

11 May 2016
10-5-90

INTERNATIONAL NUTRITION UNIT
(INU)

TECHNICAL REPORT SERIES



OFFICE OF INTERNATIONAL HEALTH
PUBLIC HEALTH SERVICE
U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
ROCKVILLE, MARYLAND 20852

PN-700

Guidelines for the Design and
Organization of Health Sector
Nutritional Status Surveillance

Final Draft
May 22, 1985

Virginia S. Yee

*Funding was provided by the Office of Nutrition, Bureau for Science and Technology, U.S. Agency for International Development, through an arrangement with the Office of International Health, Department of Health and Human Services, and with LTS Corporation.

ACKNOWLEDGEMENTS

I wish to thank the following people who kindly reviewed earlier drafts of this document and provided comments which were very useful in revising those drafts: Dr. Charles Teller, Dr. Jose Mora, Dr. Jean-Pierre Habicht, Dr. John McKigney, Ms. Marcia Griffiths, Mr. David Eckerson, Ms. Mary Ann Anderson, Dr. Nancy Pielemeier, Dr. William Drake, Dr. Harold Rice and Dr. Joe Wray. My appreciation also goes to Ms. Delores Burton who typed the first draft and to Ms. Arlene Richardson who worked on subsequent versions of this document.

Any comments or criticisms of this document are welcomed. The author is particularly interested in suggestions on how this document can be simplified to improve its usefulness. Please send your suggestions to:
Virginia Yee, LTS-International Nutrition
Division, 121 Congressional Lane, #304,
Rockville, MD. 20852, U.S.A.

EXECUTIVE SUMMARY

This document is intended as a reference for health officers who are not familiar with the existing literature on growth monitoring and nutritional surveillance but are involved in the design and organization of health sector nutritional surveillance activities and training of health workers in nutritional surveillance. The materials presented are drawn from the works done on this subject by the American Publication Association, the Institute of Child Health, Community Systems Foundation and the Cornell Nutritional Surveillance Program. The main difference between this document and those developed by the institutions mentioned is that these guidelines attempt to integrate growth monitoring with the concept of nutritional surveillance, as it is presented by the Cornell group. Otherwise, every attempt has been made to reinforce the ideas promoted by these institutions.

The main purpose of nutritional surveillance is to provide information to support decisions that affect nutritional status of a population. Data on nutritional status are needed for the planning of nutrition programs, and the monitoring, management and evaluation of programs aimed at improving nutritional status. In the health sector nutritional status is considered to be a central indicator for monitoring progress towards health for all by the year 2000.

Data for nutritional surveillance must be collected continuously and regularly and used to support decisions that lead to action, otherwise there is no sense in collecting data. Wherever possible, the community and health workers in the field should be encouraged and allowed to participate in decision making. Therefore methods developed for nutritional surveillance should be as simple as possible to facilitate community participation.

Nutritional surveillance must serve a clear purpose therefore it is essential to have a clear definition of the purpose before embarking on nutritional surveillance. Who will use the data to make what decisions? What kind of data are needed by each decision maker? Where will data come from? How will data be gathered, analyzed, disseminated and used? All these questions must be answered in advance in the initial assessment phase. A framework for doing an initial assessment, to determine if nutritional surveillance is needed and feasible, is provided in Chapter III. If nutritional surveillance is found to be needed and is feasible, then the information gleaned from the initial assessment can be used to develop an appropriate nutritional surveillance system.

Wherever possible, existing data sources should be built upon. Growth monitoring is an example of a source of data that can serve as a basis for nutritional surveillance. How this may be organized to provide data for nutritional surveillance is discussed in Chapter IV. Sample forms are provided for the registration of households, recording nutritional status, and some summarizing the individual data to obtain a community profile are included. These forms should be adapted to suit the local conditions where this manual is being used. A brief discussion is also included on an alternative data source: sample surveys.

In addition to have a clear definition of the purpose of nutritional surveillance, there must also be adequate staff, funds and other physical resources to carry out the necessary activities. Staff must be adequately trained to collect, and use the data.

CONTENTS

- (i) Acknowledgements
- (ii) Executive Summary
- I Introduction
- II Definition and Principles of Nutritional Surveillance
- III Guide for Establishing Need for Nutritional Surveillance and its Feasibility
- IV Data Gathering for Nutritional Surveillance
- V Organization and Management
- References
- Appendix A
- Appendix B

CHAPTER I

INTRODUCTION

The promotion of an adequate food supply and proper nutrition is one of the eight basic elements of the Primary Health Care strategy,[1] as defined by the World Health Organization. Nutritional status of children is considered to be a central indicator for monitoring progress towards health-for-all at program, national and global levels[2]. In principle, most countries have accepted the concept of Primary Health Care and many countries are attempting to include nutrition activities in their Primary Health Care strategies. The activities included vary,[3] but generally the main activities are:

- o growth monitoring,
- o food supplementation for malnourished children and women and children considered to be at-risk of malnutrition,
- o micronutrient supplementation,
- o treatment and rehabilitation of severely malnourished children,
- o actions to improve food availability,
- o nutrition education.

Nutrition education is usually directed at promoting breast-feeding, proper weaning, proper nourishment of pregnant women and lactating women and the promotion of production of nutritious foods.

Growth monitoring provides a mechanism for ensuring adequate nutrition through promoting growth, extending coverage to the most needy, and, ensuring comprehensive health care that is integrated with nutrition services at an individual level. At the village and community levels, the data generated from the growth monitoring activities could provide a basis for estimating the prevalence of malnutrition, evaluating the nutritional effect of programs and estimating the coverage of services. Many countries have on-going child weighing activities as part of health programs and there is widespread interest in linking growth monitoring and nutritional surveillance.* Data generated from growth monitoring activities are potentially useful for community nutritional status assessment and nutritional surveillance. Such data can be used for:

(a) Identification and description of nutritional problems for project or program design.

(b) On-going monitoring and evaluation of programs.

While data may sometimes be available to allow a reasonable definition of problems, they are not analysed because those involved in project design may not have the technical expertise to use this information. Hence,

*Throughout this document the term growth monitoring refers to the monitoring of nutritional status on an individual basis; the term nutritional surveillance refers to the monitoring of nutritional status at the community level for the purpose of program planning, management and evaluation.

nutritional assessment may be inadequate, leading to inappropriate project design. Furthermore, in spite of the general agreement that monitoring is essential to ensure that projects are proceeding as planned, few programs have a reliable system of monitoring progress and evaluating the effectiveness of their efforts[4]. The problem is compounded by:

(a) The absence of a satisfactory method of gathering nutritional status information in a quick, reliable and cost-effective way.

(b) The multiplicity of methods for the analysis and interpretation of nutritional data.

(c) The lack of adequately trained health workers, especially at the community level, and lack of middle level supervisors in the use of data collected to monitor and evaluate programs. It is hoped that this document will serve as an initiative towards the alleviation of some of these problems.

The objective of this document is to offer some guiding principles in assessing the need for nutritional surveillance in each country and to assist those countries, where nutritional surveillance is found to be needed and feasible, to develop an appropriate nutritional surveillance system that meets their needs within the existing constraints. These guidelines are intended for those who are involved in the design and development of nutritional surveillance within the health sector. Therefore, the focus is primarily on showing how nutritional

surveillance may be developed from growth monitoring activities* which are implemented as part of the primary health care strategy. A brief discussion on the use of surveys to generate data for nutritional surveillance is also included. These guidelines do not include instructions on measurement techniques (e.g. weighing). The focus is on the following:

(a) Development of guidelines for determining information needs for definition on nutritional problems and for on-going monitoring, evaluation and management of programs.

(b) Development of methodologies for the gathering and analysis of data to meet the needs identified in (a), above.

The process developed in this document is by no means definitive. Rather, the intention is to provide a structure which can be adapted according to local conditions. The forms and charts serve as examples from which users of these guidelines may develop their own. The approach taken to developing nutritional surveillance is to first identify the purpose and users of nutritional surveillance information, then plan the data gathering. It emphasises the necessity to link data collection to decision making. Information for decision making is needed at various levels -- the community, provincial, regional and national levels. Since the kinds of decisions that are made at these different levels vary, the kinds of information needed by decision

*More discussion on how the objectives of growth monitoring and nutritional surveillance may be reconciled can be found in Chapter IV.

makers at the different levels also vary. This document is mainly concerned with the information needs of the health worker who serves the community, so that s/he can assist the community in developing their programs, and so that s/he can manage the resources put in by the health organization funding these programs.

Because of the nature of the process, a desirable prerequisite for successful implementation of nutritional surveillance is that those involved should be literate[5]. Data can be recorded using special methods for those who are not literate, but the analysis and dissemination of the resultant information requires an ability to read and write. Therefore this document is of use only where health personnel have achieved the level of literacy required and an infrastructure exists to allow data to be collected, analyzed, disseminated and used to support decision making.

CHAPTER II

DEFINITION AND PRINCIPLES OF NUTRITIONAL SURVEILLANCE

Definition of Nutritional Surveillance

Habicht, Lane and McDowell[7] state that "nutritional surveillance is concerned with the present and future impact of factors affecting nutritional status and nutrition itself." The Cornell Nutritional Surveillance Program (CNSP)[6] definition is "to watch over nutrition in order to make decisions which will lead to improvements in the nutrition of populations." Put either way, nutritional surveillance is composed of:

(a) Nutritional assessment, which includes the measurement and description of the nutritional status of a population in relation to those economic, socio-demographic physiologic variables that can affect the nutrition of that population[7].

(b) Nutritional monitoring, which is the measurement of changes over time in the nutritional assessments at regular intervals[7].

(c) linkage of results of nutritional assessment and nutritional monitoring to decision making and action so that problems can be detected early and quickly corrected[6].

Purpose of Nutritional Surveillance

The purpose of nutritional surveillance is to monitor populations for changes in nutritional status and to respond to these at the earliest sign of deterioration. Response is

relevant at the population level, rather than at the individual level.* The specific objectives of nutritional surveillance are[7], quote:

(a) 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 changes in these features.

(b) To provide information that will contribute to the analysis of associated factors and so permit a selection of preventive measures, which may or may not be nutritional.

(c) To promote decisions by governments concerning priorities and the disposal of resources to meet the needs of both normal development and emergencies.

(d) To enable predictions to be made on the basis of current trends in order to indicate the probable evolution of nutritional problems. Considered in conjunction with existing potential measures and resources, these will assist in the formulation of policy.

(e) To monitor nutritional programs and to evaluate their effectiveness.

(end of quote)

Nutritional surveillance systems can be classified according to the purpose of the system. The purpose could be one of the following:

(a) To support planning.

(b) For monitoring and evaluation of programs.

(c) For early warning and intervention to avert crises.

Decisions which are made using nutritional surveillance data concern policy issues, day to day management and on-going monitoring and evaluation of programs. The use of data from

*The health sector is an exception, since nutrition interventions for individuals are the responsibility of the health sector primarily.

the health sector, and other sectors (where it is relevant and feasible) should lead to improved program design and management. The managerial goals of nutritional surveillance are similar to those for the WHO Risk Approach[8]. These are:

- (a) Promote fuller coverage.
- (b) Optimize use of resources.
- (c) Upgrade the monitoring of services.
- (d) Provide an objective measurement of efficiency in terms of health and nutritional status improvement.

Principles of Nutritional Surveillance

Nutritional surveillance makes use of the principles of epidemiology to study the nutritional and health events in a population and to indicate ways for possible explanation. Surveillance can be carried out at various levels--national, regional or local levels. In primary health care, nutritional surveillance at the local and regional levels serves as a means to encourage health workers to use community-based thinking. This can be done by the use of simple techniques* to enable health workers to recognize health problems and become aware of the impact of their own work and to explain the "why" of health and nutrition events[9]. Health workers who are actively involved in surveillance should be able to constantly monitor and evaluate their own activities and the effect that

*Growth monitoring is an example of such a technique. The use of this for nutritional surveillance will be discussed later.

these activities have on the community as a whole. To do this they need to be able to analyze, interpret and use the information they collect[9,10]. Mechanisms that link the surveillance activities to an active program must exist to allow the information to support decisions and direct actions.

In many countries, epidemiological information is used primarily at national levels by planners. In the move towards more community-based health care systems, it is becoming increasingly evident that health workers at the village and district levels also need to be given the authority and training that will enable them to analyze and interpret some of the information so that they can participate in decision making and program planning.

Briefly the basic principles of nutritional surveillance [11] are:

(1) The process is continuous and is based on regularly collected information--this information may be from routine administrative health records or from surveys which are conducted on a regular basis.

(2) The purpose of the system is to use the information collected to determine what kind of actions are needed to improve the nutrition status in the population as a whole.

(3) The system must be accompanied by action programs--therefore the information must be analyzed in time for the initiation of an early response. Appropriate structures and resources must exist to allow the collection, dissemination and use of information.

Workers at all levels need to be involved in the operation of the system. If given the skill and authority to analyze and interpret information, the health worker can use this information to mark his progress toward the objectives or targets set by the program. This could serve as motivation for action, especially if the health worker and the community are involved in decision making. If community participation is to be encouraged[12], the community needs to have access to adequate information on which to base decisions. With adequate training and support, community health workers can be taught to tap on surveillance systems as a source of information. Hence, information collected and analysis at the local level need to be simple so that health workers at the local level can understand and use the information. At higher levels, the system can be more sophisticated depending on the type of information needed and the resources available for data processing and action in response to problems.

Nutritional Screening

Nutritional Screening is distinguished from surveillance because it is a clinical function which attempts to identify individuals for nutritional intervention[13]. In contrast to nutritional surveillance, it does not require a knowledge of the baseline or past situation. Change is not a concern in screening but it is a major concern in surveillance. Another difference between screening and surveillance is that in screening different needs and local circumstances play a role

in determining the best indicator and its cut-off points.[13]
The indicator chosen for surveillance must be sensitive and
specific* to detect change, which is the main concern in
surveillance[6].

*More information on the sensitivity and specificity of
indicators can be found in:

(1) Habicht, J.P. "Some characteristics of indicators of
Nutritional Status for Use in Screening and Surveillance. Am. J.
Clin. Nutr, 33:531-535, March 1980.

(2) Habicht, J.P., L.D. Meyers, C. Brownie. "Indicators for
Identifying and Counting the Improperly Nourished. Am. J. Clin.
Nutr., 33:1241-1254, May 1982

(3) Drake, W.D., Roy Miller, R.J. Timmons. "Effect of
Classification Errors upon Evaluation Outcomes: Nutrition
Programs Revisted." Community Systems Foundation, June 1984.

CHAPTER III
GUIDE FOR ESTABLISHING NEED FOR NUTRITIONAL SURVEILLANCE
AND ITS FEASIBILITY

ESTABLISHING THE NEED FOR NUTRITIONAL SURVEILLANCE

The purposes served by nutritional surveillance could be one or a combination of the following, depending on the type of problems that exist and the resources available to deal with these problems. These purposes are:

- (1) for program planning
- (2) for program monitoring and management,
- (3) for on-going program evaluation.

In this chapter, we provide a structure for determining if nutritional surveillance is needed. Before embarking on data gathering it is necessary to clearly identify who the users are likely to be and what kind of information they are likely to need [6,14,15]. Once this is clearly established, only then is it relevant to determine how data will be gathered, analyzed and presented.

Nutritional surveillance can be an expensive undertaking as it requires:

- (a) staff with specialized skills in data collection, analysis and interpretation;
- (b) staff time in data collection, analysis and interpretation and supervision of these task; and

(c) computer facilities for speedy data analysis.

It is therefore necessary to establish the need for nutritional surveillance before embarking on such an undertaking. At the same time, it is also necessary to establish that nutritional surveillance will be feasible. A thorough initial assessment is therefore a pre-requisite[6]. In addition to justifying the need for nutritional surveillance, the initial assessment will provide a baseline if sufficient information is available.

