at different levels. The food security concept gives the surveillance system



Source: (2) adapted

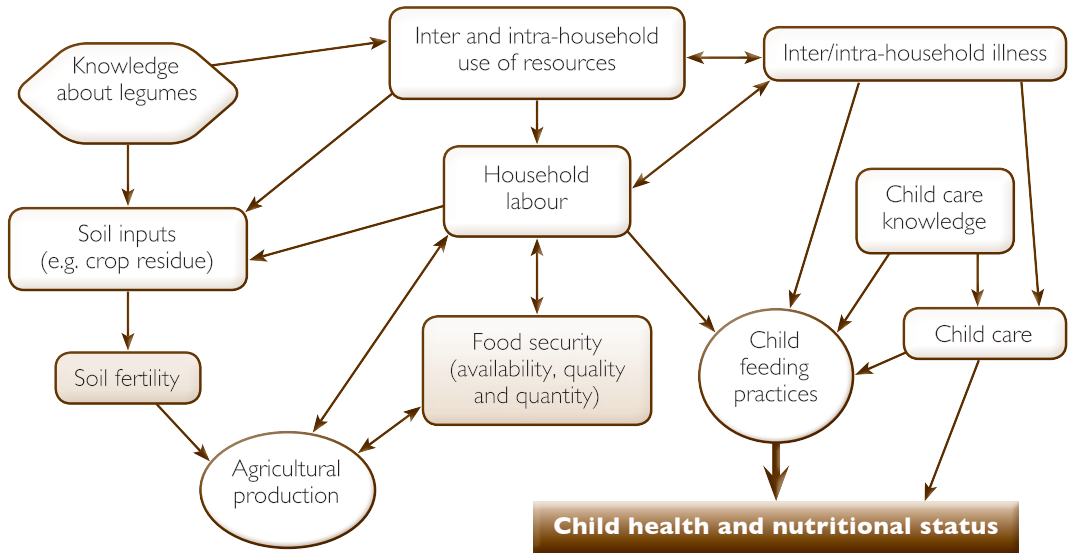
**Figure 3 Food security as a determinant of nutritional status**

its conceptual and operational coherence and can provide a rallying point for real political commitment as well as for mobilizing different sectors toward a common goal. The roles of the key sectors are highlighted below.

### Agricultural sector

Domestic availability of basic foods is a primary condition for satisfying the food requirements of the population (Figure 4). Thus, the agricultural sector plays a prominent role in achieving greater food security and, consequently, in food and nutrition surveillance systems. Food security also depends on the different types of agricultural products and farmers, their economic returns, and so on. Agricultural production policies must be differentiated according to the “type” of farmer; for example basic grain production is not always the best technological and economic option for subsistence farming. Also, production decisions at the farm level are strongly related to market conditions.

Agricultural policies concerning food production and distribution can impact strongly on the food security of vulnerable groups. The agricultural sector should assume responsibility for the surveillance of food production and domestic commercialization. These findings should be examined in relation to the degree of food insecurity of the various population groups.



Source: (5)

**Figure 4 Link between agriculture and health**

## Health sector

The health sector deals with the outcomes of socioeconomic insecurity, including food insecurity affecting large sectors of the population. Food and nutrition surveillance can therefore provide a barometer of factors that may precede health problems in the population. Surveillance can help define high-priority geographical areas and population groups in order to allocate resources appropriately. Health sector programmes that attempt to mitigate the effects of food insecurity, such as group feeding, health and nutrition education and environmental sanitation, should also be subject to monitoring as part of surveillance.

## Social and economic policy sectors

No population group can achieve food security without permanently having sufficient purchasing power to obtain an adequate basic food basket. Marketing, consumer prices, employment, wages, social protection policies and, consequently, their corresponding public policy sectors are all directly involved here.



## 2. Food and nutrition surveillance system indicators

### Introduction

Nutritional indicators are used to monitor, diagnose and evaluate nutrition and nutrition-related interventions in individuals. They are also used in populations to determine the magnitude and trends of nutritional problems under surveillance, their location and causes, and to evaluate the impact of nutritional programmes and policies. Nutritional indicators are also used in research to identify the biological and social mechanisms affecting, or being affected by, nutrition.

All of these activities include measurements of nutritional indicators; however, the choice of indicators, their measurement and analyses can be very different in research, patient management, public policy or planning and evaluating programmes. Therefore, there is no best indicator, best measure for an indicator or best analysis of an indicator in a general sense, because it depends on what is most appropriate in each situation, depending on the purpose for which the indicator is intended.

Nutritional indicators can be used to measure the nutritional determinants or consequences at the:

- individual level (e.g. patient diagnosis, screening and monitoring);
- population level (e.g. setting policy, programme evaluation, nutrition surveillance).

### Types of indicators

#### Indicators for assessing and analysing the nutritional situation

##### Nutritional status indicators

Combating or controlling malnutrition depends primarily on the information regarding the nutritional status of the population. Such information is provided by indicators of nutritional status, which characterize the nature of the malnutrition problem. They are then linked to the characteristics of individuals, times and locations, in order to obtain an indication of the distribution of the problem in the population and thus an overall picture of the situation.

When defining priorities for a nutritional situation, the following questions should be asked.

- What is the type of malnutrition (e.g. undernutrition, overnutrition, micronutrients deficiencies, severity, etc.)?
- Who suffers from malnutrition (e.g. age, sex, residency, etc.)?
- Where are these malnourished individuals (e.g. zones or administrative areas most at risk, districts, regions, etc.)?
- When is it occurring (e.g. temporary, seasonal or annual; recurring or not, chronic)?
- Nature of the problem (e.g. emergency or “normal situation”)?

First, measurement indices need to be collected at the individual level (e.g. weight, height, arm circumference, haemoglobin level, etc.). This information is then expressed at the level of the population group concerned in the form of prevalence rates (i.e. as percentages of individuals who are well nourished or malnourished, with respect to the form of malnutrition under consideration, and in accordance with chosen cut-off values). Examples might be the percentage of children aged under 5 years with a weight for age index of  $\leq 3$  Z-scores or  $\leq 2$  Z-scores; or  $> 3$  Z-scores or 2% of adults having a body mass index of  $< 18.5$  or  $< 16.0$  kg/m<sup>2</sup>.

### Indicators of causes

Once the nutritional status of the population and its geographical or socioeconomic distribution are known and goals for improvement have been set, information is needed on the determinants of the situation, i.e. on the factors, events or characteristics that are likely to affect the nutritional status of individuals within the population at different levels. It will then be possible to define a strategy to alter a number of these factors to improve the situation, as reflected in the stated objectives.

Immediate causes of malnutrition/undernutrition are:

- inadequate dietary intake
- diseases.

Underlining causes of malnutrition/undernutrition are:

- food insecurity
- environmental hygiene, access to health services.

Therefore, fundamental agro-ecological and socioeconomic indicators also need to be included in any causal analysis of a nutritional situation at national level. These are generally available from major institutions and ministries, particularly those in charge of planning.

