



AN INTER-AGENCY INITIATIVE TO PROMOTE INFORMATION
AND MAPPING SYSTEMS ON FOOD INSECURITY AND VULNERABILITY



Summary of Proceedings

MEASUREMENT AND ASSESSMENT OF FOOD DEPRIVATION AND UNDERNUTRITION

International Scientific Symposium
Rome, 26–28 June 2002



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Rome, 26-28 June 2002

Symposium convened by the Agriculture
and Economic Development Analysis Division

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2002

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Preface

The idea of holding the Scientific Symposium on Measurement and Assessment of Food Deprivation and Undernutrition had its origins after the World Food Summit of 1996. It was felt that bringing together those who deal scientifically with methods and applications of those methods for the measurement of hunger would greatly enhance FAO's mandate to measure and monitor progress towards the goal of halving the number of hungry by the year 2015. We are grateful for the support of the Government of The Netherlands through the FAO-Netherlands Partnership Programme that made possible the gathering of experts from many parts of the world to discuss with us this extremely important issue.

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Part I

INTRODUCTION

Opening Address

Hartwig de Haen

Assistant Director-General, Economic and Social Department (ES)

Food and Agriculture Organization of the United Nations (FAO)

Rome, Italy

Friends, colleagues, ladies and gentlemen, all of you are most welcome to this Scientific Symposium on Measurement and Assessment of Food Deprivation and Undernutrition held at FAO headquarters. I would like to say at the outset that measurement and monitoring of what happens in the world is one of the fundamental mandates of the United Nations. The responsibility of FAO is, of course, to monitor food and agriculture at the global level, but the promotion of these activities at country and subnational levels is equally important. Such monitoring and measurement applied to the problem of food insecurity or more specifically, food deprivation and undernutrition, serve the noble objective of counting and identifying those who are chronically or temporarily undernourished, malnourished, food insecure or vulnerable. In doing so we are actively contributing to the realization of a basic human right: the right to food. Knowledge by decision-makers of where the food insecure, vulnerable, and under- or malnourished persons are is an essential precondition for targeted and effective action. Therefore, it is our duty to mobilize effort and resources and to bring science and experience to bear towards this endeavour. In the World Food Summit: five years later, which was just concluded, it was shown that progress in the reduction of the number of undernourished has been too slow to meet the goal of halving hunger by 2015 and that more action is to be taken at the global, regional and country levels.

Action on the part of governments or other responsible policy-makers will be supported by the use of all available avenues to determine why people are hungry, who they are and where they live. Appropriate information is a tool for those governments that have the political will to fight hunger and malnutrition. It can also be a very powerful tool for mobilizing the necessary political will. I hope, therefore, that this Symposium, in addition to the technical task of discussing the various measurement methods, will also serve a very political purpose – to draw attention to the need for greater action in fighting hunger and malnutrition.

As you are aware, FAO has conducted monitoring of undernourishment over many years as part of its mandate, but this effort acquired particular importance after the 1996 World Food Summit (WFS) established the target of halving the number of undernourished by the year 2015. Halving of hunger has also become an important part of the Millennium Development Goals (MDGs). There is therefore a clear and internationally accepted mandate to reduce the number of hungry substantially and sustainably, which makes the monitoring of progress in hunger reduction at the global and national level an even more important part of our mandate. The World Food Summit determined the target at the global level, but what we have seen is that most, if not all, of the progress in reducing the number of undernourished, as measured by the FAO indicator, is mainly due to achievements in a few countries, in particular, China. Using the same FAO indicator, many developing countries have seen an increase in the number of hungry or undernourished in the 1990s. Therefore, unless each and every country adopts the same target – an outcome that is undoubtedly in the spirit of those who adopted the Rome Declaration at the World Food Summit – we may see a widening gap between successful and unsuccessful countries in the world.

It has always been my opinion that we cannot have only one indicator of hunger, even if we wish to measure only one aspect of it. In reality, we want to measure a variety of aspects including food availability, food intake, nutritional status and accompanying factors that determine these different states, hence the need for using different indicators.