GUIDE TO DOING AN INITIAL ASSESSMENT

The following steps, identified by the Cornell Nutritional Surveillance Program[6], will assist in drawing up a work plan for initiating or continuing* nutritional surveillance. These steps are not consecutive and they may need to be repeated several times as each step will reveal information that will be useful in answering questions raised in other steps. The main steps are:

1. Decide who are the users of the information, where and what kind of responses can be initiated, and what kind of decisions these users can make. This will assist in determining the purpose and type of surveillance needed. This step is crucial; it is central to the development of nutritional surveillance which is useful only if it delivers data that provides information that supports decision making.

*If nutritional surveillance is already being carried out, it is useful to periodically reassess the existing system.

- o Define the nutritional problems as the type of surveillance system depends on the nature of the problems and what kind of actions can be taken.
- o Identify the information that are already available and the additional information that need to be collected. Baseline information needs should also be included.
- o Described the proposed use of the information, including proposed outputs. The types of decisions that potential users will make and the type of actions that can be taken by the families, the community and health workers should be considered if surveillance information is to be used for program monitoring and management.
- o Identify sources of data, the institutions that will be involved and the institutional arrangements for data collection, analysis, and dissemination of information. This should include the identification of staff and training needed, an estimation of the cost for setting up the system and operating it, and a description of linkage of nutritional surveillance to decision making.

Nutritional surveillance is only justifiable if clearly defined nutrition interventions are identified, appropriate resources for implementation are available, and there is political willingness to act and use data to support decision making. An initial assessment is necessary for the design of an appropriate system. It is a major undertaking that requires its own funds and staff. The outcome of the assessment could

well be that nutritional surveillance is not required or not feasible--such an outcome should not be viewed negatively as nutritional surveillance must serve a clear purpose and must be carried out cost-effectively. If it is decided that nutritional surveillance is needed, the initial assessment should lead to descriptions of:

- o Type and purpose of the surveillance system
- o Nutritional problems that will be addressed
- o Information that will be needed, including a baseline statement, identification of existing data sources and gaps in information.
- o Institutional arrangement needed--this should include staffing needs, financial needs and logistics for support and supervision.

From this information, an appropriate nutritional surveillance system can be designed. This plan can then be used to obtain the resources needed to sustain nutritional surveillance.

AIDS FOR CONDUCTING AN INITIAL ASSESSMENT

To assist in conducting the initial assessment, some forms* have been developed and are presented in this section. The process of doing assessment is an iterative one, hence it is not possible to recommend any particular sequence of steps. A useful starting point may be the definition of nutritional problems to be addressed and the desired purpose of nutritional

*Design of forms based on framework for initial assessment recommended by Cornell Nutritional Surveillance Program.

surveillance for the country/situation concerned. Next, proceed to evaluating the existing data sources and institutional arrangements. As one proceeds through these steps, each step will reveal information that will have implications for other steps. Hence, one should not expect to proceed linearly from A to D, but rather, one should find it necessary to go back and forth to make modifications in previous steps, given the information that is shed in other steps.

A. Definition of Nutritional Problems

In defining the nutritional problems it is useful to draw up a preliminary epidemiological model. This will assist in identifying causes of nutritional problems and possible interventions and in turn assist in determining what kinds of data need to be collected.* The epidemiological model should be drawn up locally, based on information that is available at the time. In the beginning, the model will be preliminary. As more information becomes available, the model can be modified so that it reflects the real situation more accurately. The following questions developed from a model by Montoya-Aguilar [9] serve as a guide for obtaining information when drawing up a model as shown in Figure III-1.

*It will not be possible to collect comprehensive data in most cases. Each sector could be responsible for collecting data that are relevant to the types of interventions each can offer. If similar sampling procedures are used, the various data sets can be merged to provide a more complete picture of the situation.

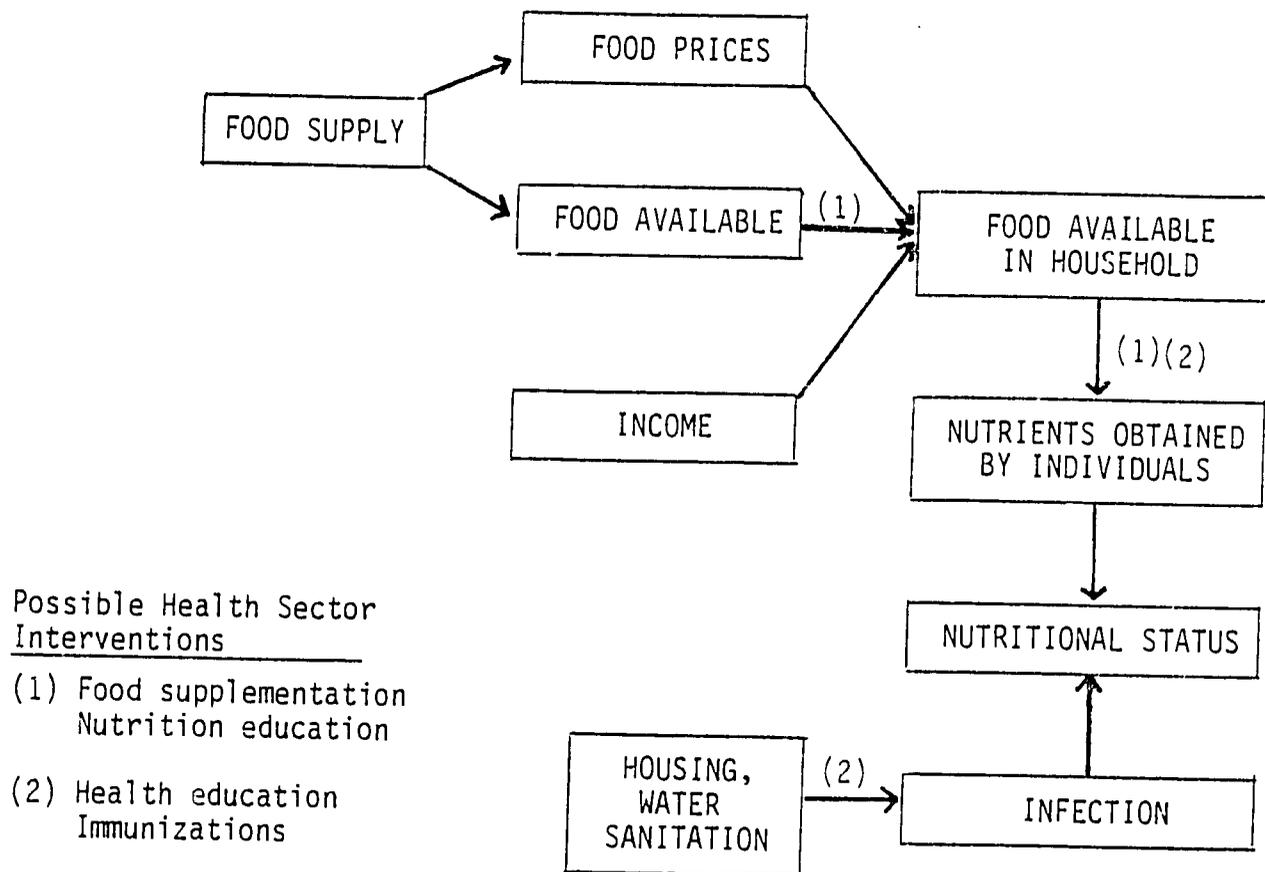


Figure III-1: EXAMPLE OF AN EPIDEMIOLOGICAL MODEL
Adapted from example developed by Mason et al. (6)

1. What kind of nutritional problems are commonly seen?
2. How much of this problem is seen?
3. When does it occur?
4. Where does it occur?
5. Who does it affect?
6. Why does it occur?
7. What can be done by
 - (a) the families of the malnourished children,
 - (b) the community as a whole and,
 - (c) the health sector?

This will entail the organization of some data collection which should not be complicated. A rapid assessment, based on the questions listed above should suffice. The data needed to answer these questions are shown in Table III-I. Questions 1 to 5 above, are sufficient to describe the nutritional situation but questions 6 and 7 need to be answered to determine what kinds of actions need to be implemented to improve nutritional status. The data generated from questions 1 to 6 (Table III-1) will be useful in filling out Table III-2. In addition to assisting the definition of the problems that need to be addressed, this information can also assist in specifying concrete objectives for programs that are designed to address the existing nutritional problems.

B. Definition of Type and Purpose of Nutritional Surveillance

A clear statement of the purpose of nutritional surveillance [6,16] is necessary to ensure that data collected will be

TABLE III-1

Questions to be answered and data needed for defining nutrition problems. This data can also serve as a baseline.

QUESTIONS	DATA NEEDED
1. Who are malnourished? How many?	Population census of community to provide a denominator. Nutritional status data for community, tabulated by nutritional categories and identifying characteristic, e.g. age and sex.
2. Where are the malnourished?	Nutritional status tabulated by geographical location or administrative zone.
3. What kind of nutritional problems?	Nutritional status (need weight, height and age) to determine if problems are acute or chronic. If problems are seasonal, time series data collected regular over few years would be useful.
4. Why do they occur?	Data on characteristics believed to be associated with nutrition status (e.g. weaning practices, childhood illness, family economic status) to determine relationship with nutritional status.

TABLE III-2: DEFINING PROBLEMS TO BE ADDRESSED

TYPE OF MALNUTRITION	GROUPS AFFECTED DEFINE IN TERMS OF: (1) GEOGRAPHICAL LOCATION (2) BIOLOGICAL GROUP (3) SOCIO-ECONOMIC GROUP	FACTORS ASSOCIATED WITH MALNUTRITION	DEFINE PROBLEMS TO BE ADDRESSED
- Acute protein-energy malnutrition	children at age of weaning, among poor families in urban areas	<ul style="list-style-type: none"> - cessation of breastfeeding - inadequate weaning food (rice gruel only) - high incidence of diarrhea 	<ul style="list-style-type: none"> - Improve weaning diet - Prevent diarrhea - Improve economic situation of family.
- Chronic protein energy malnutrition	children 6-48 months old in rural areas	inadequate diet due to food shortages	Improve conditions for food production and food distribution.

relevant and useful. The type of information that will be collected depends on the nature of the problems and the kinds of decisions which the users of nutritional surveillance information can make. Broadly, there are two main type of decisions that nutritional surveillance information can support. They are:

(1) Decisions concerning the allocation of funds-- this is the main concern of planners at regional and central levels.

(2) Decisions concerning the allocation of staff time, the designation of responsibilities, and the allocation and use of physical resources for program activities--this is the main concern of implementors of programs and their supervisors.

In any country, the need for information for both types of decisions exist. The real challenge is to determine how both of these information needs can be met without making the data gathering process cumbersome and expensive. One way to do this is to clearly specify the questions that will need to be answered for decision making in each situation, identify data that will be necessary for answering these questions, then determine where the overlaps and divergences occur so that data collection may be streamlined. Examples of questions and the data that might be needed for decisions for planning and program management are shown in Tables III-3 and III-4 respectively.

TABLE III-3

Questions to be answered to assist in program planning.

QUESTIONS	DATA NEEDED
<p>1. Are certain areas better off than others? What kind of characteristics are related to this?</p>	<ul style="list-style-type: none"> ● Nutritional status by area. ● Characteristics related to nutritional status, e.g. economic status of family, education level of mother, access to markets and services, agricultural resources that are available, source of income.
<p>2. Is the nutrition situation improving? Are the trends in the target groups the same as for other groups or are they better? What kinds of characteristics are associated with the groups that are (i) improving (ii) lagging behind?</p>	<ul style="list-style-type: none"> ● Nutritional status data over time, related to other possible causes of decline in nutritional status, e.g. epidemics, food shortages.
<p>3. Are the nutrition problems short term or long term?</p>	

TABLE III-4

Questions which need to be answered in program management and monitoring, assuming that the objectives and activities planned are appropriate.

QUESTIONS	DATA NEEDED
<p>(1) Who are the program reaching? Are those who are targeted receiving the services intended for them? If not, why not? How many people are being reached? How can services be improved?</p>	<ul style="list-style-type: none"> ● total number of recipients of services. ● % of those receiving services who are targeted ● % targeted who are actually receiving services
<p>(2) What is the effect of the program? Are the objectives of the program likely to be met? If not, why?</p>	<ul style="list-style-type: none"> ● Trends in the changes in nutritional status of the population as compared with the baseline.

These questions are by no means the only questions that can be asked. They are meant to be examples of the kinds of questions that should be asked. Since situations vary country by country in terms of nutritional problems that are prevalent, resources available for interventions and in the level of Primary Health Care development, it is not possible to provide a definitive set of questions that will be applicable in all situations. In this manual, we concentrate on developing guidelines for generating information to support decisions that are made in nutrition program management.

The specific decisions that health workers can make need to be clearly identified. One way to do this is to describe in detail the decisions and actions that health workers at different levels can make. An example is shown in Table III-5. Such a matrix is useful because it enables one to:

- o See how the roles of health workers at different levels are linked.
- o Identify the kinds of decisions and actions that each health worker is expected to take.
- o Identify the kinds of information needed for decision making.
- o Identify sources of information.

Using Tables III-3, III-4 and III-5 as guides to gather information, the type and purpose of nutritional surveillance can be described and summarized using table III-6.

USER AND LOCATION IN HEALTH SYSTEM	ROLE IN PROMOTING NUTRITION, TREATING OR PREVENTING MALNUTRITION	DECISIONS/ACTION TAKEN	INFORMATION NEEDED TO SUPPORT DECISIONS/ACTIONS	SOURCE OF INFORMATION (EXISTING OR POTENTIAL)
Community or village health worker. Village level, responsible for population in village only.	<ol style="list-style-type: none"> (1) Weigh children to identify those at risk. (2) Assist mothers in improving care and feeding of children, through nutrition counselling and if available, by providing food supplements. (3) Refer severely malnourished children for treatment. (4) Work with other community development workers, e.g. agricultural extension officers to promote food production and consumption for good nutrition. 	<ol style="list-style-type: none"> (1) Refer severely malnourished children for treatment. (2) Provide assistance, e.g. food supplements or nutrition education to mothers of mildly malnourished children and those at risk. (3) Promote family self-help and community nutrition actions. 	<ul style="list-style-type: none"> • Nutritional status of children-- need to be able to <u>diagnose</u> severe and moderate malnutrition. • Need to establish that inadequate diet and that lack of information are linked with poor nutritional status. • Need to establish that nutrition problems are affecting enough of the community to justify community action. • Total number of people in village and percentage in need of special care. 	<ul style="list-style-type: none"> • Weights, age from routine weighing. • Mother, by interviewing mothers. • Community profile of nutritional status and associated factors from above.
Clinic supervisor. Health post, responsible for supervising community health workers and for supervision of clinic held at health post.	<ol style="list-style-type: none"> (1) Organize weighing of children and diagnoses of nutrition problems. (2) Identify nutrition problem interventions required for area that C/S is responsible for, i.e. collated, analyse and interpret info collected by CHW. (3) Monitor progress and effect of nutrition actions for own area. (4) Organize community nutrition actions. 	<ol style="list-style-type: none"> (1) Identify and request for resources required for nutrition intervention (2) Plan and implement nutrition actions. (3) Modify plans if objectives of program not being met. 	<ul style="list-style-type: none"> • Total number of children and women in area. • Number of children weighed and receiving regular health services. • Effect of nutrition and health activities on nutritional status. 	From records of community/village level health workers.
District level supervisor (e.g. nutritionist) public health dietitian. District level health post, responsible for co-ordinating and directing nutrition activities in district.	<ol style="list-style-type: none"> (1) Provide support and training to clinic and community/village level staff in carrying out growth monitoring activities. (2) Assist clinic level staff in identifying and planning nutrition interventions needed for communities they serve. (3) Co-ordinate nutrition activities for the District and liaison with central level to make sure that nutrition activities/ programs planned at national level are in accordance with real needs of the community. (4) Supervise nutrition activities carried out at clinic and community level. (5) Work with other sectors to ensure that their programs promote nutrition, i.e. provide them with nutritional status data and discuss their implications for funding of programs. 	<ol style="list-style-type: none"> (1) Determine staff needs to carry out nutrition actions (e.g. how many workers? How much should be spent on nutrition activities? What are their training needs?) (2) Provide other sectors with nutritional status information and discuss the implications of their program for nutritional status. Assist in developing their programs so that they promote nutrition. 	<ul style="list-style-type: none"> • Total number of women and children in District, % covered by health services, % at risk, % of at risk actually reached by services. • Outcome of nutrition activities e.g. changes in prevalence of malnutrition, nos. of children improving, not improving as a result of nutrition interventions. • Staff and resources available for District 	<p>Records of clinic supervisors.</p> <p>Budget, staff register</p>

26

TABLE III-6: DEFINING THE PURPOSE OF NUTRITIONAL SURVEILLANCE

USERS	DECISIONS/ACTIONS TO BE TAKEN	PURPOSE OF NUTRITIONAL SURVEILLANCE
community health worker	Make plans for home visits to those not reached	- provide data on extent of coverage by primary health care services, especially identifying those not reached.
Community health worker, village development committees and members of community.	Develop programs/actions to address the health and nutrition problems affecting the community.	- provide data on most common health and nutrition problems so that health workers can work with community to develop community-level interventions.