## Indicators for monitoring and evaluating nutrition programmes

On the basis of an up-to-date evaluation of the country's nutritional situation and in view of the different causes of malnutrition identified at various levels, the role of nutritional policies is to set priorities, translate them into general goals, then into strategies and programmes, each with specific objectives and indicators.

## Characteristics of indicators (6)

To facilitate the choice of indicators, certain characteristics are used to assess their usefulness for the intended purpose. Depending on the indicator and the circumstances, these characteristics have to be given different priorities.

### Basic characteristics

Basic characteristics of indicators are as follows.

- *Validity*. A valid indicator is one that truly measures what it is meant to measure and does so as directly as possible. This is considered the most important property.
- *Reproducibility (reliability)*. This refers to the comparability of results when an indicator is measured repeatedly under standardized conditions and to its independence from the person or instrument involved. This is particularly important in monitoring.
- *Sensitivity and specificity*. Sensitivity refers to the capability of correctly identifying the cases searched for (i.e. positive answers). In turn, specificity is a measure of how well negative cases, such as individuals not affected by a condition, are identified. In other words, a specific indicator only measures actual cases. Its assessment generally needs a reference for comparison (“gold standard”).

### Operational characteristics

Operational characteristics are related to the applicability of indicators.

- *Availability*. Availability refers to the possibility of obtaining (i.e. collecting) the data necessary for an indicator. As only available data can actually be collected, this must be considered before all other operational characteristics. However, some nutritional indicators may have been gathered by other recently established nutrition programmes.

- *Dependability*. This is determined by the accuracy and representativeness of the data and the quality of data sources. As such, it expresses the trust that can be put in the data.
- *Representativeness*. This describes how well an indicator reflects the population(s) and phenomenon to be assessed.
- *Simplicity*. Simplicity is another important factor to consider for data collection as it has significant impacts on the time and effort needed and the frequency achievable.
- *Cost*. Cost may also play a role if data are not routinely and centrally collected but this is difficult to assess.

## Nutritional indicators

Traditionally, nutritional indicators have been classified as:

- biochemical
- clinical
- anthropometrical
- dietary intake.

This classification is appropriate only in relation to the human resources and facilities required to evaluate these indicators. However, it tells us little about the usefulness of indicators to meet the objectives they were supposed to serve. To find out this information, nutritional indicators should be classified according to what they tell us (e.g. nutritional problem, risk of present nutritional problem, risk of future nutritional problem, benefit from an intervention and response to that intervention).

Some objectives for the different use of nutritional indicators are listed below. Some kinds of indicators are more useful in meeting objectives than others. Although the objectives are not mutually exclusive, the indicator requirements for meeting one objective may be incompatible with meeting others.

- If the objective is to identify persons or populations to prevent malnutrition, the indicator must be a good indicator for the risk of future malnutrition. Dealing with individuals, this indicator is usually not the nutritional status of the individual, as this usually changes too late for preventive intervention.
- If the objective is to identify persons or populations who are presently malnourished so as to prevent the consequences of malnutrition, the best choice is an indicator of nutritional status. It is also important that the indicator is a good predictor in response to the intervention.

- If the objective is to identify persons or populations who are already suffering the consequences of malnutrition in order to introduce non-nutritional interventions to solve the problem, one may screen for the consequences as long as the solution is effective in overcoming the effect of the problem from nutritional and non-nutritional causes.
- For the evaluation of individual treatment, programme outcomes or research, an outcome indicator must have the potential to respond to a nutritional intervention or determinant in a way that can be identified with good statistical power. Usually this indicator refers to:
  - the risk of future malnutrition or its consequences
  - the harm caused by past malnutrition.

## Selection of nutritional indicators

The decisions for selecting indicators for a food and nutrition surveillance system depend on the nutritional situation in the country, the context of the problem and the available resources (e.g. staff, materials, money) on which the surveillance system is built. The selected indicator should be simple, measurable, accurate, reliable and time bound (i.e. SMART, see below).

Before selecting the indicators, start by assessing the factors that contribute to improving the nutritional situation and identifying those factors in need of modification and exclusion. The relevant roles of different factors should be considered. A comprehensive view of the problem, based on a broad conceptual causal framework, will guide the choice of indicators.

After the decision for selection of indicators has been made, decide:

- how to collect these indicators on a regular basis
- how to ensure that they are used effectively.

An interservice consultative group, which may or may not be institutionalized, should be established, through which these indicators or data can be reviewed and gathered.

Technical groups for data analysis and reporting are required at the various levels, to check the quality of measurements, establish the value of different indicators, compare indicators from the same level or with the same frequency of collection, estimate trends, etc.

Finally, to enhance understanding, interpretation of the data should be planned as an intersectoral task.

## Steps for selecting the indicators

Steps for selecting the indicators are as follows:

1. Develop a conceptual framework of the nutritional situation, including an analysis at the different levels (e.g. national, regional and community).
2. Identify the indicators needed for the various types of causes (e.g. immediate, underlying or basic), depending on the objectives of the surveillance.
3. Assess the basic characteristics of potential indicators (e.g. validity, reproducibility, sensitivity, etc.), bearing in mind their limitations until the time of analysis. Evaluate their operational characteristics (e.g. availability, dependability, comparability, cost).
4. Identify the data needed to build the indicators selected that are not available, and define the target group (e.g. region, community, households or individuals);
5. Select the frequency of collection depending on decision-making needs. In the case of data analysed centrally, set the frequency of recording by the services collecting the data.
6. Design a protocol for data analysis: cross-tabulation of different indicators to assess the level of risk, etc, following the causal hypotheses outlined in the conceptual framework.
7. Identify the sources of data from above (e.g. necessary data, target group and reference period, frequency of collection and analysis):
  - data immediately available: collected routinely by administrative bodies, i.e. data on management and impact of government and non-governmental programmes, systematically transmitted and analyzed at the desired level and with the required frequency;
  - data collected at decentralized levels but not transmitted: require to be recovered and analysed at the desired levels of aggregation with the required frequency;
  - data to be actively collected: specific surveys at region, community or household level, to be repeated with the required frequency.
  - data collected from primary health centres, maternal and child health centres and schools.
8. Finalize the selection of indicators on the basis of feasibility (e.g. difficulty in obtaining data; urgency; financial, technical and human resources).

The main elements that will guide selection of indicators are as follows.

- Reference conceptual framework. The use of conceptual frameworks when implementing a surveillance system is not new. Many examples have been developed, focusing on different aspects, as mentioned above.
- Required characteristics of the indicators:
  - *Validity*. Validity is the first characteristic to which attention should be paid. Quite often the ideal indicator from this point of view is not available or is difficult to collect.
  - *Reproducibility/comparability*. The ideal would be to use the same indicators in all places and at all times in order to benefit from common experience regarding collection and analysis and to enable direct comparisons.
  - *Sensitivity*. Indicators should preferably be dynamic rather than static, i.e. they should be sensitive to change and capable of recording phenomena.
  - *Operational qualities*, particularly simplicity and low cost of collection, will largely determine choice of indicators.
- Availability of baseline data.