I cannot anticipate what the outcome of this discussion will be, but I would hope that you will all contribute to improving the currently used methods as well as suggesting others. In preparing this meeting, we thought of structuring it along the lines of the well-established indicators, especially the one that FAO is using and to which so much reference is made in the world. As you know, it is an indirect indicator, not taken from observations of people's food intake, and therefore has always been subject to diverse opinions – some believe we overestimate while others believe we underestimate the prevalence of hunger. It is surprising how few countries have challenged our estimates since we began publishing them for individual countries in 1996. A few have criticized the FAO estimate but most refer to the one that FAO provides for them, even though it

was not meant to be the only indicator available for individual countries. Unfortunately, many countries have not yet begun to measure their food deprivation and undernutrition or to publish those data. But that is the task of the Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) initiative, and I am glad to note that many who are involved in the Interagency Working Group on FIVIMS are also here. There is as much donor interest as country interest in this and we are encouraged by the fact that so many developing countries have launched projects to establish information systems and to obtain data of their own to be used for better and targeted policies. Methods and the choice of indicators will be an essential dimension of your discussion and I believe we have every possibility to come up with recommendations that will be useful to all those who are concerned with and work on issues related to hunger in the world and to those who actively fight to reduce it.

The Symposium is organized around three main themes. On the first day we will hear from keynote speakers on the various methods in use to measure undernourishment, undernutrition and malnutrition, followed in the afternoon by discussion sessions for each method. Our first keynote speaker, Loganaden Naiken, formerly Chief of the Statistical Analysis Service here at FAO, will present the FAO measure of dietary energy supply. He will be followed by Lisa Smith of the International Food Policy Research Institute who will discuss the use of household income and expenditures surveys, Anna Ferro-Luzzi of the Italian Nutrition Institute, on individual food intake surveys, Prakash Shetty of the Nutrition Division at FAO, on anthropometric surveys, and Eileen Kennedy of the International Life Sciences Institute, who will discuss the use of qualitative methods to measure hunger. A synthesis of these methods and possibilities for their combined use will be provided by John Mason, Professor at Tulane University. On the second day we will hear contributed papers by 24 researchers who have developed and/or used measurement methods in the field. The final day will be dedicated to organizations that use hunger data for implementation of programmes and interventions, followed by a final discussion, involving everyone, about all that we have heard and directions for the future.

Welcome again to this Symposium and I wish you a very successful three days of work.

Part II

METHODS: DESCRIPTION AND DISCUSSION

KEYNOTE PAPER ABSTRACT

**FAO Methodology for Estimating
the Prevalence of Undernourishment**

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This paper gives a broad account of the methodology and data used by FAO for estimating the prevalence of undernourishment. Following a short introduction, the basic methodological framework is reviewed, which consists of a frequency distribution of food consumption (expressed in terms of dietary energy) and a cutoff point for intake inadequacy defined on the basis of minimum energy requirement norms. Subsequently, the data and procedures used for estimating the frequency distribution of food consumption and the cutoff point are described. The meaning and significance of the FAO measure of food deprivation in the light of the limitations placed by the data and procedures used are then explored. A section is devoted to a brief description of similar measures produced by other organizations or authors and their relationship with the FAO measure. The strengths and weaknesses of the FAO estimates, the feasibility of their improvement in the future and issues relating to the feasibility of disaggregating the estimates by sex-age or subnational groups are also discussed. The paper includes four technical appendices. Three of these deal with certain issues raised in the paper, in particular the role of the bivariate probability distribution and the expectation of a correlation between energy intake and requirement in justifying the methodology for estimating the prevalence of undernourishment. The fourth appendix illustrates the application of the FAO methodology in a hypothetical country.

DISCUSSION GROUP REPORT

FAO Methodology

Chair: *Shala Shapouri*

Discussion openers: *Isidoro David and Benjamin Senauer*

Rapporteur: *Sumiter Broca*

There was a lively discussion centred around the strengths and weaknesses of the FAO method and other themes introduced by the discussion openers. It was stated that the FAO method has some strengths, in particular the fact that these estimates can serve as a benchmark for evaluating the global picture. These estimates are consistent and thus can be used to identify long-term trends in undernourishment (“Is the number of hungry people declining?”).

However, there are also problems, starting with serious inaccuracies in the underlying food balance sheet data arising from flawed production data – for example, Chinese food and fish production data – and flawed trade data in countries with relaxed borders. Another problem raised by the speakers is that the FAO method may overstate prevalence of undernourishment in some regions and understate it in others, perhaps because it places too much stress on mean energy consumption and not enough on energy distribution. The fact that the method considers only energy intakes and not micronutrient intakes may also be a problem.

The examples of Thailand and Indonesia were given to show that the FAO approach produces numbers that do not tally with other socio-economic indicators.

Suggestions for improvements to the FAO method

Improving the quality of the underlying data

The example of the US poverty estimates was given to argue that data on poverty and undernourishment are inherently political. The archaic methodology used to derive the US poverty figures is still in use because changing it would be politically difficult. The same argument applies, *mutatis mutandis*, to the FAO method. “Tinkering at the edges” is all that is possible.