C. Identifying Information Needs and Data Sources

The objectives* of the Primary Health Care strategy should be the main guide in determining information needs for program monitoring, management and evaluation. The data collected should lead to answers to questions raised about why certain problems exist and what can be done about these problems[9]. The information generated should be relevant for action, and should reflect the problems seen and the scope of services provided[9]. The methods for data collection and analysis should match the capability of the staff to use the data.

As indicated earlier, the type of information needed depends on the purpose of nutritional surveillance. This, in turn, is related to the questions that are being raised and the kinds of decisions that users of the information can make. Examples of these questions and the data needed to answer these questions were shown in Tables III-1, III-3, III-4 and III-5. A framework for evaluating existing information sources and identifying additional information needed is shown in Tables III-7 and III-8. When assessing the utility of existing data, the following questions are useful guides.

- o Is the information useful or necessary? The criteria for determining this should reflect the priorities and objectives of the PHC program, and the use for decision making[6].

*These should be clearly defined and sufficiently operational to identify critical questions which should be answered.

TABLE III-7: FRAMEWORK FOR EVALUATING EXISTING DATA SOURCES

Variables	b Source & method of collection	c levels of disaggregation	d Is data analysed in time?	e Reliability and representativeness	f Relevance to questions addressed - specify Q.
weight age sex	<ul style="list-style-type: none"> - MCH clinic, routine. - weight, age, sex recorded on weight charts and clinic register. 	<ul style="list-style-type: none"> - by village and district 	<ul style="list-style-type: none"> No analysis done on data 	<ul style="list-style-type: none"> - Not representative since data available on for those who attend MCH clinic. - Variable reliability as supervision of weighing is sporadic. Some clinics do better than others. 	<ul style="list-style-type: none"> With more complete coverage and improvements in measurement skills, data can provide answers to "who is malnourished, how many and where are they located."

a,b,c Describe existing data sources

d,e,f Criteria for evaluating these need to be established locally in relation to purpose of nutritional surveillance

TABLE III-8: FRAMEWORK FOR DESCRIBING ADDITIONAL DATA NEEDS

Variables	Source & method of collection	a Levels of disaggregation desired	b Frequency of collection required	c Accuracy and representation	d Questions addressed
Age of weaning Feeding patterns during and after weaning.	Routine data, collect concurrently with growth monitoring.	For each child, by village.	(a) once (b) depends on pattern: need only to record major changes.	data needed on children being weaned only.	What are some of the reasons for malnutrition in children? Is it associated with weaning?

a,b,c,d Criteria for these need to be established in relation to purpose of nutritional surveillance

- o Do the data currently collected provide answers to questions raised? If not, why not? What else needs to be collected?
- o Can the data be disaggregated usefully? The epidemiological model that is drawn up during the problem definition stage and the dummy tables developed when determining the purpose of nutritional surveillance should assist in determining the characteristics that data need to be disaggregated by. The input, output and outcome variables and their inter-relationships should be identified as this will assist in identifying data needs.

Reinke[17] stresses that ruthless selectivity needs to be exercised. The data collected need to be related to problems and progress in the solving of these rather than on comprehensive analysis. The indicators chosen must also be sensitive and specific to detect changes.

De Sweemer et al.[16] identify seven guiding principles that are useful in determining data needs that are relevant to health programs. These are:

(1) In order to ask the appropriate question, there must be dialogue between those who design, gather and analyze data and those who use the findings.

(2) It is necessary to clearly define the purpose of any data collection effort. Decisions about what data not to collect are as important as decisions about what should be gathered.

(3) If data collected is part of a research effort, the research must benefit the people studied either directly or indirectly.

(4) Health interventions are part of a broader "health system," therefore must be viewed within this context. That is, the effects of certain non-health activities (e.g. agriculture, economic activities) on health must be considered when they are relevant. Information on the specific effects of the subsystem of health delivery should be viewed under the headings of input, output and outcome (input = human and financial resources; output = coverage, utilization rates; and outcome = impact of services on health status).

(5) Data gathering methods must be field tested to simplify procedures.

(6) Study results are affected by the validity of study procedures, therefore procedures used must be developed with care. This means taking into consideration the specific population and cultural context in which the study will be conducted.

(7) A choice has to be made about the level of accuracy sought. This should be based on consideration of the utility and cost of collecting the information. Complete accuracy is unreachable, but reliability should and can be measured by spot checking and by statistical means.

Whenever possible, nutritional surveillance systems should be built on existing information systems[6]. In most countries the health sector is the main source of information on nutritional

status. This information may come from routine clinic records (such as in Jamaica[18], El Salvador[19] and Botswana[20]) or from specially conducted on-going surveys Household Expenditure Surveys, Kenya and (e.g. Operation Timbang in the Philippines)[6]. Both methods of data collection have advantages and disadvantages. The advantages of a system that utilizes routine clinic information are:

(a) No special effort has to be made to collect information. The addition of nutritional status indicators to the existing health information system will enhance the information base, which usually includes information on disease patterns and coverage by the health services.

(b) If attendance at clinics and follow-up is good, and an attempt is made to reach out to those who do not attend clinics, the routine clinic information can be representative of the population. From this data base, trends can be delineated over time.

(c) If coverage is good, it is usually possible to get information on all areas of the country. This is particularly useful for national level planners and administrators.

The disadvantages of this system of data collection are:

(a) Data may not be representative of the population as those who attend clinics are self-selected.

(b) Large volumes of data can accumulate, unprocessed. In many health clinics, staff have neither the training nor time to handle large volumes of data. This however, can be overcome

by sampling* as this facilitates the analysis of the data while retaining the representativeness of the data collected[6].

(c) Data may be of poor quality because of poor training in taking measurements and lack of supervision of data collection.

Sample surveys help to overcome the problems of the biases mentioned above. They can also provide a wider range of data, thus allowing a more complete analysis of the associated factors of malnutrition. However, they are often expensive to conduct, especially if the samples are large. Costs may be reduced by involving the community. To do these surveys regularly, a special unit with specially trained permanent staff has to be set up. Some countries, such as Kenya, have set up such a unit, with external financial support, but generally many countries cannot afford to set up such units. Also, since the data are only generated periodically from these surveys, their usefulness for monitoring is limited. Another drawback is that data is often not analyzed in time to be useful to program managers. Both methods will be discussed in greater depth in the next chapter.

*Some alternative ways of sampling suggested by CNSP are:
(1) Recording and tallying all weight-for-age data on selected clinic days.
(2) Recording and tallying data for every nth child.

In summary, the data sources selected should fulfil the following:

- o deliver data regularly
- o allow for timely analysis
- o generate data that are representative of the population
- o generate data that are accurate and reliable
- o be cost-effective
- o be manageable by the existing staff and facilities available.

(D) Identifying Institutional Arrangements Needed

Once the purpose of nutritional surveillance is established and data needs and sources are identified, the next step is to identify the existing institutional arrangements which may be utilized and the additional resources that will need to be set up. When this stage is reached, one will already have a proposed nutritional surveillance system in mind. Therefore one would be in a position to draw flow chart for proposed nutritional surveillance system. An example is shown in Figure III-2.*

From this, one can then:

- I. a. Identify staff needs at each point.
- b. Identify future staff needed.

*The point is not to promote an idealised system but to stress that before one can assess staff and resource requirements for nutritional surveillance, one would have to have some idea of the system that is being contemplated.

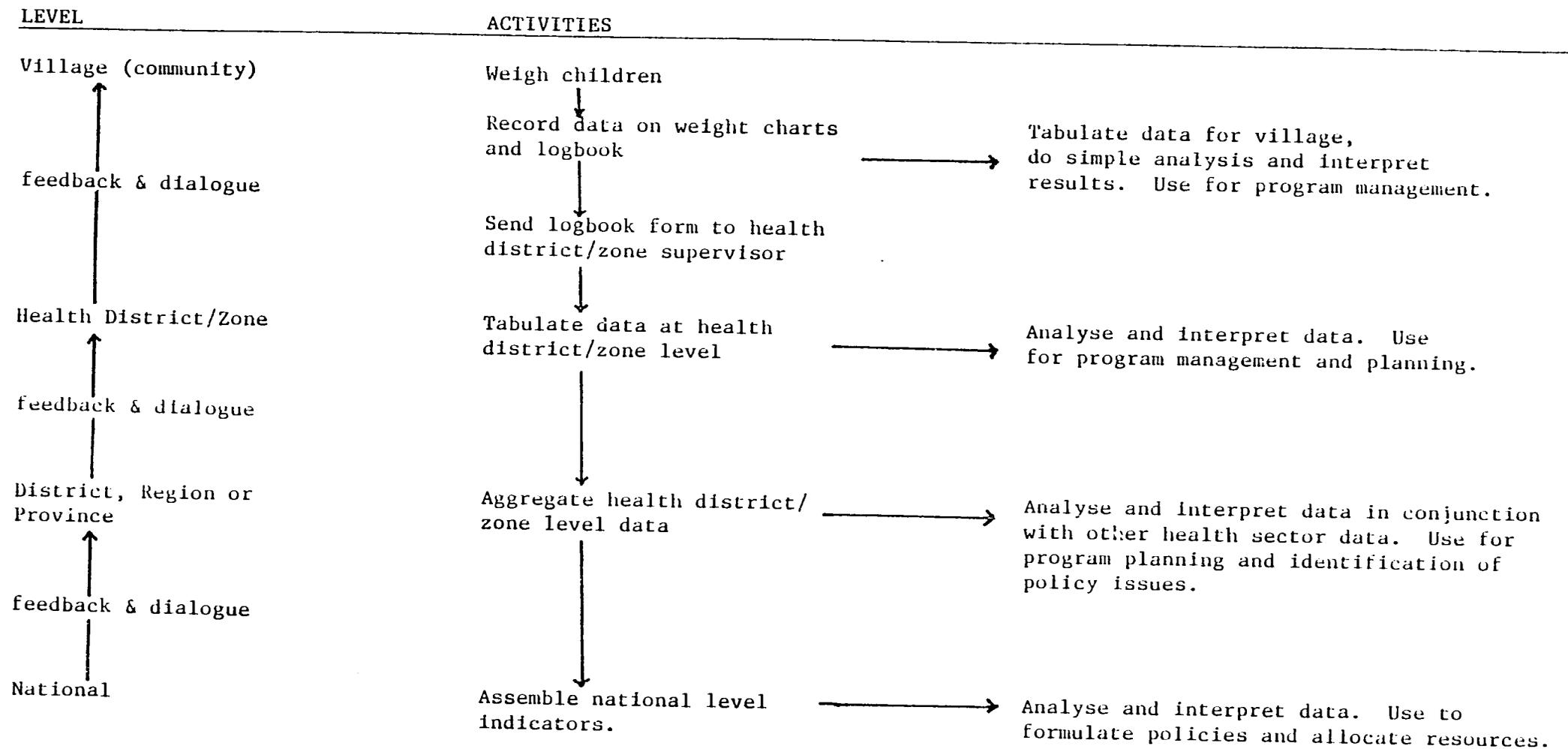


Figure III-2: Example of a Flow Chart.

This is a somewhat idealised illustration of what a system based on routinely collected nutritional status data might look like. The model is based on the assumption that data will be analysed and used at every level. In practice, this may be difficult, therefore each situation must be assessed in terms of the resources available for data collection and use, and the willingness on the part of the health organisation to allow decentralised decision making.

- c. Evaluate capability of existing staff (see Table III-9).
- d. Identify future training needed for staff.
- II. a. Identify institutions or facilities that will be involved.
- b. Evaluate capacity of existing facilities (see Table III-10).
- c. Identify institutional linkages that will be needed i.e. what kind of communication exists now between different levels within the health sector and between the health and other sectors? What must exist in order to make it possible for nutritional surveillance information to be disseminated?
- III. a. Identify resources needed (i.e. funds, equipment, transport).
- b. Evaluate the adequacy of existing resources.
- c. Identify the minimum additional resources needed.

Using the information generated, a summary of the institutional arrangements and resources needed can then be made. From this, one can determine if the proposed nutritional surveillance system is feasible. Depending on the outcome, one may find it necessary to retrace steps and reconsider the proposed plans. The feasibility of establishing nutritional surveillance in any country rests ultimately on the institutional arrangements that can be made to implement the nutritional surveillance activities. The basic elements

TABLE III-10: Guide for assessing the capacity of existing health facilities for nutritional surveillance.

Nutritional Surveillance Activity	Health facility and location				
	Health post, village.....	.....	.....	.....	.....
a. census of children and households	ii, iii				
b. weighing of children (growth monitoring)	✓				
c. recording data	✓				
d. tabulating data	ii, iii				
e. analysis of data	ii, iii				
f. interpretation	ii, iii				
g. use of data					
• for community diagnosis	ii, iii				
• to estimate coverage	ii, iii				
• to guide program management	ii, iii				
• to estimate program effect	ii, iii				

Criteria: To carry out these activities, the following must be met:
 (i) the health worker is literate, (ii) s/he has received training to carry out the specific activity,
 (iii) manuals or guidelines are available or, there will be regular supervision of these activities.
 PUT A ✓ WHERE ALL 3 CRITERIA ARE MET, OTHERWISE LIST THOSE NOT MET AND CIRCLE THOSE THAT CAN BE
 MET IN THE NEAR FUTURE.

TABLE III-9: Guide for assessing the capability of staff in carrying out nutritional surveillance activities.

Nutritional Surveillance Activity	Staff, location, type of facility				
	CHW in village health post	.....	.....	Nurse at health center	.....
a. census of children and households	(iii)				
b. weighing of children (growth monitoring)	(iii)				
c. recording data	(iii)				
d. tabulating data	i, (ii), (iii)				
e. analysis of data	i, ii, (iii)				
f. interpretation	i, ii, (iii)				
g. use of data					
• for community diagnosis	ii, (iii)				
• to estimate coverage	(ii), (iii)				
• to guide program management	(ii), (iii)				
• to estimate program effect	ii, (iii)				

Criteria: To carry out these activities, the following must be met:
 (i) the health worker has time to carry out the activity, (ii) s/he has the skills to carry out the activity, (iii) the coverage by the health facility is adequate to generate the data needed.
 PUT A ✓ WHERE ALL 3 CRITERIA ARE MET, OTHERWISE LIST THOSE NOT MET AND CIRCLE THOSE THAT CAN BE MET IN THE NEAR FUTURE.

required are:

- o People with the necessary skills to set up and run the system.
- o Financial resources to pay staff and to provide physical inputs (e.g. equipment and transportation) needed to gather, analyze and disseminate data.
- o Political will to allow data to be used for decision making, especially decentralised decision making.