In practice, data collected to be used as an indicator need to be compared with a recognized reference or cut-off value, such as those published by WHO.

The availability of previous repeated measurements of an indicator facilitates the identification of trends and is thus a determinant of choice between several indicators. In a number of cases, a preliminary survey is required to establish the present level of various indicators. Many countries have undertaken national surveys of their nutritional situation prior to establishing their nutrition surveillance system.

### **Criteria for selecting indicators: the SMART concept**

The desired properties of indicators will depend very much on the approach adopted and on the nature of the surveillance system:

**S**pecific

**M**easurable (and also reliable, comparable and contextually appropriate)

**A**chievable (and also cost-effective)

**R**elevant

**T**ime-bound (and also sensitive).

### *Specific*

Indicators are specific when they measure what they claim to measure and are not confounded by other factors. This is also referred to as “validity”. The problem of different meanings occurs when establishing qualitative scales of measurement. It is also an issue when designing data collection tools for indicators as even words such as “family”, “household” and “child” are culturally and contextually biased.

### *Measurable*

Indicators must be precisely defined so that their measurement is unambiguous. This generally means quantitative (e.g. percentage, ratio, number), but can also mean qualitative. They should be:

- *Reliable*. The results should be the same, regardless of who collects the data or when the measure is repeated; this criterion is also referred to as “verifiability”. For example, weight for height measures are reliable measures of nutritional status, while mid-upper arm circumference measures are more difficult to repeat reliably.
- *Comparable*. Indicators must allow comparison over time and from one location to another (essential where the indicators help to prioritize the level of need). Usually, if an indicator is reliable or verifiable, it is comparable. However, this is usually most challenging with qualitative indicators.
- *Contextually appropriate*. The measurements used must be culturally, socially and politically acceptable to the population under study, otherwise they may try to misrepresent information, under- or overreport events, or undermine true measures. For example, direct questioning about household income and assets is often considered intrusive and may yield under- or overreporting, depending on the context.

### *Achievable/feasible*

Achievability/feasibility means that the required data can actually be measured and collected. Feasibility should also be examined in terms of institutional capacity. Are the agencies, organizations and staff to be involved in data collection able and willing to do so? If indicators are part of a monitoring system, can they be integrated easily into the programme staff’s ongoing work? Examples include ease of sample selection, availability of specialized personnel or availability of transport.

Data collection should also be cost-effective in terms of capital costs, recurring costs and personnel, i.e. it should be affordable and worthwhile.



### *Relevant*

Indicators must provide information useful to the programme objectives and help guide key users' decisions. Indicators are not relevant if they are chosen without reference to decision-makers' needs.

### *Time-bound*

Indicators should describe when change is expected. An indicator needs to be collected and reported at the right time. For example, an indicator that can only tell you at the end of a project whether you succeeded in meeting certain objectives cannot influence the decision-making process.

Indicators should quickly reflect changes in the situation. They must correspond with the frequency of information required for decision-making, for example, maternal mortality measures are not sufficiently sensitive for programme decisions and so process indicators are used as proxy measures.

## **Criteria for selection: the SPICED concept**

When change is to be measured, other properties of indicators become more important and call for different criteria:

**S**ubjective

**P**articipatory

**I**nterpreted and communicable

**C**ross-checked and compared

**E**mpowering

**D**iverse and disaggregated.

### *Subjective*

Experts providing information have a special position or experience that gives them unique insights that may yield a very high return on the investigator's time. These data may thus be seen as critical because of their source value.

### *Participatory*

Indicators should be developed together with those best placed to assess them. This not only means involving the project's primary stakeholders, but may also mean involving local staff and other stakeholders.

*Interpreted and communicable*

Locally defined indicators may not mean much to other stakeholders and may often need to be explained.

*Cross-checked and compared*

The validity of assessment needs to be cross-checked by comparing the progress with different indicators and by using different informants, methods and researchers.

*Empowering*

The process of setting and assessing indicators should be empowering and should allow groups and individuals to reflect critically on their changing situation.

*Diverse and disaggregated*

There should be a deliberate effort to find different indicators from a diverse range of groups, especially men and women. The information should be recorded in such a way that any differences can be assessed over time.

## **Practical steps for identifying and selecting a set of indicators**

### **Step 1: Programme areas**

1. Make a list of programmes covered by the current surveillance system in the country.
2. Break these down into a number of programme areas.
3. Indicate whether each programme area is operational.
4. Comment on the comprehensiveness of each programme area (e.g. target population, scope and length of time that each programme has been operational).

### **Step 2: Relevant sources of data and indicators**

1. Collect copies of all relevant summary report forms currently in use.
2. Review all sources of information and relevant data collection and reporting points.
3. Identify any periodic sources, particularly those collecting community- or population-based information (e.g. household surveys, which could provide figures for the denominator of key indicators such as the number of women of reproductive age in the district).
4. Identify the indicators available from these different sources that are relevant to the surveillance system.
5. List these according to their source.

### Step 3: Review of indicators

Review each of the indicators according to the following criteria and note them:

- useful
- accessible
- ethical
- robust
- representative
- understandable.

### Step 4: Indicator selection

1. List all indicators, using one form for each programme area.
2. For each indicator note whether the criteria were met.
3. Decide whether all criteria are equally important and how many must be met before an indicator is selected.
4. It is important that the persons involved in this step feel responsible for, and competent in, the approach adopted, so that they can explain and justify it in following consultations.

### Step 5: Selection of additional, new indicators

At this stage, the group should spend some time reflecting on the list of indicators identified. The following should be considered:

1. All of these indicators are, by definition, available from existing sources.
2. It is possible that the same sources can be used to generate additional indicators that meet all the selection criteria.
3. These indicators may be preferable to those selected so far and fill gaps in the information available to planners.
4. Write down these new indicators and consider whether they meet the selection criteria mentioned in step 3.
5. Then apply the same approach and decide whether they should be selected or rejected.

### Step 6: Accuracy and time schedule of data collection

1. Having selected the indicators, the group should assess to what extent the data collection system currently in place enables these indicators to be generated accurately and reported on time.

2. This will involve cooperation with several related sections of the health administration and may lead to proposals to change the system and introduce new data and/or methods, such as the use of community-based data for selected key indicators.
3. Summarize the definition and data requirements of each selected indicator, together with the implications for the health information system.

### **Step 7: Review and identification of gaps**

1. The final step should involve an appraisal of the balance in the indicators selected, both within and across the programme areas in the country.
  - Which aspects of the nutrition problems are well covered in the indicators identified?
  - For which aspects of the nutrition problems are there insufficient indicators?
2. Determine if any imbalance in the indicators distribution is justifiable (e.g. a much larger number of indicators for a certain nutrition problem than for others).
3. Some indicators may be selected for use across more than one programme area. In this case, it would be efficient to pool the efforts involved in data collection and analysis across programme areas. This process will also highlight those programme activities for which there is currently a serious lack of indicators.
4. Consider how these gaps could be filled, perhaps by forming a small working group to study them and suggest relevant solutions.