DESCRIPTION OF PROPOSED NUTRITIONAL SURVEILLANCE SYSTEM AND THE ORGANIZATION OF NUTRITIONAL SURVEILLANCE

The initial assessment will eventually lead to one of these three results:

(1) Nutritional surveillance is not needed.

(2) Nutritional surveillance is needed but not feasible. In this case, review what is proposed to see if it can be simplified.

(3) Nutritional surveillance is needed and is feasible.

In the latter case, a description of the proposed nutritional surveillance system and the organization of nutritional activities should result from the initial assessment. This description could be presented in a matrix, which includes the following:

(1) Nutrition objectives of the PHC program.

(2) Specific questions addressed by the program.

(3) Specific questions for which nutritional surveillance is needed.

(4) Description of data needed.

- (5) Source of information, method of collection and institutions involved.
- (6) Responsibility for data collection.
- (7) Responsibility for data analysis, interpretation and dissemination.
- (8) User of information.
- (9) Decisions supported by information.
- (10) Estimated cost for developing nutritional surveillance and additional resources (material and personnel) needed.

CHAPTER IV

DATA GATHERING FOR NUTRITIONAL SURVEILLANCE

Two alternative methods for gathering data for nutritional surveillance exist. One method is to build upon routine clinic data and the other is to institute specially designed surveys at regular intervals. Ideally, the use of both methods in one country is desirable as they will generate complementary data sets. However, given the disposition of most countries, few will be able to afford both. Therefore, a choice has to be made regarding the method that will be employed. This choice will primarily be determined by the purpose for which nutritional surveillance is required. Generally, surveys are more satisfactory when data is needed to support planning because of the wider range of information that is included, while for program management, on-going data which is routinely collected is preferable. For the latter, routine data is preferred because it is generated continuously. Furthermore, those for whom this data is useful are also involved in collecting the data. An example of such data is the growth monitoring data. In this chapter we will discuss how growth monitoring data can be organized to generate data that can be used for nutritional surveillance because of its potential usefulness for program management. The use of surveys for nutritional surveillance will also be discussed briefly.

Growth Monitoring and Nutritional Surveillance

The term "growth monitoring" describes an approach whereby the regular and continuous monitoring of the growth of children leads to actions that promote proper nutrition[21]. Growth monitoring entails more than just weighing of children and plotting of weights on weight charts. The results of any measurement must be interpreted and used to support decisions and actions taken to ensure that growth will be maintained at a satisfactory level. When used this way, growth monitoring acts as a tool to motivate the health worker to initiate actions to help and teach mothers how to prevent malnutrition.

The weight chart, based on weight-for age* is the most common instrument used for monitoring growth. The goals of growth monitoring are to promote continued satisfactory growth in well nourished children and to identify children who are malnourished or whose growth is faltering so that they can be assisted to achieve an adequate nutritional status. The identification of the malnourished and those at-risk should prompt the health worker to investigate the possible causes so that interventions can be offered to improve the child's condition before it reaches emergency status[21]. Generally, the interventions offered to these children and

*Other measures used are mid-upper arm circumference and weight for height and height for age. See Appendix A for a brief summary of the measuring tools and data recording instruments. More information on these are available in "Growth Monitoring" by Marcia Griffiths.

their families are in the form of one or a combination of the following:

- (1) food supplementation,
- (2) medical attention and,
- (3) health and/or nutrition education.

The usefulness of growth monitoring is not limited to the individuals and their families. The data generated from the growth monitoring activities can be aggregated to provide a summary statement of the nutritional status of the community in general. If data is collected on a regular* basis, the data can be aggregated and used for nutritional surveillance, e.g. for program monitoring, management and on-going evaluation.** Figure IV.1 illustrates how growth monitoring can provide data for nutritional surveillance wherein the main objective is to provide information to support decisions so that programs can be planned in accordance with existing problems and within available resources, and when implemented, be efficiently managed and evaluated.

The primary role of the health sector in nutritional surveillance is to deliver information on nutrition status. It is unique in its capacity to do this as it is the only sector that is in a position to collect nutritional status

*Definition of regularity still needs to be established.

**This evaluation will provide information on the gross outcome, rather than the impact of the program as participation in the program may be biased towards those within easy access of the health services. Also, potential confounding factors cannot be controlled for in ongoing service programs.

data on a continuing basis, and offer health and nutritional services at the same time. A logical source of nutritional status data would be growth monitoring activities. If nutritional surveillance indicators are based on ongoing growth monitoring activities, these must first be established before nutritional surveillance can be carried out. Therefore, the first requirement of health sector nutritional surveillance is to establish a reliable growth monitoring system that can generate data on a regular basis. Here caution needs to be exercised since the main objective of growth monitoring is to promote adequate growth rather than generate data for nutritional surveillance. (Data generation for nutritional surveillance is a secondary objective). A careful analysis of how the objectives of growth monitoring and nutritional surveillance may be met must be made otherwise growth monitoring could become a ritualistic data gathering activity that serves no well defined purpose. If this happens, neither the objectives of growth monitoring nor those of nutritional surveillance will be met.

In order that growth monitoring meets both objectives i.e. promote adequate growth and delivers appropriate data for nutritional surveillance, those who need data for nutritional surveillance need to work with those involved in growth monitoring to determine how the latter can generate data needed by the former. At the health center level, often the health workers located there fulfill both roles, thus providing a natural bridge for two complimentary activities. Since data needs are determined

by needs for decision making, and decision making takes place at various levels of a health service structure, consideration of these must be made when planning health sector nutritional surveillance.

The level of sophistication of activities that can be organized depends on the level of development of the Primary Health Care System. Therefore, growth monitoring and nutritional surveillance activities should be planned in accordance with the capability of the existing health service infrastructure, the resources available for equipment, and transport and the level of training of the available health workers. A graduation of nutritional status monitoring activities according to level of PHC Development, suggested by Wilcox et al.[22], is shown in Table IV.1

Involving Primary Health Care Workers in Nutritional Surveillance

While it has been relatively easy to define and specify the role of nutritional surveillance in supporting planning, management and evaluation of nutrition components of programs, it has been more difficult to operationalize these concepts[10]. These difficulties are often linked to inadequate resources and lack of training of staff to carry out nutritional surveillance. The community or village level primary health care worker is often responsible for collecting the nutrition information on which nutritional surveillance is based. Although primary health care workers are involved in the collection of a wide range of

Table IV-1: Gradation of nutrition status monitoring activities which can be supported at different stages of Primary Health Care System development.

Minimum	Intermediate	Advanced
<ul style="list-style-type: none"> o Clinical signs of mid-arm circumference screening to identify the severely malnourished, including undernourished pregnant women. o Referral of severely malnourished and complicated cases to nearest facility. 	<ul style="list-style-type: none"> ● Community self-diagnosis to identify vulnerable families. Registration of all families; creation of roster of children in target group to track need for, and receipt of PHC services. ● Periodic growth monitoring. Use of growth charts to target services (eg. supplementary feeding) and as an educational tool. ● Counselling mothers whose child's record shows faltering growth, with emphasis on breastfeeding, weaning, and child spacing. 	<p>In addition to the intermediate level activities:</p> <ul style="list-style-type: none"> ● Design and use of simple tally sheet to record growth monitoring and related data to serve as the basis for the health component of a nutritional surveillance system. ● Periodic community nutrition assessment to investigate causes of malnutrition identified through monitoring and related PHC activities. Identify appropriate intersectoral actions to address causes at community level. ● Eventual establishment of nutritional surveillance system based on growth monitoring and data from other sectors (eg. food production figures). Interpretation of data and identification of communities with special nutrition needs done at departmental or regional level; regular feedback of findings to community.

information routinely, they rarely make use of the information they collect. Some may recognize the potential usefulness of the information they collect, but they either lack the authority to make decisions, or simply are not able to make use of the information because they lack the training or time to do so. This applies to the use of data for problem diagnosis, and the monitoring and management of interventions at the individual and community level. In order to detect and respond to nutritional and other health problems early, health workers and their supervisors need to be given authority and taught to use information to make decisions about what kind of actions are needed to effect change. Given these skills, and encouragement they may also be more motivated to use the information collected to guide their decisions.

A number of problems are usually present, therefore the health worker has to decide which problems need priority attention. The use of information, such as that collected on Road-to-Health charts, can assist in making these decisions. Community health workers do not have direct influence on decisions on resource allocations and policy decisions, but they do make decisions concerning the management of their day to day activities. Information which health workers collect are usually passed on to their supervisors at higher administrative levels. If the health worker at the local level is taught how to use the information available to him, he can use the information to assist in implementing concrete and effective individual actions and in making suggestions to his supervisors to meet the needs of the community

he serves. Information can be used to guide the integration of nutrition activities into primary health care and other development programs by:

(1) The community health worker to rank the importance of nutritional problems in his/her area and allocate time devoted to nutritional activities accordingly.

(2) The middle level supervisors to assess needs in his/her area, determine how resources should be allocated, and guide the management of nutritional activities under supervision.

(3) The National level planners of Ministry of Health to develop nutrition programs and to integrate nutritional activities with other health sector programs.

(4) Multisectoral development committees to integrate nutrition activities with their programs.

To ensure that data will be used, a system of transmissal from source to users must exist. At a Manila workshop[10] on systems for monitoring and predicting nutritional status the participants felt that what was needed was "a system of organization and communication to collect, transmit, collate, interpret and utilize data in a coordinated manner." Users must have permission as well as the ability to use the data. One of main limitation of many existing nutritional surveillance activities is that they are mainly data collection exercises as those who collect the information do not know how to analyze or use the data.

Nutritional Surveillance Activities at the Peripheral Level

If health workers at the first level of contact are to become involved in utilizing the data they collect to guide program management, they must be trained to interpret the results of growth monitoring at the individual and community level. The procedures must also be simplified so that manual tabulation of the results is possible. Training and simplification of procedures for the health worker at the first level of contact is of critical importance as the reliability of the nutritional surveillance system that relies on growth monitoring data rests on the ability of these health workers to collect accurate and reliable data. A careful review of their existing workload and an estimation of the additional work that growth monitoring and nutritional surveillance imposes the health worker should be included when planning for nutritional surveillance. For growth monitoring the health worker must carry out the following activities.

- (1) Keep an updated register of children and households in their areas of responsibility.
- (2) Weigh children regularly,* either in the clinic or during home visits.
- (3) Record weights on weight charts and
- (4) Interpret results of weighing and provide counselling on nutrition where necessary.

*A consensus on the definition on regularity needs to be reached.

For nutritional surveillance, the growth monitoring process needs to be expanded to include a record of weights and other data, a summary of the results of weighing for the community, and the analysis, interpretation and use of these results.

A summary of these activities is shown in Figure IV-2. These activities take place in 3 phases.

- o Phase I: registration of children and households
- o Phase II: growth monitoring and data gathering for nutritional surveillance
- o Phase III: Analysis and use of data

These activities and some examples of tools which can be used to facilitate data collection are discussed in the subsequent sections. Here, we wish to re-iterate that nutritional surveillance must serve a clearly specified purpose therefore the activities described in the subsequent sections are useful only if they will be used for the purposed identified.

Registration of Children and Households

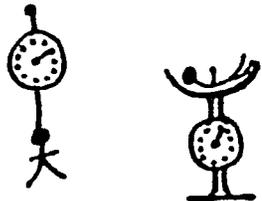
The health worker's first task in the implementation of growth monitoring and nutritional surveillance is to make a census of the population that he/she is responsible for. This task is essential for ensuring maximum coverage. This initial census of children and households provides the health worker with a register of all children and households. The register becomes useful later in assisting the health worker to identify those mothers and children who do not attend clinic and to organize visits to these homes to ensure that these families

1.



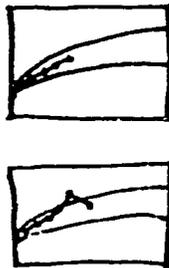
Registration of children and households

2.



weighing of children at regular intervals

3a.



Plotting and interpretation of weights on weight charts

Responding as indicated, e.g. provide education.

3b.

village		date	
name	age	sex	...
..
..
..
..
..
..
..
..
..

Recording of weight and other information in logbook

5a.

Village		Date			
age	N	GI	GII	GIII	Total
0-5					
6-11					
:					
Total					

Monthly summary of logbook forms to estimate prevalence of malnutrition

5b.

Report Form
Month
Village
Total children weighed
Total new children
⋮

Monthly summary of logbook forms to estimate coverage

55

Figure IV-2: Summary of Nutritional Surveillance Activities at the peripheral level.

receive health services, thereby ensuring optimum coverage. One way of keeping a register of the households and children in the health service area is to keep a family registration card (see Figure IV-3), for each family. This card can be updated periodically. The information can also be summarized annually (see Figure IV-4) to provide a denominator that is needed to estimate coverage.

Growth Monitoring and Data Gathering for Nutritional Surveillance

The activities which the health worker carries out in this phase are:

- (1) Weigh children
- (2) Record and plot weights on weight charts and logbooks
- (3) Interpret the weights and explain to the mother what this means
- (4) Provide counselling and other services (e.g. refer child for food supplementation) as indicated by child's health and nutritional status.

The tools needed for activities 1 and 2 are discussed below.

(a) Weight equipment

Numerous types of scales are available for weighing children. Much has also been written about the advantages and disadvantages of the different models that are available. Briefly, the main features that one should look for when selecting scales are:

- (1) sturdiness

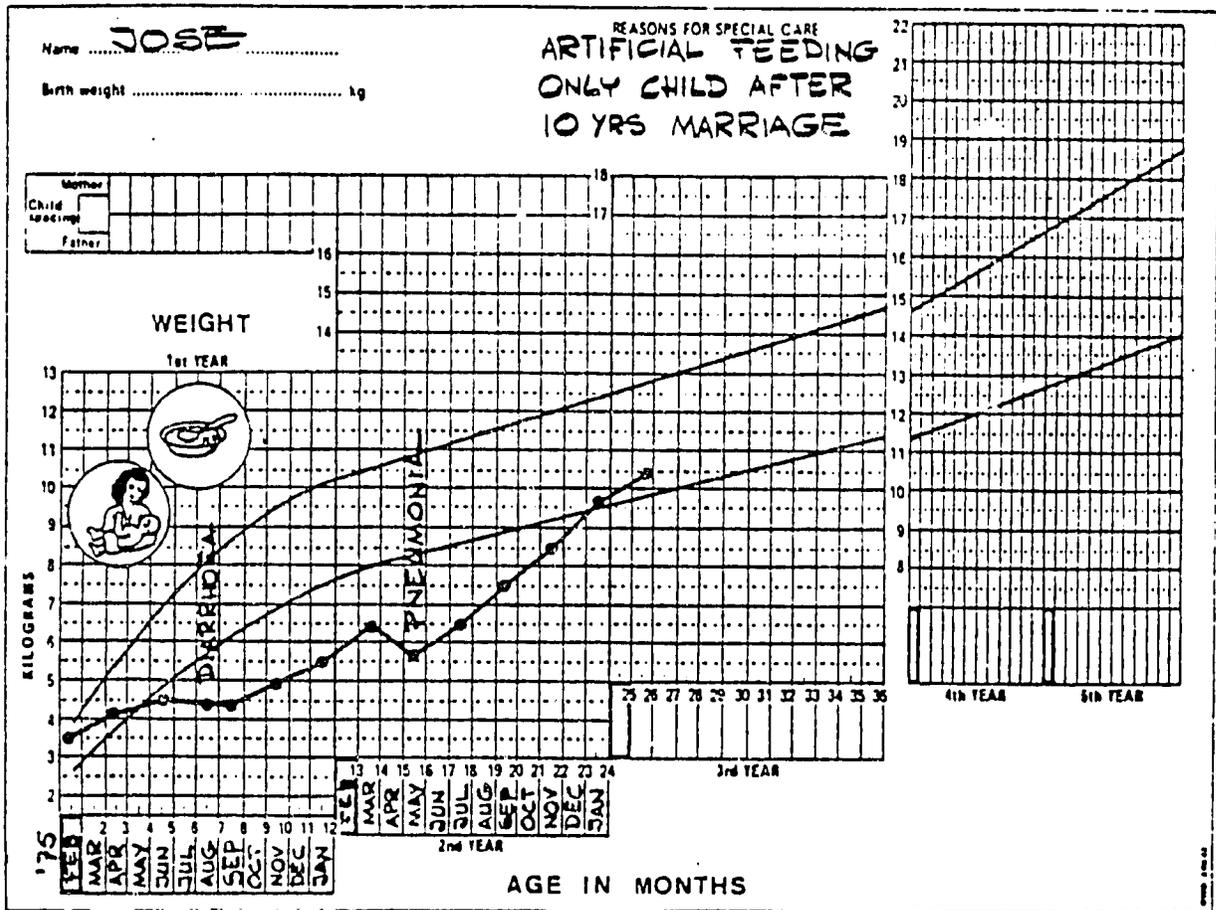


Figure IV-5: Example of Weight Chart, with information on nutritional status, illness and feeding methods recorded on it (24).

(2) accuracy - for children scales should be calibrated, at 100g intervals.

(3) if home visits and rallies are part of the strategy to increase coverage, the scales should also be portable.

In addition to the quality of the scales, those who carry out the weighing should also be trained in measurement to ensure that standardized weighing procedures are used. For more discussion on this, the reader should refer to the following document: Growth Monitoring by Marcia Griffiths, Primary Health Care Issues Series I, No. 3, American Public Health Association, 1981.

(b) Weight Charts

Numerous designs of the weight chart exists, each being adapted for local situations. The example shown below (Figure IV-5) is a standard chart developed by the World Health Organization[23] and is used in many countries. It has provision for recording the following information.

- Identification of child
- Birthdate, age
- Actual weight reference value (i.e. % of standard)
- Immunization procedures
- Infant feeding guidelines

The main objective of the use of the chart is to promote healthy child growth[23]. The chart enables the health worker to assess normal growth, determine deviations in individuals and interpret these in terms of health status. From this information, the health worker can make decisions regarding

types of care and referral procedures required. This information also provides a basis for monitoring community nutrition status as part of health and nutritional surveillance.

The chart is also useful to the mother, if she is taught how to interpret it. It provides her with a visual record of the nutritional and health status of her child, and a means for recording important events such as immunization, and the feeding patterns of her child. The record may be kept at the clinic or by the mother--ideally records should be kept by both. At the USAID's Asia Bureau Health, Population and Nutrition Officers Conference in Singapore, 1984[25], the participants stressed that if growth monitoring is to be successful in promoting adequate nutrition, mothers must be actively involved in the process. They emphasize that efforts have to be made to include children in growth monitoring activities before they reach 6 months of age. They also stress that the weighing sessions should be limited to include only 20-25 mothers so that there is sufficient time for health workers and mothers to interact. Uniformity of weight charts is also desirable to facilitate (a) the comparison of data from different parts of the country and (b) training for growth monitoring and nutritional surveillance.

The charts may be filled by mothers, if they are capable of doing so. Otherwise, village health workers, nurses, doctors or other suitable persons, such as teachers, can fill in the charts. To ensure that weights are plotted accurately and the weight is interpreted and used to guide action, the

users need to be given adequate training. Manuals on how to use the weight charts for monitoring child growth are available. References that can be used to guide training are:

- (1) A Growth Chart For International Use In Maternal And Child Health Care, WHO, Geneva, 1978*. [23].
- (2) Guidelines For Training Community Health Care Workers in Nutrition, WHO Offset Publication No. 59, 1982*. [24].
- (3) See How They Grow, by David Morley and Margaret Woodland, MacMillan Tropical Community Health Manuals, 1979. [26].
- (4) Tremlett, G., Lovel, H. and Morley, D. Guidelines for the design of national weight-for-age growth charts. In: Assignment Children, vol. 61/62, p. 143-175, 1983. [27].
(This is also available in French).

(c) Logbook Record Forms

The preceding activities (weighing and the recording of weights on the weight charts, interpretation of weights and intervening where necessary) are the basic activities for individual growth monitoring. If data from growth monitoring are to be used for nutritional surveillance, a system of capturing these data needs to be developed and put into operation. A number of systems, which we will call tally systems hereafter, have been developed and used. In the development of these tally systems, the approach is

*A shortcoming of this document is that it does not provide directions for concrete action.

to first determine what kind of information* is needed and how the data will be used. This approach was taken in Botswana, where nutritional status surveillance is being built on routine data generated from growth monitoring in health clinics.

An example of a tally system is the logbook form that has been recommended for the Botswana** surveillance program[28]. This is shown as Figure IV-6. The child welfare clinic Nutrition Logbook provides a means for recording and summarizing information which can be drawn from the weight charts. Information which can be recorded are:

- The identification of the health clinic
- Date
- Name of children weighed
- Sex
- Birthdate
- Weight measurements
- Growth status
- Action taken, specifically the provision of food rations
- Mother's education

*This in turn is determined by the purpose of nutritional surveillance.

**More information on the Botswana System can be found in Appendix B.

Figure IV-6:

Example of a Page in the Proposed CWC Nutrition Logbook (28)

Page

MONTH OF

Name of Clinic/Health Post/Mobile Stop:

Health Region:

Date of First Weight Recorded: Date of Last Weight Recorded:

Completed by:

CHILD'S NAME	Sex 1=M 2=F	BIRTHDAY		Weight (Kg)	At Risk (✓)	No Weight Gain (✓)	Food Rations (✓)	MOTHER'S EDUCATION		
		Month	Year					None	Some Primary	Some Secondary
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
⋮										
24										
25										
TOTAL (Add up tally marks)										

These variables* were selected because they have been found to be the most useful for the targeting and monitoring of drought relief programs[28]. This form is primarily designed for recording data generated from growth monitoring in the health clinic for transferral to a centrally based computer where this data can be analyzed and used for nutritional surveillance. However, columns 5 (At risk), 6 (No weight gain) and 7 (Food Rations) can be tabulated by the clinic health worker. Column 5 provides a profile of the prevalence of malnutrition, column 6 provides information on the changes in the nutritional status of the community and column 7 indicates who and how many children be receiving food rations.

The chart will be filled during the course of the clinic by the Family Welfare Educator (FWE) who also fills in the child's weight chart. The form will be filled out in duplicate; the original copy will be sent to the central statistical unit while the carbon copy will be retained by the clinic. This duplication of the records is important as this means that the clinic health worker can later (e.g. at the end of the week or month) compile his or her own clinic profile. Data sent to the regional level office is compiled and analyzed by the Regional Health Education Nutrition Officer (RHENO) to provide monthly prevalence figures. From these figures, the RHENO can identify areas

*The variables selected would depend on the purpose of nutritional surveillance. These should, therefore, be modified according to the local situation.

that need food assistance and initiate action to mobilize this assistance.

The training of health workers to compile and interpret these community profiles is critical if they are to be actively involved in nutritional surveillance. They need to be taught how to organize the raw data to provide indicators that they can use to guide the decisions they make and to monitor and guide the management of their health programs.

Ideally, analysis and interpretation should take place at various levels, beginning at the level of data collection. However, given the level of training of most village level health workers in developing countries, this ideal may not be possible to attain. In such situations, the next best alternative is to turn to an approach like the one used in Botswana, i.e. have the data sent to a higher level for analysis. When this is done, mechanisms must be set up to ensure that the information derived from the analyzed data is sent back in a form that can be understood and used by the staff of the originating health centers.

Analysis and Use of Data

The peripheral health workers need only some simple analyses of the data to assist them in targeting and managing their primary health care programs. For the targeting and management of the nutrition activities, the questions for which they need information are:

(1) Who needs specific nutrition care and where are they located?

(2) How many of these known to be in need actually receive the nutrition care they need?

(3) Is the provision of health care services, of which nutrition is part, leading to improvements in the nutritional status of the community?*

To answer question 1, the health worker needs to have nutritional status information on all children in the village. In practice this is rarely achieved. To assist the health workers achieve this ultimate goal, they must have a census of the population they serve so that they can plan rallies or home visits to capture those who do not voluntarily attend the health clinic. From the records of the logbook and the census information, health workers can identify those who are not being reached by the health services. The number and proportion of children reached by the nutritional activities can be estimated by summarizing the logbook information in the report form shown in Figure IV-7. From this, estimates can be made on the extent of the coverage by growth monitoring activities, the proportion of children at risk who are being reached by the service (question 2) and the total number receiving other nutrition services, such as food rations. The overall effect of the health services on nutritional status can be estimated by the changes in prevalence (Figure IV-8) from month to month.

*Infants and pre-school children are the most vulnerable, therefore, the nutritional status of this group is usually used as a proxy for the community.

REPORT FORM

Monthly report for.....
(month)

Village/clinic.....District.....

Health worker.....Number of assistants.....

Total village population.....in.....families

1. Total children under 36 months
2. Total children under 36 months
with weight charts
3. Total newly entered this month
4. Total weighed this month
5. Total with no increase in
weight this month.
6. Total receiving food rations
this month
7. Total known to be at risk last
month not seen this month
8. Total at risk this month

Figure IV-7: Example of form to estimate coverage
(Design of form based on example developed
by J. Rohde and L. Hendrata for Indonesia (29)).

Village.....Filed by

Children weighed from.....to.....

age	Status of continuing participants				
	Normal	Grade I	Grade II	Grade III	Total
0-12					
13-24					
25-36					
37-48					
49-60					
Total					
New entrants					
0-12					
13-24					
25-36					
37-48					
49-60					
Total					
Drop-outs					
0-12					
13-24					
25-36					
37-48					
49-60					
Total					

Figure IV-8: Sample format for summary of nutritional status data. Adapted from Miller, R., and Sahn, D. (30).

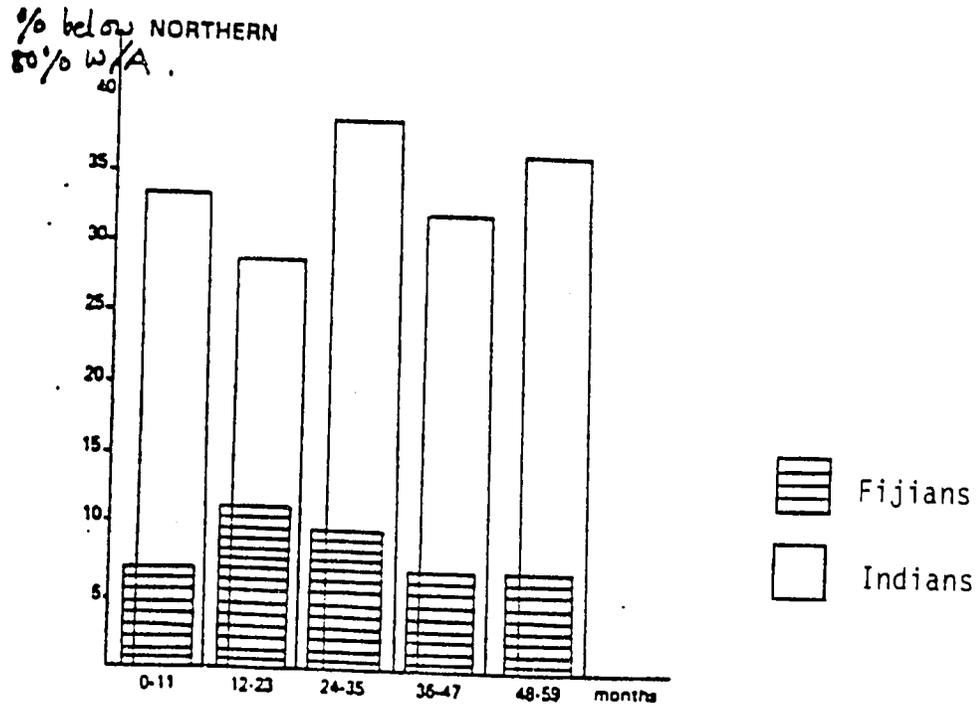
To obtain this information, additional columns would have to be added to the logbook form (Figure IV-6) to include the nutritional category that the child is in. The nutritional category can be obtained directly from the weight chart (Figure IV-5). To facilitate the health workers understanding of these data, they can be graphically presented in histograms and time series charts as shown in Figures IV-9 and IV-10.

Nutritional Surveillance At Other Levels

From the preceding section, we have shown how nutritional status surveillance can be developed on the basis of (i) a census that is updated periodically and (ii) growth monitoring activities. Once these two activities are firmly established at the peripheral level, the data generated from these activities can be simply transmitted to the district, regional and national levels in two forms (see Figure IV-11). These two basic forms are the census form and the logbook form. From these, data can be aggregated or disaggregated according to the way it will be used. At these levels, the main use of the data will be to support policy and planning decisions. More thorough and complex analyses, including the performance of appropriate statistical tests would need to be done. For more information on statistical analyses, the two references listed below are recommended:

- (1) Analytic Methods for Nutritional and Socio-economic Data by Hamid Tabatabai, Cornell Nutritional Surveillance Program Working Papers Series No. 4, April 1983. [32].

(a) Prevalence of Malnutrition by Ethnic Group, Fiji (31)



(b) Prevalence of Malnutrition by quarter (30)

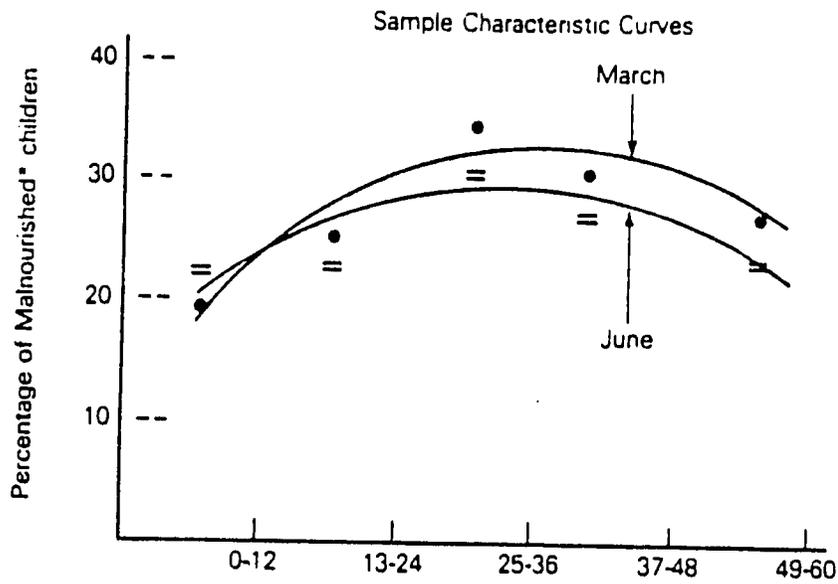


Figure IV-9: Examples of ways of presenting data graphically.

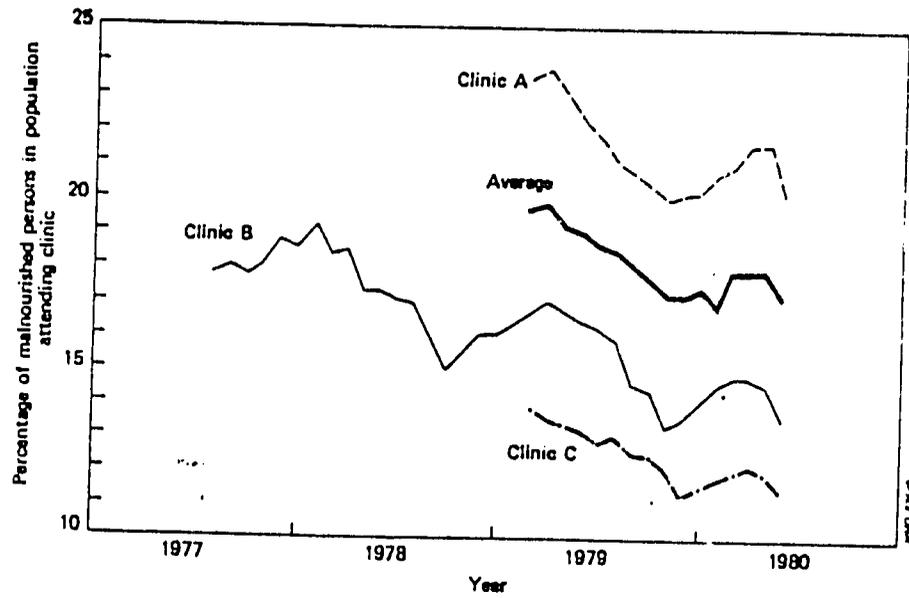


Figure IV-10: Example of output from monthly data collected in clinics - from Consultorios Sensores System in Santiago, Chile, 1977-1980 (6).