## 3. Food and nutrition surveillance systems: implementation steps

### Introduction

The decision to establish a food and nutrition surveillance system has to be based on clearly defined objectives, taking into consideration the availability of resources, staff capacity, sustainability, environmental factors and capacity to respond to emerging nutritional and nutrition-related health problems.

Once the decision has been made to establish a surveillance system, the first step is to establish a central nutrition surveillance unit that will organize all the activities necessary to implement the surveillance system.

### Organization

#### Institutional framework

To implement sustainable surveillance system activities, a well-organized qualified structure is required. Qualified structures often already exist, although these may be incomplete or inefficient (e.g. health information system, agriculture information systems, the central bureau of statistics, the economic analysis unit, etc.). There is often also a need to introduce surveillance activity in these institutions. The solution is to have minimum institutionalization of surveillance activities by setting up a central surveillance unit, which is specifically responsible for data collection, analysis and interpretation. This unit would serve as a reference and support for other national institutions engaged in surveillance.

#### The central nutrition surveillance unit

The main function of the central surveillance unit, which can either be an individual or a small group, is to coordinate, and to provide and explain information. Existing data are continuously pooled and supplementary data collection can be organized when required. The objectives of the central unit are:

- short-term operational objectives aimed at satisfying users' needs (e.g. information requirements, training, guidance, proposing alternative strategies or intervention programmes and research);

- enhancement of the quality of information, reduction of surveillance costs, development of analysis and communication potential, and the sustainability of surveillance.

Central unit users also have other objectives related to the different fields of application of surveillance such as:

- formulation of policies or programmes, evaluation, justification, creation of awareness, consolidation of information systems;
- investigation of the causes of nutritional problems.

## Setting surveillance system activities (7,8)

Surveillance functions, resources, needs and the degree of support cover a wide range and therefore no single, universal model is applicable. Surveillance can be organized at different levels: national, regional or community. It may cover specific geographical zones or population groups. It may also focus on specific types of malnutrition, for example surveillance of disorders due to iodine or vitamin A deficiency, or on chronic noncommunicable diseases associated with nutrition, such as obesity, diabetes, hypertension, dyslipidaemia and some cancers. Consequently, this section is limited to general principles.

Four principal phases of a nutrition surveillance activity can be distinguished:

- preparatory or presurveillance
- conceptualization
- implementation
- evaluation.

### Presurveillance

When the decision to implement a surveillance system has been made, a series of preparatory activities will be necessary. These arrangements will vary depending on the specific situation, but will generally include the following:

- answering questions such as: Who is making the decision to set up nutrition surveillance? Why? What is expected of surveillance? What do we already know?
- identifying the levels of surveillance (national, regional or local);
- preliminary identification of potential users and their probable needs;
- general identification of types and modes of information that are likely to be required;

- identification of “stakeholders” as well as selection and definition of the responsibilities of “nutritional coordinators”;
- preliminary decisions on the opportunity to conduct a baseline survey;
- general planning of the surveillance activity.

### **At what level will surveillance be established: national, regional or community? Which groups will be covered? Is it for certain problems?**

From a practical point of view, once the levels of utilization have been determined, two simple questions should be asked: “Who wants to know what?” and “For what purpose?”. The preliminary response to these questions increases the relevance of the information provided and thus the probability that the data will be used. Furthermore, the preliminary response reduces the operational cost, which enhances the efficiency of data collection. Finally, this exercise should also provide some idea of the sustainability of the surveillance activities.

### **Who are the potential users of the information? What are their expectations?**

The list of surveillance initiators does not necessarily include all future end-users and potential users may also be found in other, not yet identified, categories. At this stage, it is only a matter of identifying expected users.

### **What types of information will most probably be required? What are the main trends? In which areas? Comparing groups or regions? For which possible decisions?**

At this stage, only very rough ideas need to be written down. More detailed information will be provided during later steps.

### **What types of stakeholders will be involved?**

Four types of players can be identified:

- the surveillance coordinator (whether an individual or a group, it is important to define the exact responsibilities of the coordinator at an early stage);
- the information users;
- the data providers;
- the supporters (who are usually also the financiers of the surveillance system).

Define the role of each category of player in each of the phases (i.e. presurveillance; construction of the conceptual model; choice of required information; data selection,

collection, analysis and interpretation). Several stakeholders may be involved in each of these phases.

Another important parameter that should be considered before starting the surveillance activity is the different levels and forms of staff training.

### Is it necessary to establish a baseline reference?

It is preferable to conduct baseline surveys after identifying different roles, defining principal objectives and selecting preliminary indicators. This first phase of surveillance is generally concluded with collaborative decisions and the elaboration of the preliminary plan for the implementation of surveillance, which particularly refers to the planning of the conceptualization design phase. The duration, extent of validation and order of events do not follow any strict, preset rule, other than that of flexibility.

## Conceptualization (7)

Conceptualization is a participatory process in the form of a workshop, in which all potential future stakeholders in the surveillance activity participate on an equal basis.

The following steps should be followed in the conceptualization phase.

1. *Construction of a causal model of the nutritional problem.* Using the definition of surveillance and the causal model as a reference will ensure the relevance of the answers obtained. Similarly, the model designed in the presurveillance phase should be used to obtain a nutritional diagnosis.
2. *Precise identification of future users of the surveillance,* their information requirements and the predicted fields of application of surveillance.
3. *The choice of data to collect and the definition of indicators using the causal model.* This type of data selection should simultaneously consider user requirements, cost, feasibility and the likelihood of obtaining data in a sustainable manner. Above all, the prospective and retrospective data that will be required should be identified using a highly selective process.
4. *The determination of modalities for data analysis.* This should be based on standardized methodologies, stable in time (e.g. raw data analysis, analysis of trends, validation of certain hypothesis from the initial model, etc.). In addition, the flow of data and information should be taken into account (e.g. to whom, via which routes, at what frequency?).
5. *The detailed planning of the nutrition surveillance activity and operations* itself should provide answers to a series of standard questions: Who? What? Where? When? How? With whom? The activity planning requires appropriate tools and different



methods for each country or even for each sector, including calendar, budget and action plans.

6. *Conceptualization of an evaluation strategy for nutrition surveillance.* Despite the fact that such assessments only take place after programme implementation, they should be clearly planned during the preliminary phase of conceptualization.
7. *An analysis of conceptual consistency.* This final step involves ensuring that the surveillance decisions are clear, that the relevance of information is guaranteed and that all precautions have been taken to ensure sustainability. In other words, what is needed is a final complete check prior to the initiation of any surveillance activity.

it is important to consider how the information from the surveillance system will link to action or response. Information is meaningless unless it is used appropriately.

## Implementation (8)

The following steps are recommended to implement the surveillance system.

1. Review the existing system.
2. Define the data needs of relevant units within the health system.
3. Determine the most appropriate and effective data flow.
4. Design the data collection and reporting tools.
5. Develop the procedures and mechanisms for data processing.
6. Develop and implement a training programme for data providers and data users.
7. Pretest and, if necessary, redesign the system for data collection, data flow, data processing and data utilization.
8. Monitor the developing steps/implementation.
9. Develop effective data dissemination and feedback mechanisms.
10. Enhance the surveillance system.

## Reviewing the existing system

### *Principle*

Review the existing sources of nutrition information (i.e. indicators collected, frequency of collection, target population) to prevent duplication and ensure appropriate linkage or integration with the relevant existing information systems. Do not destroy existing systems but build on their strengths and learn from their weaknesses.

*Steps*

1. Make a list of the forms, log books and other tools used to record and summarize data at different levels.
2. Assess the quality of the data being collected using the existing forms at different levels. Among the aspects to be included in the assessment are:
  - accuracy
  - completeness
  - adequacy
  - timeliness.
3. Determine the problems encountered with the current system of data collection at different levels, including the timing and flow of information.
4. Determine the current status of the other components of the surveillance system such as:
  - data processing, analysis and dissemination;
  - supply and logistics;
  - staff development;
  - coordination, cooperation and communication within and between different units in the Ministry of Health, as well as with related agencies outside of the Ministry.
5. Identify any aspects of the system that need to be modified or stopped.
6. Summarize the results of the assessment in a formal report.
7. Discuss the results of the assessment with the proper authorities.

*Challenges / risks*

The following challenges should be addressed:

- identification of the authorities to make the assessment;
- availability of technical expertise and resources to do the assessment;
- cooperation among the different units in the assessment process and involvement of end-users at all levels;
- formation of a body, ideally an interdepartmental committee, to plan, monitor and manage all phases of development of the surveillance system, from baseline assessment to evaluation.

## Defining data needs

### *Principle*

Define a minimum set of core indicators that both refer to nutritional status and also provide an understanding of the underlying causes of malnutrition. Different administrative levels in the health system have different roles and therefore have different data needs. Not all data needs should be generated through the routine system of data collection. Data that are not frequently required, or are required only for certain subsets of the population, can be generated through special studies and sample surveys.

### *Steps*

1. Define the different roles/functions of each level, for each of the major programmes. The following programmes are highly recommended for establishing the surveillance system:
  - a maternal and child health programme for infants and mothers;
  - an Integrated Management of Child Health programme for children less than 5 years old;
  - a school health programme for schoolchildren;
  - a community-based health programme;
  - emergency/relief specific operation.

The data will be collected at different levels (community, health facility, district, regional and national, Table 4).

<b>Level</b>	<b>Description</b>
Community	Represented by basic nutrition educators, mayor/leader of the village, health workers or similar care providers at village level
Health facility	Defined by each country. For surveillance purposes, the health facility may include institutions with outpatient and inpatient facilities
District, regional or provincial	Intermediate administrative units. Countries may have two intermediate levels (e.g. district and provincial)
National	In many countries this is the federal level where policies are set and resources are allocated. This level usually compiles information and gives data to several programmes
Regional	At this level, surveillance data are reported to WHO or other agencies

Source: (8)

2. Identify the indicators needed by each level to perform its functions. Note that some levels, especially at higher administrative levels, need data coming from other ministries or departments related to the health and nutrition sector.
3. Develop calculation formula and identify the variables or data elements needed in order to compute the indicators.
4. Determine the sources of the different data elements needed for both the numerator and denominator of each indicator. The major sources can be:
  - routine data generated from the nutrition and health management information system of the Ministry of Health;
  - special studies and surveys conducted by the Ministry of Health;
  - nutrition-related information systems under the responsibility of other agencies or institutions (e.g. the vital registration system, usually under the Department of Justice or the National Statistics Office, and the nutrition data collected by the Ministry or Department of Agriculture, etc.).

#### *Challenges/risks*

The following challenges should be addressed:

- roles and functions of different units with respect to data generation and utilization are not well defined;
- defining minimum basic data needs;
- differentiating data that should be included in the routine data collection system, from data that are best generated through special studies and sample surveys;
- inability of staff at different levels to identify data needs while their understanding of indicators is often lacking.

## **Determining the data flow**

### *Principle*

Not all the data collected at a certain level needs to be submitted to higher levels. The most detailed data should be kept at the source and reporting requirements to higher levels should be kept to a minimum.

### *Steps*

1. Determine what data will be submitted to whom. This involves the:
  - identification of variables/indicators that need to be submitted to higher levels;
  - identification of most appropriate units and position of persons to whom summaries will be submitted.

A major determining factor for this step is the function of the office and/or the person to whom the data are submitted in relation to the generation and utilization of information.

2. Determine how frequently data should be submitted to each level, considering the following factors:
  - needs of each level;
  - how a common phenomenon is observed – reports on infrequent events or ones that are not often needed (e.g. the number of immunization campaigns conducted in a village) can be submitted on a quarterly or on a semi-annual basis, instead of monthly.
3. Determine in what form data will be submitted to each level:
  - raw data versus summaries
  - hard copies versus electronic files.
4. Make a flow chart that shows the flow of information from the peripheral to the highest level.

#### *Challenges / risks*

The following challenges should be addressed:

- lack of understanding concerning the purpose of the data collection;
- inability to distinguish between data needed for service delivery and data essential for programme management and monitoring;
- inability of lower administrative levels to generate summaries of raw data collected due to:
  - lack of technical expertise of staff (including computer skills)
  - lack of data processing facilities (e.g. calculators, computers, etc.)
- lack of storage facilities for raw data at lower administrative levels;
- data retrieval issues, inability to generate any information (e.g. owing to computer breakdown).

## **Designing the data collection and reporting tools**

### *Principle*

When designing forms, the ability of the staff to fill them in must be considered. Think about contextual issues when interpreting the data, such as seasonality, population movement, morbidity patterns and historical trends in nutritional status. The most effective data collection and reporting tools are simple and short.

*Steps*

1. Develop the first draft of each required form, using as a guide the list of indicators to be used for the programme. This step entails either the modification of existing forms or the development of new ones.
2. Compare the first draft with the list of indicators to ensure that all data needs can be generated from the form.
3. Present the first draft of the form to relevant staff members and discuss the following aspects of the new form.
  - How does it compare with the old forms?
  - What are the advantages and disadvantages of the new form?
  - What modifications are needed to enhance the new form's advantages and minimize its disadvantages?
  - For countries that have a number of dialects, is it necessary to translate the forms into the major dialects used in the different regions of the country?
4. Prepare a draft of an instruction manual on how to fill in the new forms.
5. Pretest the use of the new forms as well as the instruction manual.
6. Assess the results of the pretest.
7. Modify the forms and the instruction manual, based on the results of the pretest.