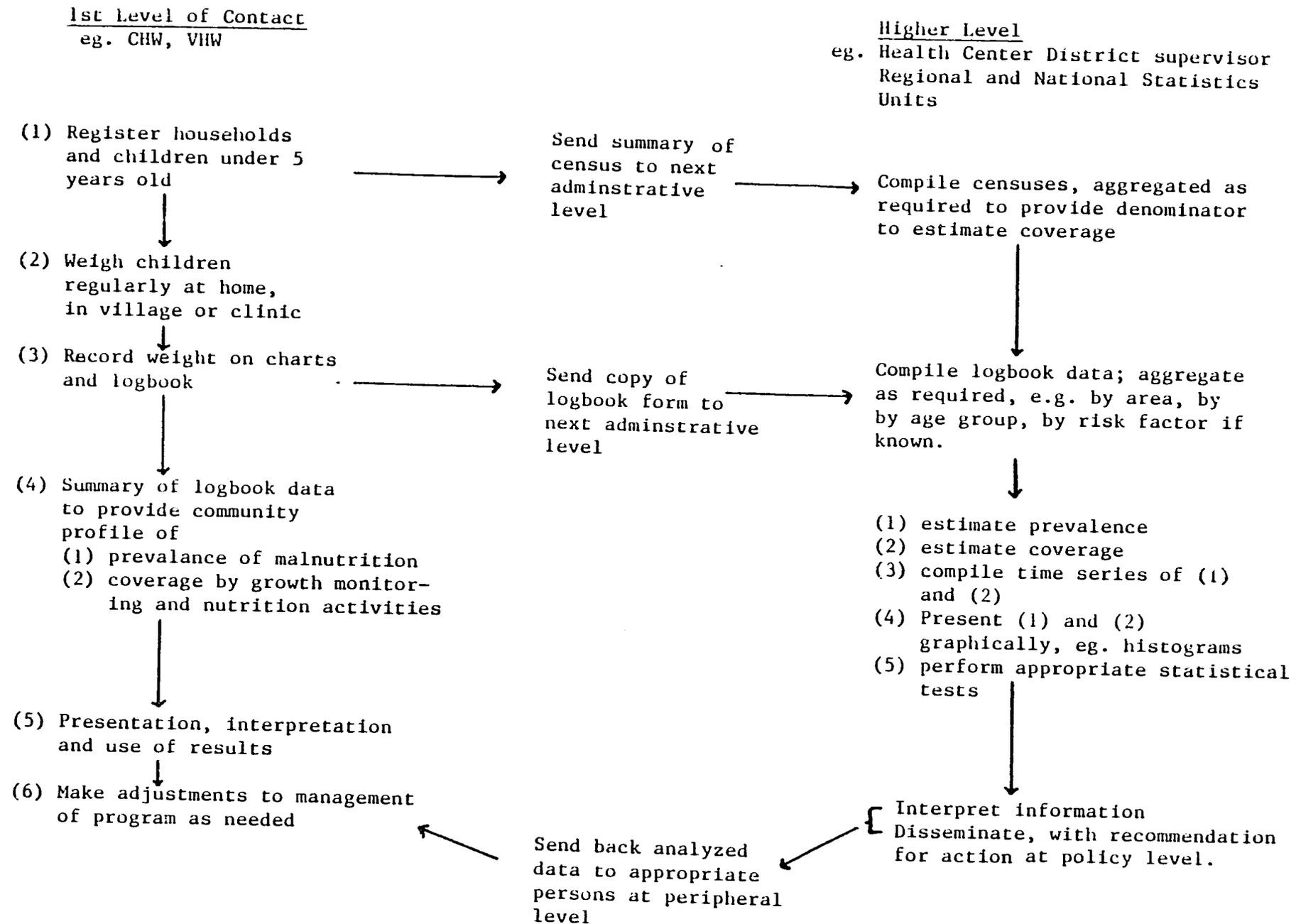


Figure IV-11: The Linkage of Nutritional Surveillance Activities Carried Out at Different Levels

(2) Applied Survey Methods for Development Projects, Training and Development Division, Office of Personnel Management, USAID, September 1981. [33].

Sample Surveys

An alternative way of generating data for nutritional surveillance is through sample surveys. India, Costa Rica, Kenya and the Philippines[34] are examples of countries that rely on surveys as a source of nutritional status data. This approach is most appropriate if the main purpose of nutritional surveillance is to provide data to support planning. If the surveys are carried out on a regular basis, they can also be useful for program evaluation. The approach used in Kenya is presented as an example of how sample surveys have been used successfully as a source of data for nutritional surveillance.

Since 1974, Kenya has conducted a series of sample surveys which integrate agricultural, nutritional, social and economic data[35]. The main purpose of these surveys is to provide data to support planning. Because of the wide range of data collected and the use of a common sampling frame for all surveys, data from different surveys can be merged thus allowing comprehensive analysis. The surveys are on-going; there is an established field organization with permanent staff and provincial offices. The current program consist of the following surveys:

- o Household Budget and Consumption
- o Nutritional
- o Crop Forecast

- o Social Indicators
- o Market Prices
- o Comprehensive Agricultural
- o Demographic
- o Employment,

All survey samples are drawn from a common frame which covers 65,000 households in rural areas and 15,000 households in urban areas. The wide range of data collected will permit a comprehensive analysis of the correlates of nutritional status and the policy implications of other sector activities on food production, consumption and nutritional status. The survey data will also be used to evaluate the nutritional impact of development and to identify target groups and to define the problems in likely to cause malnutrition and health problems in general.

Logistically, a nutritional surveillance system based on surveys will be easier to manage than one based on routine clinic data. This is because a core staff can be used to carry out the surveys thus facilitating training and supervision and ensuring that data can be accurately collected in a uniform way. Given adequate planning and resources, data can also be analyzed and disseminated quickly.

Ideally, the best approach would be to have a co-existence of a system based on routine data (e.g. growth monitoring) for the use of health workers in the field to enable them to manage their own programs and one based on surveys to provide data

needed for planning decisions. This way the two will serve to validate and complement each other.

CHAPTER V
ORGANIZATION AND MANAGEMENT

In any one area, several sources of data may exist. In the health sector, growth monitoring data are collected mainly through child welfare clinics and food supplementation programs which may be managed by the Ministry of Health or private voluntary organizations. When nutritional surveillance is based on growth monitoring data, it is necessary to ensure that uniform weight charts, record forms and weighing procedures are used. This is often an area of major conflict since implementing organizations usually have their own versions of a weight chart that they prefer. Every effort should be made to reach a compromise for a uniform chart and record forms as this will facilitate training and the merging of data from different sources.

The organization of nutritional surveillance involves the setting up of four related components:

- (a) Data Collection
- (b) Data Flow or transmission, including feedback of information
- (c) Data processing, analysis and interpretation.
- (d) Data use

In Figure IV-10, we showed that if the staff at the first level of contact is of the appropriate calibre, all four components can be carried out at this first level. However, in many countries staff at this level have minimal training, therefore

may not be able to carry out all these steps. At best, they may be able to collect the data only and pass it up for analysis. In any case, the health worker at the periphery plays a crucial role when nutritional surveillance is based on data routinely collected by this group of health workers. The support and supervision of this group is therefore critical since the quality of data depends on how accurately these health workers can collect data. The extent to which the peripheral health workers are involved in the analysis of data also depends on whether they are given the authority to analyze and use the data for decision making. An argument in favor of imparting these skills to the health workers in closest contact with the community is that it will enable them to be more responsible for the programs that they work in.

The managers of health and nutrition programs must understand the objectives of the program and how these will be met. To achieve the objectives, they need the support of the community and other health workers. To gain their support, these people should be involved in identifying and organizing resources needed to achieve the objectives set. Once the program is implemented, the manager and the community must also learn how to measure and control the use of resources[36]. One of the main uses of information derived from growth monitoring activities for project managers is to guide management. Managers need interpreted data to compare results with program objectives, previous results, costs and the population needs. If the project manager is not a trained

data analyst, he should either have a data analyst as a member of his support staff or have easy access to one so that he can use the data generated[37] to:

- o recognize bottlenecks, sudden rises in disease or problems,
- o determine whether services are being provided as planned,
- o determine whether the target clientele is using services,
- o determine whether services provided are making a difference.

Mechanisms for the transmission of both raw and analyzed data from one administrative level to another must be set up. At each level, there should be a person designated to be responsible for ensuring that raw data is transmitted for analysis and that analyzed data and reports are circulated to those responsible for decision making. For data to be useful to support decision making, they must be analyzed and made available to decision makers as soon as possible. The appropriate design of forms for data collection and summary and clear definitions of the type of analysis required will facilitate the process. Also, the use of microcomputers* when available, will also facilitate timely data analysis.

*Before making a decision to use these, users should make sure that there are local services for maintenance of hardware and user support for software is available.

At the national level, there is a need for a specific unit, such as a nutritional surveillance unit, that co-ordinates the operation of the above components. Such units are usually not in positions to collect data themselves. Their role is mainly to design data collection methods, train people in data collection and analysis, assist in data analysis and interpretation and in the presentation of results. There is a reasonable amount of experience in the collection of nutritional data and the processing of these periodically, either manually or by computer. There is, however, less experience in routinely processing nutritional data for the purpose of regularly preparing reports[6] and linking information to decision making. More operational research is needed on this.

The presence of a central co-ordinating unit is desirable as it can be responsible for ensuring that each of the above components are carried out satisfactorily and that each is linked to the other. Another responsibility of this unit will be to disseminate the information that is generated by nutritional surveillance systems. Such a unit should be sensitive to possibilities for disseminating the information as widely as possible[38]. This may be done through the publication of a regular bulletin or newsletter, as was done in Costa Rica[38]. The Costa Rica bulletin contains articles and discussions about the work of the nutritional surveillance project and displays of information produced. Stinson[37] identifies the following characteristics that

such bulletins should have if they are to be useful:

- o they should highlight the critical indicators
- o they should present material simply, using graphs wherever possible
- o results should be reported at an appropriate frequency
- o reports should be targeted for key decision makers

In addition to presenting the raw data, these reports should also present interpretations of the data. For this, the data analysts should work together with the users of information (e.g. project manager and supervisors) to produce the reports.

Nutritional surveillance is not an isolated activity. Instead, it is a specific activity that exists as part of a large organization. Co-ordination and collaboration between different agencies is therefore crucial, if nutritional surveillance is to serve its purpose. The key people involved in establishing these links are the supervisors at the field level and the coordinators of nutritional surveillance at the higher administrative levels.

Training

Training is a critical factor for the success of nutritional surveillance. This is important at all levels of the system. The field staff must be appropriately trained in data collection methods and in doing some simple, basic analysis. At higher levels, the staff responsible for co-ordinating nutritional surveillance and processing data must be trained in data analysis and interpretation, data management and the

dissemination and use of information. Since the reliability of the data generated from growth monitoring and nutritional surveillance activities depend on the ability of the field workers to collect accurate information, training of this group of workers is essential. Their supervisors must also be able to provide the support that is needed to make sure the activities can be carried out. These supervisors should be able to provide both administrative and technical support.

In the Gambia[39], the World Health Organization is working with the Nutrition Unit of the Ministry of Health to develop an apprenticeship approach to training community health workers in growth monitoring and nutritional surveillance. This approach is attractive because it is individualized and task oriented. So far, training has been carried out for the community health nurses who are directly involved in carrying out growth monitoring and data collection for nutritional surveillance, and the nutrition unit personnel whose responsibilities include the training of the community health nurses in nutritional surveillance and the co-ordination of the implementation of nutritional surveillance. Both training courses aimed to develop the health workers proficiency in the performance of specific tasks related to nutritional surveillance. Theoretical issues were kept to a minimum while real-life situations encountered in actual field visits provided the milieu for teaching. The practical sessions included instruction on the use of weighing scales and weight charts, the application of these

skills in practicals in selected villages where each trainee carried out exercises in data collection, counselling, analysis of data to obtain a community nutrition profile and the interpretation and of these results to assist in consultations with village development committees. A simulation of a rural health team meeting was also part of the training exercise. From the initial training lessons, the staff of the Nutrition Unit will develop and refine their own teaching materials so that they can extend training and provide support to those already trained in expanding activities to new areas.

Resources

The resources required for nutritional surveillance can be considerable, especially if it is proposed as a nationwide activity. The Cornell Nutritional Surveillance Program[6] reports that "experience shows that surveillance programs do take some time to become fully operational." They estimate that it takes at least 3-5 years for a program to become fully operational. They also suggest that "it is only worthwhile setting up a surveillance program when sufficient resources can be made available to hire or assign the minimum of five or so staff on a full-time basis." Staffing costs can amount to 50-70 percent of the budget for nutritional surveillance. The other major cost is for computer time for data analysis. Estimations of costs and outputs should be done in the initial assessment phase. The items which should be considered in the drawing up of the budget are shown in Table VI-1.

TABLE VI-1. PHYSICAL AND STAFF REQUIREMENTS AND TRAINING NEEDS FOR NUTRITIONAL SURVEILLANCE

	DATA COLLECTION	DATA FLOW OR TRANSMISSION	DATA PROCESSING, ANALYSIS AND INTERPRETATION	DATA USE
Physical requirements	<ul style="list-style-type: none"> ● Measuring equipment (scales, length boards) ● Forms, questionnaires, pens, boards ● Transportation (vehicle, fuel, maintenance) ● Duplication of filled out forms (xerox, if available) 	<ul style="list-style-type: none"> ● Postage/courier for transmissal of forms (raw data - data processing unit - analysed data returned to source and users). 	<ul style="list-style-type: none"> ● Forms, hand calculators ● Computers, computer software 	<ul style="list-style-type: none"> ● Publications for dissemination of results (preparation, editing, printing, postage/delivery).
Staff requirements	<ul style="list-style-type: none"> ● "Enumerators." Use existing staff wherever possible ● Person responsible for collating data for clinic/village. ● Person responsible for supervision and co-ordination with other components of system. ● Trainers in data collection 	<ul style="list-style-type: none"> ● Person responsible for sending raw data to ● Person responsible for receiving and disseminating analysed data. 	<ul style="list-style-type: none"> ● Staff for: data checking, data entry, data interpretation, data dissemination ● Supervisor/co-ordinator ● Trainers in data analysis and management 	<ul style="list-style-type: none"> ● Person responsible for receiving and disseminating information to users. ● Identified users in various sector/organizations who will use information.
Training needed	<p><u>"Enumerators"</u></p> <ul style="list-style-type: none"> ● Taking measures ● Recording data ● Interpreting data (for individuals and responding to identified needs) ● Filling in forms (log-book, summary forms) <p><u>Supervisors</u></p> <ul style="list-style-type: none"> ● All of above, plus ● Staff and resource management 		<ul style="list-style-type: none"> ● Use of computer/hand calculator ● Coding, data entry into computer ● Statistical methods ● Interpretation of results ● Presentation of results ● Data management ● System Management 	<ul style="list-style-type: none"> ● Users' interpretation of results.