*Challenges/risks*

The following challenges should be addressed:

- technical expertise/capability of data providers is not consistent with the level of complexity needed for data collection tools to meet the data expectations of users;
- designing the pretesting activity and ensuring the comparability of conditions with actual implementation: Where? Who will be involved? For how long?

## Developing procedures for data processing

*Principle*

The way the surveillance system data are processed should be consistent with the objectives for data collection and the plans for analysis and utilization.

*Steps*

1. Assess the advantages and disadvantages of manually processing data compared with using computers by considering the following factors:

- cost;
  - availability of personnel with the proper level of technical expertise to run a computerized system; in particular, the software skills of the staff at the lowest computer-provision level should be checked;
  - availability of technical support in case of hardware breakdown.
2. If a computerized system is to be implemented, decide on the lowest level where computers will be used to process data. One of the most important considerations in choosing this level is the presence of staff trained in system maintenance.
  3. Define the specifications for software development, in consultation with different levels of data users. Among the important aspects to be decided are:
    - summary reports to be routinely generated
    - data quality control mechanisms/checks to be incorporated in the software
    - data analysis requirements of the data users.
  4. Develop the software needed to process the data at each level where computers will be used, based on the required specifications. It may also be possible that software designed to generate outputs similar to those of the surveillance system has already been developed and requires only minor modifications to customize it. In this situation, resources to acquire and customize the software should be determined. A final decision needs to be made on whether to develop new software or acquire and modify an existing programme.
  5. Pretest the software, paying attention to:
    - identification of viruses
    - ability of software to generate the expected data
    - ability of staff to use it.
  6. Develop and pretest the user's manual for the software.
  7. Design a training programme to train relevant staff on the use of the software.

#### *Challenges / risks*

The following challenges should be addressed:

- capability of existing hardware to incorporate the software as well as its ability to store all the data (especially at the lower levels);
- compatibility of the developed software with the existing software (future interaction);
- basic system maintenance procedures;
- the security system.

## Developing the training programme

### *Principle*

The training programme should be designed according to the needs and level of the target groups.

### *Steps*

1. Conduct a training needs assessment for data providers and data users. Four types of trainings are usually conducted. These are:
  - training of trainers
  - training of data providers at the peripheral levels on how to fill out forms
  - training of computer operators on the use of the software and hardware
  - training of staff at different levels on data utilization.

A separate training needs assessment should be conducted for each type of training. Among the variables to be collected for the training needs assessment are the following:

- basic function of each staff member
  - extent of previous training received
  - when training was received
  - adequacy of previous training to enable staff to perform expected functions
  - desired training areas.
2. Develop the curriculum/agenda for each type of training, based on the results of the training needs assessment. The following aspects should be covered:
    - target group (for whom?)
    - content (what?)
    - strategies (how?)
    - duration (how long?) – this refers to the total duration of the training programme, as well as the time allocated for each topic included in the training; the output of this step is a course syllabus/curriculum for each training programme to be conducted.
  3. Develop the training materials (Table 5). The participants of the training of trainers course should be provided with:
    - a copy of the data dictionary manual for data providers
    - the manual for data users.
  4. Generate the training materials. Since there is a chance that some modifications in the format, structure and content of the training materials will be made based on the evaluation results, the number of copies at this stage should be limited.



**Table 5 Suggested training materials**

Type of training	Training material	Contents
Training for data providers	Data dictionary manual for data providers (separate manual for each level)	List of indicators, formulas, definitions, data sources Instructions on how to fill in the forms
Training for data users	Manual for data users (separate manual for each level)	Data analysis, interpretation and utilization
Training for computer operators	Computer software user's manual	Detailed instructions (with examples) on how to use the software; troubleshooting
Training of trainers	Trainer's manual	Instructions on how to implement the training programme for data providers and data users; teaching strategies; guidelines on the use of the manual for data users and manual for data providers

Source: (8)

5. Design the evaluation strategy for the training programme. It is important to determine the methods prior to the training activities, since most evaluation designs require the collection of a baseline or pretraining level of knowledge among the participants.
6. Identify the most appropriate participants for each type of training, based on their duties and responsibilities related to data generation, management and utilization. An efficient strategy is to identify and train exclusive staff who can act as trainers for the neighbouring areas. If this strategy is adopted, it is important to consider the geographic distribution of participants of the training of trainers course.
7. Conduct the training of data providers.
8. Conduct the training of data users. This is usually conducted after sufficient data from the surveillance system has been collected to use as examples during the training.
9. Evaluate the training programme, including the training materials used.
10. Modify the training materials and the training programme based on the results of the evaluation. This should be done prior to another series of training activities.

#### *Challenges / risks*

The following challenges should be addressed:

- selection of appropriate participants for the different training programmes;
- backgrounds of staff identified to enter data and generate reports using the software developed for the surveillance system (e.g. are they very different?);

- language/dialect to be used for the training materials;
- extent of dissemination of training materials and manuals;
- preparation of adequate facilities to conduct training.

## Pretesting the system

### *Principle*

The system should be pretested in conditions that as much as possible reflect the conditions prevailing during its implementation.

### *Steps*

1. Prepare the guidelines for pretesting the system, addressing the following questions.
  - *Where?* Selection of the place(s) where the pretesting will be conducted. There is a need to develop criteria for selecting the pretesting sites. These can include technical factors like the level of expertise or qualifications of the staff in the area, practical considerations like the proximity of the area, the availability of infrastructure support or the level of cooperation of the staff.
  - *Who?* Who will participate in the pretesting? How many people? It is important to include the different types of data providers and data users in the pretesting.
  - *What?* What are the specific objectives of the pretesting? Specifically, what aspects of the surveillance system will be pretested? What are the different activities to be undertaken to achieve these objectives?
  - *How?* What modes and tools for data collection will be utilized to systematically collect the data required for an efficient pretesting of the forms?
  - *How long?* For how long will the pretesting be conducted?
2. Instruct the staff involved in the pretesting:
  - inform them of the objectives of and procedures for the pretesting;
  - train the data users and data providers on the different pretest areas on the new system.
3. Implement the pretesting activities.
4. Write a report on the results of the pretesting.
5. Formulate recommendations based on the results of the pretesting and correct the surveillance system according to the recommendations.

### *Challenges / risks*

The following challenges should be addressed:

- implementing a systematic and proactive monitoring mechanism during the pretesting phase;
- systematic updating of the software in all units where it has been installed;
- ensuring that all elements and staff are ready for the pretesting phase.

## **Monitoring the developing steps/implementation**

### *Principle*

The goal of monitoring and evaluation is not to focus on what is wrong and to condemn it but rather to highlight the positive aspects of the system as well as to identify improvement opportunities. Establish triggers to determine when more detailed nutrition assessments are necessary.