When estimating staff requirements, the additional work that nutritional surveillance activities place on existing work schedules need to be identified. Although it is suggested that data can be routinely collected using existing institutions, care needs to be taken to avoid placing excessive demands on the field level staff when asking them to be responsible for data collection. If nutritional surveillance is deemed to be essential but the existing field staff is already fully taxed, consideration should be given to recruiting additional staff for nutritional surveillance.

REFERENCES

- (1) World Health Organization. "Analysis of the Content of the Eight Elements of Primary Health Care," Geneva 1981.
- (2) Development of Indicators for Monitoring Progress Towards Health for All by the Year 2000. Health for All series No. 4. WHO, Geneva. 1981.
- (3) Nutrition in Primary Health Care: Summary of an International Conference. Oelgeschlager, Gunn & Hain, Publishers, Inc. Boston, 1984.
- (4) Morley, D., J. Rohde, and A. Williams (editors). Practicing Health for All. Oxford University Press, 1983.
- (5) Workshop Preceedings, Growth Monitoring As a Primary Health Care Activity. Yogyakarta, Indonesia 20-24 August, 1984. Sponsored by the Ford Foundation for Indonesian Welfare (415) and The Ford Foundation. January 1985.
- (6) Mason, J.B., J.P. Habicht, H. Tabatabai, and V. Valverde. Nutritional Surveillance. World Health Organization, Geneva 1984.
- (7) Habicht, J.P., M.J. Lane, and A.J. McDowell. "National Nutrition Surveillance." *Federation Proc.* 37:1181. 1978
- (8) Approach for Maternal and Child Health Care. WHO Offset Publication No. 39. Geneva 1978.
- (9) Montoya-Aguilar. "The Use of Epidemiology by Front Line Health Workers in Developing Countries." WHO/SHS/SPM/81-3. 1981

- (10) World Health Organization. Final Workshop on Systems for Monitoring and Predicting Community Nutritional Status. Manila, April 1978.
- (11) Daza, C.H. and M.S. Read. "Health Related Components of a Nutritional Surveillance System." Bullentin of the Pan American Health Organization 14(14):327-336, 1980.
- (12) World Health Organization. Organization of Primary Health Care in Communities. SHS/IAH/84.1.
- (13) Habicht, J.P. "Some Characteristics of Indicators of Nutritional Status for Use in Screening and Surveillance." Am. J. Clin. Nutr., 33:1241-1254, May 1982.
- (14) World Health Organization. Managerial Process for National Health and Development. Geneva 1981.
- (15) Deboeck, G., and Kinsey, B. Managing Information for Rural Development Lessons from Eastern Africa. World Bank Staff Working Paper no. 379. March 1980.
- (16) De Sweemer, C., F.L. Trowbridge, R.L. Parker, D. Meriwether, K.H. Brown, R.E. Black, W.A. Reinke, and C.E. Taylor. "Critical Factors in Obtaining Data Relevant to Human Programs." In Methodologies for Human Population Studies in Nutrition Related to Health.
- (17) Reinke, W.A. Decision making and evaluation, In Stinson, (Reference 37).
- (18) Teller, C.H. "Jamaica Trip Report." January 30-February 22, 1983. LTS, Corporation (mimeo).

- (19) Trowbridge, F.L. and C.H. Stetler. "Nutritional Status Surveillance in El Salvador." Bulletin of the World Health Organization 58(2):327-332 (1980).
- (20) Maribe, T.O. "Update of Nutrition Surveillance in Botswana." In Report of Workshop Social and Nutritional Surveillance in Eastern and Southern Africa, Nairobi, Kenya, 17-19 May 1982. UNICEF and Cornell Nutritional Surveillance Program, Ithaca, NY.,
- (21) Griffiths, M. Growth Monitoring. Primary Health Care Issues Series I, No. 3. American Public Health Association, 1981.
- (22) Wilcox, J., C. Teller, and J.A. Aguilar. "Guidelines for Incorporating Nutrition into the Design of Primary Health Care and Related Development projects. Report #10. USDHSS/OIH, May 1983.
- (23) World Health Organization. A Growth Chart for International Use in Maternal and Child Care. WHO, Geneva, 1978.
- (24) Guidelines for Training Community Health Workers in Nutrition. WHO Offset Publication No. 59, Geneva, 1981.
- (25) USAID-Bureau for Asia. Recommendations for Improved HPN Program Implementation within the Bureau for Asia. Report Prepared at the Asia Bureau Health, Population and Nutrition Officers Conference, May 21-15, 1984, Singapore.

- (34) Cornell Nutritional Surveillance Program. Recent advances in nutritional surveillance: A review of Kenya's Experience and Policy Implications. Paper presented at National Workshop on Nutrition and Planning in Kenya, Kisumu, Kenya. January 1984.
- (35) Kekovole J., Omoro, F., Wasonga, L. National surveillance in Kenya. Paper presented at workshop on Social and Nutritional Surveillance in Eastern and Southern Africa, Nairobi, Kenya 17-19 May 1982. Co-sponsored by UNICEF and Cornell Nutritional Surveillance Program.
- (36) Morley D. Paediatric Priorities in the Developing World. Butterworths, London, 1976.
- (37) Stinson, W., "Information Systems". Primary Health Care Issues Series no. 6. American Public Health Association. January 1983.
- (38) Excerpt from Report on International Workshop on Nutritional Surveillance, Cali, Colombia. 14-17 July 1981. Prepared by ACC-SCN.
- (39) Gabbidon, H., Phall, M., Sumura, B., Taal, O., Taylor, N., and Kreysler, J. Training for Nutritional Surveillance through Primary Health Care in the Gambia. Report on a Mission to the Gambia, August/September 1984.

- (26) Morley, D. and M. Woodland. See How They Grow.
Macmillian Tropical Community Health Manuals, 1979.
- (27) Tremlett, G., Lovel, H., and Morley, D. Guidelines
for the design of national weight-for-age growth charts.
In: Assignment Children, vol. 61/62, p. 143-175, 1983.
- (28) UNICEF. "Report on the Evaluation of Botswana's
Nutritional Surveillance System." UNICEF Social
Statistics Programme. Occasional Papers No. 4.
Nairobi, 1983.
- (29) Rohde J. and Hendrata L. Development from below: trans-
formation from village-based nutrition projects to a
national family nutrition programme in Indonesia. In:
Practicing Health for All (Ref.4).
- (30) Miller, R., and Sahn, D. Built-in evaluation systems
for supplementary feeding programmes - why and how. In:
"Methods for the Evaluation of the Impact of Food and
Nutrition Programmes" edited by Sahn, D., Lockwood, R.,
and Scrimshaw, N.S. United Nations University, 1984.
- (31) Lambert J. and V. Yee. "National Nutrition Survey.
Fiji Medical Journal, May 1981.
- (32) Tabatai, H., Analytic Methods for Nutritional and Socio-
economic Data. Cornell Nutritional Surveillance Program
Working Paper Series no. 4, April 1983.
- (33) USAID, Applied Survey Methods for Development Projects.
Training and Development Division, Office of Personnel
Management, USAID. September 1981.

APPENDIX A

MEASURING TOOLS AND DATA RECORDING INSTRUMENTS

All figures and tables presented in Appendix A are reproduced from:

GROWTH MONITORING
by Marcia Griffiths
Primary Health Care Issues Series No. 3.
American Public Health Association, 1983.

Table 1: Assessment of Measuring Tools.

	Accuracy/ standardization	Ease of use	Taring	Sturdiness/ durability	Ease of repair	Readability	Non-threatening appearance	Portability	Cost (US\$)
Arm circum- ference tape	Subject to observer er- ror. Pulling tape too tight	Use of strip easy but often difficult to take mid- arm measure	N.A.	2	3	3	3	3	Very reason- able
Locally man- ufactured scales	Scale may not be as ac- curate as commercially manu- factured scales; main- tenance may be a problem	Depends on construction, but after training not difficult	Usually no mechanism	2	3	2	2	2	Reasonable
Single beam "clinic" scales	Accurate and can be standardized	After training not difficult	Yes	3 (if stationary)	2	3	3	1	50-100
Single beam—free hanging scales	Accurate and can be standardized	After training not difficult	May not have taring screw	3	3 (if local) 2 (if imported)	3	2	3 Depends on weight	20-30
Dial spring scales	Accurate and can be standardized	After training not difficult	Yes	3	2	3 (although a problem with swinging needle)	2	3	40-50
Tubular spring scales	May lose ac- curacy quickly	After training not difficult	Yes	2	2	2	2	3	11-37
Length/ height boards	Should be accurate and easy to standardize	After training not difficult, but needs two people for accurate measure	N.A.	3	3	3	3	2 Depends on weight	Can be lo- cally manu- factured or purchased 7-50
Weight/ height chart	As accurate as scale and method of taking height	After training not difficult, but needs two people for accurate measure	N.A.	2	Need to or- der new chart or re- draw old chart	3	3 Scale may be problem	3	Chart and scale, 50-60

Key: 3-excellent 2-mediocre 1-poor N.A.-not applicable

Figure 1: Thinness Chart for Measuring Weight-for-height.

**Health Worker and Mother Measuring
Child on Thinness Chart** Source: London School
of Hygiene and Tropical Medicine, London, U.K.

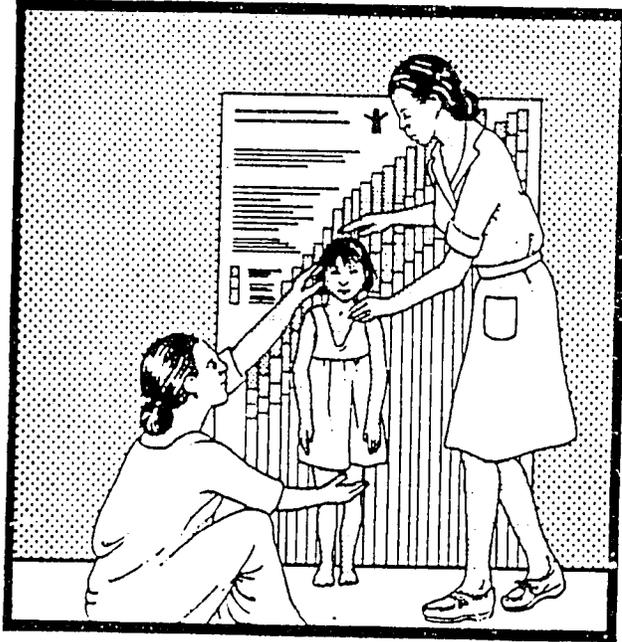


Figure 2: Arm Circumference Tape.

Example of the "Insertion" Tape Source: A. Zerfas (138)

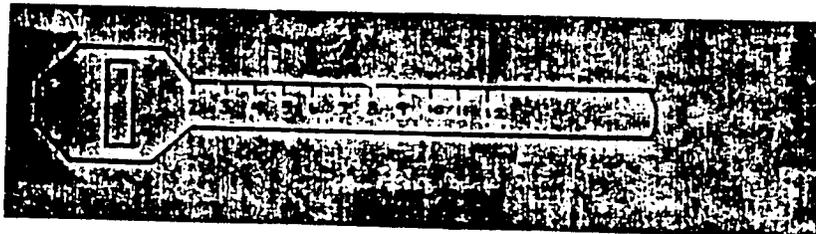


Figure 3: Individual Weight-for-age chart.

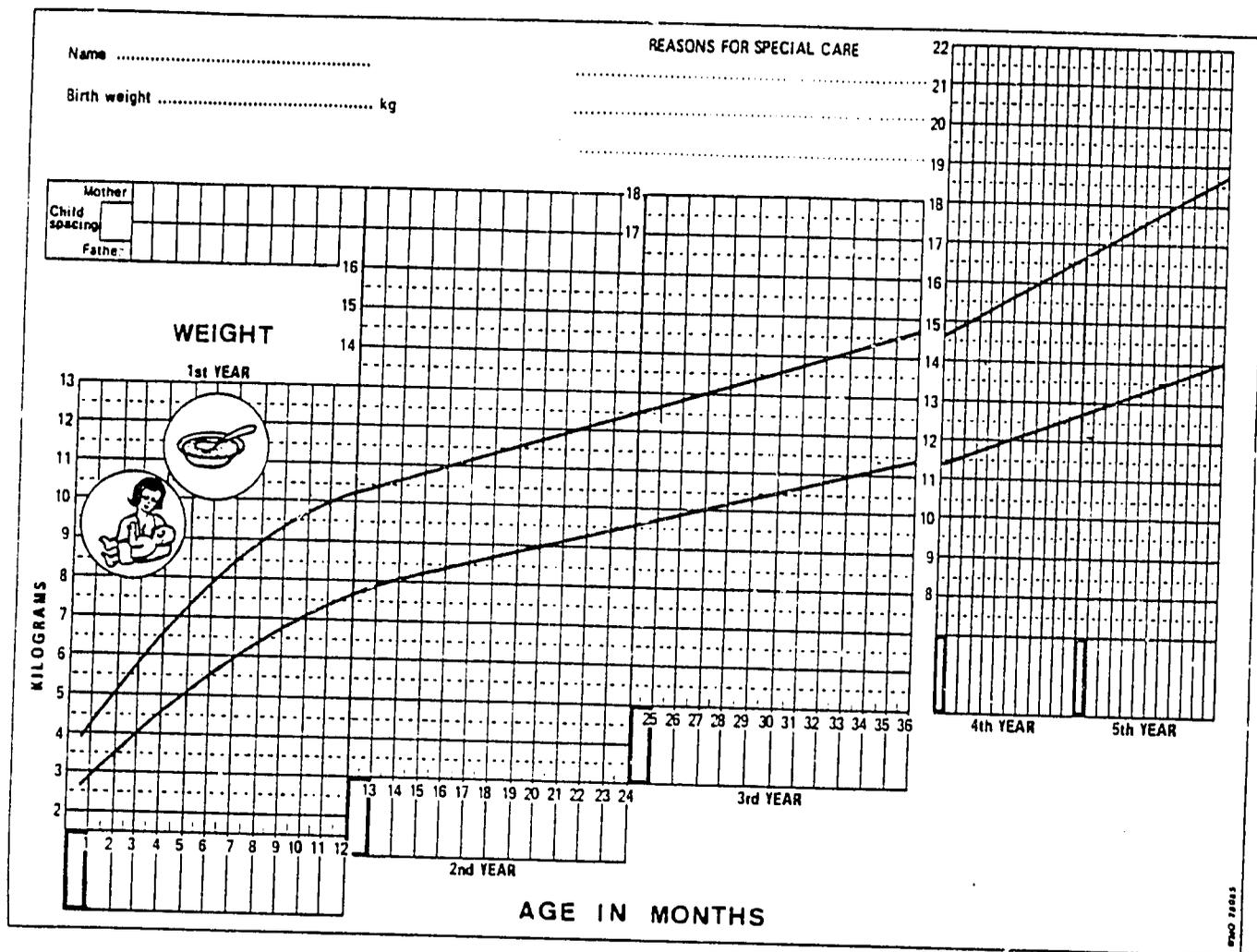
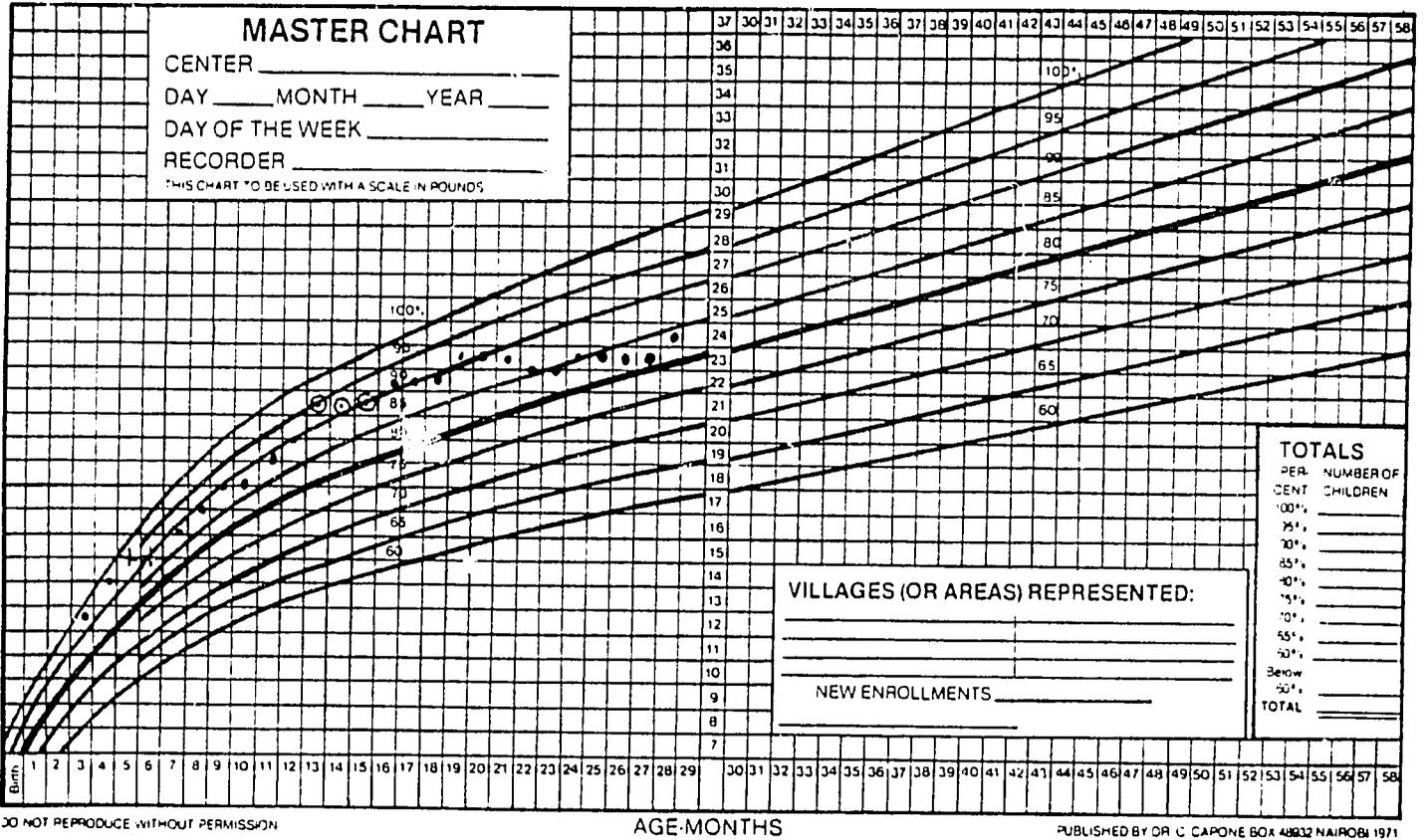