### *Steps*

1. Develop a plan for the systematic monitoring and evaluation of the system.
  - What will be monitored and evaluated?
  - How will it be done?
  - Who will do it?
  - How frequently will it be conducted?
  - How will the results be systematically disseminated?
  - How will actions resulting from the evaluation results be generated?
2. Identify the resources needed to implement the monitoring and evaluation plan.
3. Prioritize the activities, based on availability of resources and need.
4. Implement the monitoring and evaluation plan.
5. Document and disseminate the results of monitoring and evaluation activities.
6. Make recommendations based on the results of monitoring and evaluation activities.

### *Challenges / risks*

The following challenges should be addressed:

- institutionalizing monitoring and evaluation to ensure that it becomes a regular activity and will be allocated the corresponding resources;
- ensuring availability of technical expertise and other resources for monitoring and evaluation.

## Developing data dissemination and feedback mechanisms

### *Principle*

Constant feedback, positive and negative, on the status of the produced data is essential for the motivation of data producers and for a valuable, high-quality data outcome.

### *Steps*

1. Determine the most effective and efficient way of disseminating the data generated from the surveillance system by considering the following factors.
  - *Who* is the target for dissemination? The needs of target groups have to be considered.
  - *What* should be disseminated? This should include not only the outputs of the surveillance system but also feedback of users and the way they are using it.
  - *How often* should data be disseminated to the different target groups?
  - *In what form* should the data be disseminated to each of the different target groups? The whole range of forms and venues for data dissemination should be considered.
2. Identify the human, financial and all other resources needed to implement the data dissemination plan.
3. Prioritize the different modes of data dissemination to be adopted, based on the necessity and availability of resources.
4. Implement the data dissemination activities.
5. Develop and implement a system for monitoring and evaluating the data dissemination and feedback activities conducted. Among the factors to be considered are:
  - coverage, (to what extent is the material reaching the target audience?)
  - effect of the feedback system on the staff
  - degree of utilization by the target audience (are they actually using the data presented in the different materials?)

### *Challenges / risks*

The following challenges should be addressed:

- preparing a management report;
- limited financial resources for dissemination;
- ensuring that dissemination activities reach the target group;

- consistency between the data disseminated by the surveillance system and similar data published by other units within the Ministry, especially those of vertical programmes such as the Expanded Programme on Immunization and Integrated Management of Child Health.

## Enhancing the surveillance systems

### *Principle*

The development of a surveillance system is always a work in progress. It is a dynamic process, where managers and workers struggle for constant improvement.

### *Steps*

1. Review the results of monitoring and evaluation activities conducted on the surveillance system in recent years and include the necessary changes for improvement identified in the previous phases.
2. Identify aspects of the surveillance system that need to be developed further to facilitate its functioning. The basic question to be answered is: What aspects should be emphasized next? Among the possible aspects that need further investigation may be:
  - enhancing and institutionalizing procedures to assure data quality control;
  - developing capacity to conduct special studies and sample surveys;
  - defining coordination mechanisms for the horizontal use of data generated from vertical programmes;
  - developing strategies to keep the staff interested at different levels in using the data for programme planning, management and evaluation;
  - establishing intersectoral and intrasectoral linkages among units involved in different aspects of the system;
  - unifying and coordinating initiatives of sectors and funding agencies related to the system.
3. Identify resources needed to implement the different options for the enhancement of the surveillance system. This should include:
  - specific types of resources for each planned expansion activity;
  - the budgetary requirements (if any);
  - the desired source of support for each type of resource needed.
4. Prioritize the different options according to degree and urgency of need, and availability of resources for its proper implementation.

5. Prepare a timetable for the implementation of the different activities for the expansion of the system.
6. Conduct the different activities needed to implement the desired enhancement of the system.
7. Monitor and evaluate the effect of newly implemented aspects of the system.

#### *Challenges / risks*

The following challenges should be addressed:

- sustaining interest among different stakeholders for the continuous development of the surveillance system;
- generating resources to support the different activities for system enhancement;
- coordinating the activities of the different agencies in order to minimize the production of data collection forms and the duplication of efforts in areas related to development of the system;
- ensuring the continued existence of a body or committee to control the surveillance system after the pilot-testing phase.

## **How to strengthen a surveillance system (9)**

This section highlights how a functioning effective surveillance system assists nutrition and nutrition-related programme managers, workers and other stakeholders throughout the health system to make better decisions and take timely action.

Nutrition surveillance is not just to collect data, but to interpret the data and communicate information so that it can be used for decision-making. A surveillance system is an action-based system that consists of set of activities that allow you to collect, analyse and interpret data and to communicate your findings and conclusions so that appropriate actions can be taken.

Before discussing steps to strengthen a surveillance system, it is important to know the characteristics of a good system.

### **Characteristics of a good nutrition surveillance system**

The following are characteristic of a good surveillance system:

- *Capacity to act on information.* First and foremost, the system must be able to act on information produced, whether in terms of a well-organized response to the rising nutrition problem or of managers using the information to make better medium- and long-term decisions.

- *Standard case definitions and reporting protocols.* These allow correct and timely documentation and reporting.
- *Basic and sound investigation methods.* Appropriate analysis and interpretation techniques should be used.
- *Adequate laboratory support.* Appropriate actions require accurate detection. Cases detected in the field may require more sophisticated labs for confirmation of the diagnosis.
- *Efficient communication systems.* Information and feedback must pass quickly.
- *Cost-effective resource use.* The system must focus on priorities to keep nutritional problems under control and on cooperation where appropriate to save duplication of efforts.
- *A network of interested people.* The system is only as good as the people who operate it.

## **Principles for transforming a weak or non-functioning surveillance system into a stronger one**

The following principles can transform a weak system into a stronger one:

- make appropriate systemic improvements and include the aspects of improvement identified in the evaluation phase;
- build ownership for all improvements at every level;
- train personnel in order to develop skilled workers;
- ensure availability of resources.

Transformation by definition means change. If no change is made, the surveillance system will continue to function poorly, with the associated nutrition and health risks and detrimental effect on the economy. The transformation or improvement has to be sustainable. There are many factors influencing the sustainability of a system, including local capability and resource availability. To enable sustainability of an improved system, capacity, motivation and resources are essential. If transformations are made but not sustained, improvements will be lost and the system will either revert to its prior state or perhaps get worse or even collapse. Therefore, the focus should be on building ownership through empowerment in order to sustain the improvements.

National ownership motivates stakeholders to maintain improvements over time. Ownership should:

- result when people know and care enough about their surveillance system to fund interventions to implement improvements;
- be built at each level of the system: national, regional and local;

- be built by all parties: data recorders, data analysers and decision-makers.

Building ownership should be ongoing, helping to increase commitment and strengthen capacity to improve the surveillance system at each step of the process.

## **Practical steps to transform a weak surveillance system into a stronger one**

1. *Assess the current nutrition surveillance activities.* The first step is to look at the current nutrition surveillance activities and how they are being performed.
2. *Determine specific conditions.* In what context is the surveillance system working?
3. *Identify strengths, interactions, opportunities, weaknesses and gaps.* Is there an overlap with other interventions or activities? What are the challenges?
4. *Develop a plan of action.* Set out the priorities, strategies and time schedule for the implementation of various action steps to transform the system into a better one.
5. *Implement the plan of action.* The best plan of action needs monitoring over time.

### **Assessing the current surveillance activities**

Assessing the current surveillance activities includes asking several questions about the system and its performance (i.e. what exists and how well it is used).

- Are there guidelines for identification of nutrition problems?
- Are there protocols for actions?
- What are the norms and expectations for communication?

Improving surveillance means examining the whole system and its components. The following key partners should be involved in the assessment:

- Ministry of Health (nutrition surveillance and action personnel) – those who collect data and those who respond to trends identified through the nutrition surveillance;
- managers of vertical programmes, such as the Expanded Programme on Immunization, Integrated Management of Child Health, Stop TB Strategy;
- staff of laboratories involved in the nutrients and nutrition problems analysis;
- special project personnel, such as sentinel surveillance or limited geographic surveillance;
- nutrition-related sectors, government, academia, nongovernmental organizations, etc.



## Determining specific conditions

The next step after collecting the required information is the analysis and interpretation of the data.

## Identifying strengths, interactions, opportunities, weaknesses and gaps

Where are the gaps in performance? Listening to feedback from partners and involving them in the process of interpretation helps to identify problems and find solutions.

In the analysis and interpretation of the nutrition information the main focus should be on the following.

- *What works well and what does not?* Identify successful actions/measures to build the plan of action on existing capacity and strength. Communication with people who work in the system will provide this information.
- *What types of activities can be built on? Where can collaborations be found?* Are there common elements among the surveillance system activities that can be consolidated (e.g. standard setting, training, supervision, communications or resource management)? Are there opportunities to share resources such as personnel, equipment (e.g. computers) or transport?
- *What are the gaps in the system?* Is there capacity to act?
- *What support is available?* Is there an effective communication system? Are resources being used well? Are people being trained to operate the system?

After reviewing the current surveillance system and identifying opportunities to build on and to strengthen existing measures, a plan of action has to be developed. The building of ownership necessitates empowering key personnel to incorporate the existing, successful components and the information from the assessment into a new plan of action.

## Developing a plan of action

Developing a plan of action is just the beginning. For improvements in the surveillance to be effective, they must be implemented and sustained. Sustainable improvements require the commitment to build ownership of the system.

Essential components of the plan of action include the following.

- *Building on existing strengths* and focusing on strengthening essential core and support activities.
- *Considering short-term and long-term needs.* A surveillance system is not just a quick response to an emerging nutritional problem, it is also important for the medium-term and long-term goals of identifying nutritional status as well as identifying risk trends and modifying programmes and policies.

- *Setting priorities and realistic goals.* It is not possible to do everything, and trying to do so weakens performance. Instead, focus on major health concerns such as:
  - concerns of public health importance such as morbidity, mortality, WHO policy (e.g. eradication, elimination);
  - concerns with established actions (e.g. vaccination, prevention measures, education campaigns);
  - concerns where laboratory, health facility, environmental or other relevant data are available;
  - concerns for which the surveillance system and actions are worth the effort.

## Implementing the plan of action

To encourage support and commitment for improving the surveillance system the following actions are important.

1. *Communicate the plan of action.* Meet partners and participants in the assessment phase and share the draft of the plan of action with them for feedback. Also use this opportunity to share the draft with other key players to whom you may not yet have talked.
2. *Encourage interaction of stakeholders in the plan of action.* Consider this a draft plan of action and let key stakeholders have the time and opportunity to make comments and suggestions. Accommodate their suggestions where feasible or explain why their suggestions cannot be included.
3. *Secure commitments of leadership, resources, and action.* Be specific about who is responsible for each part of the plan of action, who is funding each action and in what timeframe the implementation will proceed.
4. *Establish partnerships* and plan future action together.
5. *Establish monitoring* to measure and control the implementation phase.
6. *Implement the plan.*
7. *Monitor progress and results.* Collect data to find out if the implementation is proceeding as planned and if the “improvements” are making any difference.
8. *Adapt as needed.* Use the monitoring information to provide feedback to users and stakeholders of the system and make changes and modifications if required.

Getting the right team is very important for ensuring the technical appropriateness of the results and the feasibility and sustainability of the recommendations.

Two types of teams will be involved: an assessment team, which collects and analyses the data, and an oversight team, which provides guidance to the assessment team. Assessment team members should:

- be knowledgeable (i.e. can determine what data are needed)
- be respected (i.e. others will hear what they have to say)
- be objective (i.e. not biased by fixed ideas).

Oversight team members should:

- have seniority and decision-making authority
- be respected and influential leaders (i.e. others listen to them)
- be representative of the important stakeholders in the surveillance system.

To build ownership of the assessment, local officials should:

- understand the benefits of an improved surveillance system and take part in the assessment;
- be encouraged to be open (i.e. give accurate information about the strengths and weakness of the current system to allow the assessment team to make appropriate, effective recommendations).

To build ownership of surveillance improvements, respondents should:

- welcome changes to the system and be committed to implementing improvements;
- feel empowered that their comments and suggestions will be noted and considered.

In the final stage of data analysis and the development of recommendations, there are additional ways of building ownership for an improved surveillance system. Respondents need to feel that their input is recognized as a valuable and worthwhile contribution to the improvement process, therefore:

- look for worthy ideas provided by respondents during the assessment, incorporate these into the analysis and recommendations, and acknowledge their source;
- identify opportunities for improving the system and, in order to continue building ownership of improvements, pick the most suitable strategies and recommendations that will show visible improvements;
- start with small successes in areas where there is support for the improvement and avoid debated recommendations at the onset of change.

Initially, it is important to focus on a limited number of priorities, instead of trying to tackle every problem and weakness at once. Prioritizing allows the team to concentrate its efforts and makes it easier to increase the likelihood of early success, which can be used to mobilize further support. Without priorities, the team risks either taking no action because the project seems too overwhelming and costly,

or taking action that wastes effort because it is not the most important. To ensure success, the priorities should represent a consensus of stakeholders' concerns.

Over time the surveillance system should begin to change as implementation progresses. To maintain this change there is a need to maintain a base of support by checking the following:

- *Are the right people involved?* As implementation occurs, are key stakeholders still working towards implementation? Have new stakeholders gained importance in the process? Who are they? Are they being involved?
- *Is the team communicating with supporters?* Do they know the status of the surveillance system improvements and the successes and weaknesses? Sustaining ownership depends on effective communication with supporters.
- *If improvements are not working as planned, what can be done?* Involve supporters in modifying the approach to change. Use supporters to advocate for change.
- *What happens to actions that were not selected as priorities?* Many are important and still need to be addressed. Some partners may support issues that were not priorities. Ask for their assistance in implementing these recommendations.

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*Food and nutrition surveillance systems: Technical guide for the development of a food and nutrition surveillance system* provides guiding principles and technical background for policy-makers, technical staff and trainers. It explains in detail the concept and principles of surveillance methodology, implementation process, and data collection, analysis and reporting.