Figure 4: Community Weight-for-age chart.



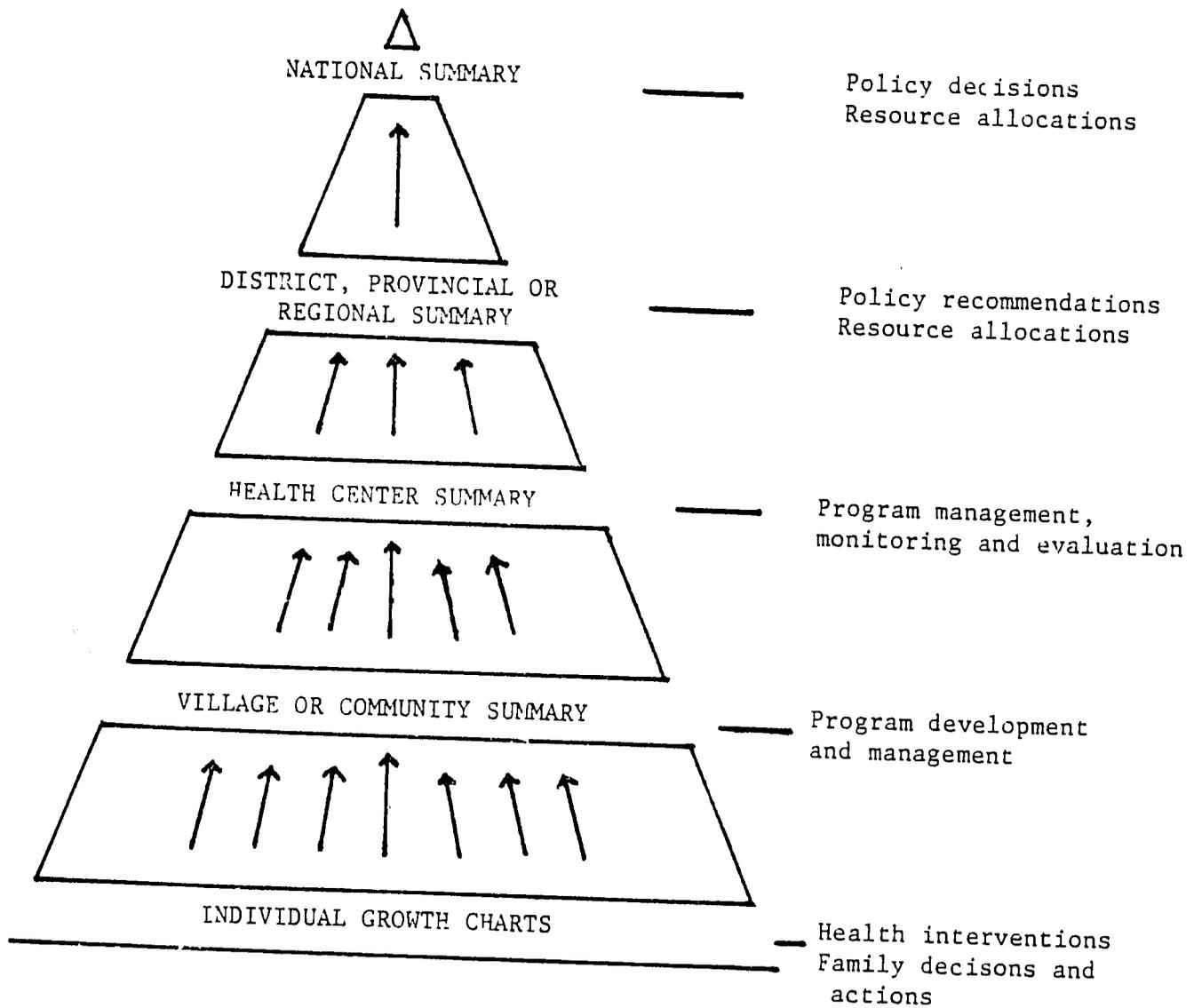


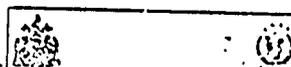
Figure IV-1: Illustration of how growth monitoring data can provide the basis for nutritional surveillance and the types of decisions that can be supported by the data generated at each level.

Figure 5: Weight-for-height record card for Thinness Chart.

		AGE (months)		NUTRITION CARD												Number															
Weight for height percent	60																		Child's name	Dark Red	.....									
	70																			Sex	male <input type="checkbox"/> female <input type="checkbox"/>										
	80																			Mother	.....									
	90																			Father	.....									
	100																			Address	.....									
	110																			Health clinic	.....									
	MONTH	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May		June	July	August	September	October	November	December	YEAR	Date of Registration	<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 6: Arm Circumference Record Card.

Arm Survey Record (Nepal) Source: Ministry of Health or UNICEF, Kathmandu, Nepal

पाखुरा नापी रिकर्ड राख्ने ARM SURVEY RECORD				
→	Healthy			बच्चाको नाम
→	Extremely urgent To feed nourishing food			Child Identification
→	Medicine			बच्चाको नाम
→				पञ्चायत
→				राष्ट्रियो बन्दी नावको उमेर
→				लिंग <input type="checkbox"/> बन्दी <input type="checkbox"/>
→				मिति <input type="text"/>
→				दिन <input type="text"/> महिना <input type="text"/> वर्ष <input type="text"/>
→				

APPENDIX B

THE BOTSWANA NUTRITIONAL SURVEILLANCE SYSTEM

The information presented has been abstracted from: Report on the Evaluation of Botswana's nutritional surveillance system, July 1983. UNICEF Social and Statistics Program, Eastern Africa Regional Office. Occasional Papers No. 4. T988.

Since its implementation on a national level in January 1978, Botswana's nutritional surveillance system has been providing on a monthly basis clinic-based data on the nutritional status of pre-school children. A major purpose of a nutritional surveillance system is to provide useful information to individuals at various administrative levels, from health facility to national, which would help them to make decisions to improve the nutritional status of the population. This would include, for example, using the information in planning programs and making policy, in evaluating the impact of development projects and in initiating interventions in emergencies such as drought.

Overview of the Nutritional Surveillance System

Each month over 3000 health facilities around Botswana send information on the nutritional status of the pre-school children attending their Child Welfare Clinic (CWC's) to the Central Statistics Office (CSO) in Gaborone. The CSO compiles this data and produces a monthly Nutritional Surveillance Report which gives a national, regional as well as an individual health facility breakdown of the prevalence figures for children nutritionally at-risk (e.g. less than 80% weight-for-age of the Harvard reference population's mean). The CSO receives this data monthly from the health facilities in the form of a Master Clinic Chart (see Figure B-1) which should have plotted on it all the weigh-for-age (WA) values for each child attending the CWC. In addition to presenting the prevalence of at-risk figures at a national, regional and health facility level, the CSO also aggregates these figures into an ecozone classification whereby one can distinguish the prevalence figures of urban areas from rural areas, big villages from small villages, cattle posts from land areas and so on.

A recent evaluation of the existing system found that: the present system of data collection and reporting which uses the Master Clinic Weight-for-Age Chart is not only a tedious and time-consuming procedure but is also very error prone. Mistakes in plotting each child's weight and age onto the Master Clinic Chart as well as mistakes in counting the numbers of children plotted on the chart can dramatically effect the prevalence of figures especially if the number of children is small. In addition, a large number of health facilities are not reporting

FIGURE B-1
EXAMPLE OF MASTER CLINIC CHART

Nutrition Surveillance for the Month of _____

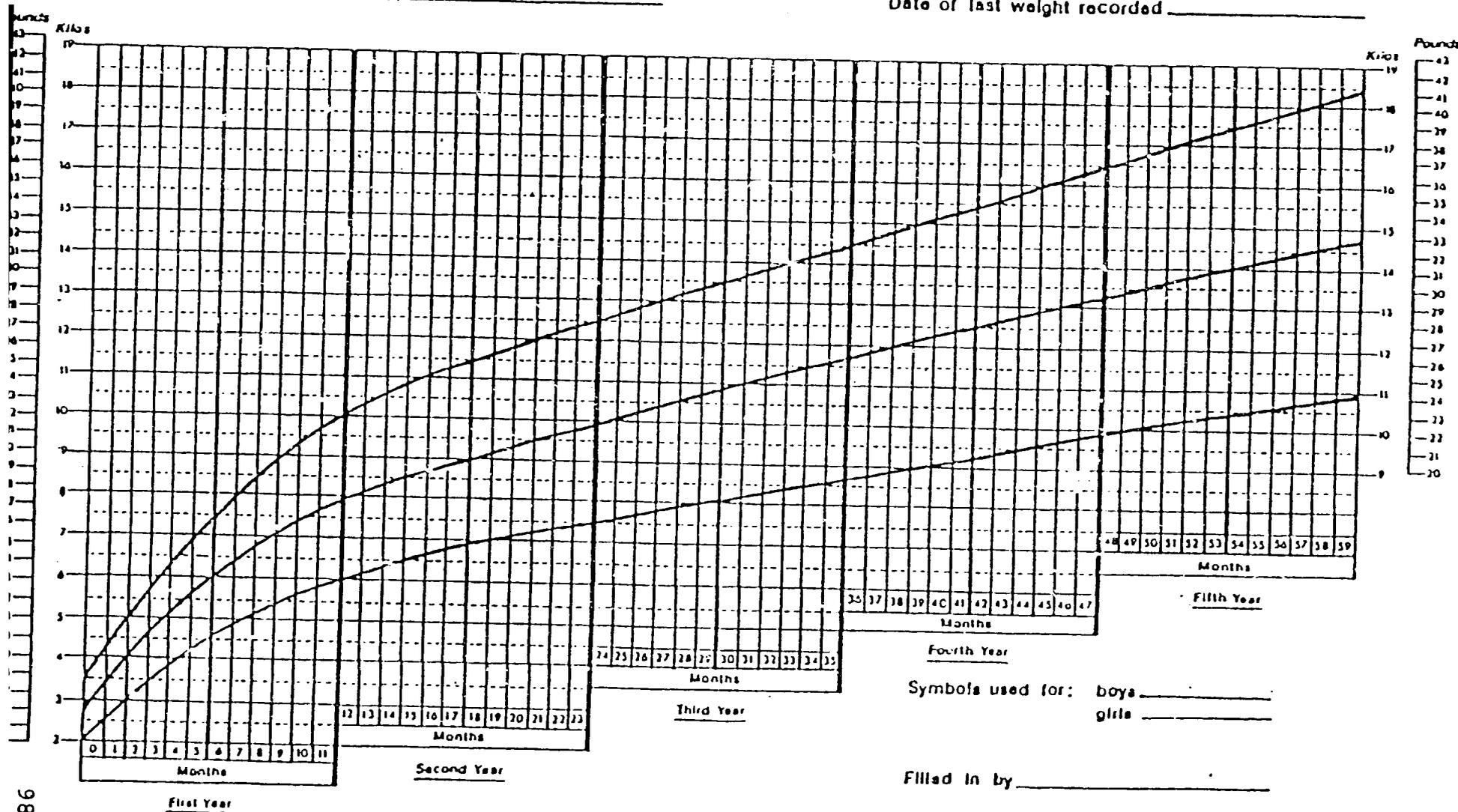
MI 1019

Name of Clinic/Health Post _____

Health Region _____

Date of first weight recorded _____

Date of last weight recorded _____



When completed, please return to: CENTRAL STATISTICS OFFICE,
PRIVATE BAG 0038, GABORONE by the 13th of the following month.

FIGURE B-2

Example of a Page in the Proposed CWC Nutrition Logbook

Page

MONTH OF

Name of Clinic/Health Post/Mobile Stop:

Health Region:

Date of First Weight Recorded: Date of Last Weight Recorded:

Completed by:

CHILD'S NAME	Sex 1=M 2=F	BIRTHDAY		Weight (Kg)	At Risk (✓)	No Weight Gain (✓)	Food Rations (✓)	MOTHER'S EDUCATION		
		Month	Year					None	Some Primary	Some Secondary
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
⋮										
24										
25										
TOTAL (Add up tally-marks)										

their monthly nutritional surveillance data and consequently the national coverage figure is only 48% for the entire pre-school population in Botswana. The problematic nature of the present data collection and reporting system is probably a major factor which has caused health facilities to default on reporting.

Among the recommendations were the following:

- o The present system of using the Master Clinic Chart to report the nutrition data should be discontinued since it introduces too many errors into the data which could greatly distort the prevalence figures.
- o It is recommended that CWC Nutrition Logbook (see Figure B-2) be used in the health facilities to record the sex, birthdate, weight and growth status of each child attending the CWC as well as the nutritional risk status.
- o Other information which should be noted in the CWC Nutrition Logbook includes recording the mother's education level since a strong relationship was found between the mother's education status and the child's nutritional status. This information should be useful in monitoring the characteristics of the CWC population as well as interpreting the nutritional surveillance data. This will necessitate recording the mother's education level on the children's Road-to-Health growth cards. In addition, those children who have received food rations during the previous month should be noted in the CWC Nutrition Logbook since this information would be useful in monitoring and evaluating food relief programs.