As Naiken’s simulations have shown that the FAO estimates are insensitive to the distribution parameter for means close to the cutoff but are sensitive to the choice of cutoff point and the mean, efforts should focus on improving the accuracy of these figures. It was argued that the focus on individuals’ needs in deriving cutoffs was unnecessarily complicated and could be replaced by sex- and age-specific figures without sacrificing accuracy. The assumption that the requirement and intake are correlated also calls for closer examination.

Arguments were made to show that reporting on undernourishment annually was not justified because the underlying situation changed little from year to year and also because the signal-to-noise ratio was low.

Promoting compatibility with other data

It is undesirable that figures on conceptually similar concepts such as poverty and undernourishment should give conflicting signals. It is therefore necessary to build partnerships between international agencies and countries to promote comparability and also to ensure sustainability of these indicators.

Using household survey data

It was pointed out that for the purpose of determining the proportion of the population in poverty, a large number of countries use household survey data to calculate the proportion of households suffering from inadequate energy intakes. Hence, FAO should make use of these data to cross-check and improve its food

balance sheet-derived estimates of the proportion of undernourished. However, the wholesale replacement of the FAO method was not advocated.

Two objections that had been raised in the keynote paper to the use of household survey data were questioned. These were: (1) that sampling procedures were designed to give accurate estimates of means and not proportions below a cutoff point; and (2) that the complex sampling designs that underlie these surveys were not taken into account in making inferences about population parameters from sample statistics. It was argued that these objections were invalid because a large number of countries were, in fact, making use of survey data to measure inequality and poverty. Software is now available that takes into account complex sampling designs in making inferences about population parameters.

However, it was conceded that replacing the FAO estimates with estimates derived from household survey data would be expensive and not always feasible, and that these data suffered from problems of their own. Examples were given from India, based on the long-running National Sample Survey, to show how problems could arise. For example, changing the recall period from 7 to 30 days significantly changes the proportion of the population in poverty. Accurate measures of the distribution of food consumption across income groups are not possible as the sampling design is aimed at yielding accurate estimates of average food consumption at the expense of accuracy in estimating the distribution.

Using anthropometric data

It was suggested that the FAO estimates could be supplemented with anthropometric data for children and also body mass index (BMI) for women. There is a critical need to gather more data on adult anthropometry. Another advantage of this would be that the increasing incidence of obesity in developing countries could be better measured and studied.

Discussion

In the ensuing discussion, these points were endorsed, added to or corrected. First, on the weaknesses of FAO data, it was argued that no method could be guaranteed to work for every country. Statistical analysis has shown that the FAO measure is closely correlated on average across countries with other variables related to food security. This fact was exploited to construct an aggregate household food security index that was later found useful by World Food Programme (WFP) in targeting food aid to individual countries. This point was endorsed by two other participants, one of whom stated that he had found links between anthropometric data, in particular, and data from food balance sheets. There was also the question of what to expect when comparing data on food availability with those on food production or consumption. For example, in the United States, items such as sugar consumption are under-reported by households, resulting in a large gap between energy availability as constructed from a food balance sheet and energy consumption as reported by households. One reason, besides waste, for the discrepancy is that food balance sheets are constructed from data on unprocessed commodities, while consumption involves processed commodities. It might be necessary to construct transformation factors to go from one set of figures to another.

An important unresolved question was that of transitory hunger. The fear was expressed that purely temporary changes in a country's food security position would receive excessive weight in computing the undernourishment figures. The opposite view was expressed by another participant who wondered whether the fact that the Asian crisis was not reflected in the FAO figures had anything to do with the focus on food availability as opposed to access. Another participant asked if FAO intended to produce indicators of transitory food insecurity, particularly as emergency food needs had grown exponentially in recent years. It was stated that United States Department of Agriculture (USDA) does attempt to distinguish chronic from transitory food insecurity.

In reply, it was stated that FAO focuses on capturing chronic food insecurity. For example, three-year averages are used to compute the figures on undernourishment. Other market information-based indicators are available and are often used to measure transitory food insecurity. However, the FAO method did not focus on this aspect. Another participant asked why the statistics on the "depth of hunger" reported in the State of Food Insecurity 2000 were no longer being reported by FAO. In reply, it was stated that this measure was not readily comprehensible to policy-makers and so was no longer compiled.

KEYNOTE PAPER ABSTRACT

The Use of Household Expenditure Surveys for the Assessment of Food Insecurity

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This paper explores the use of household expenditure surveys for assessing food insecurity among people in developing countries. The main objective of the paper is to lay out the background information needed for assessing the reliability, validity and practical usefulness of measures of food insecurity obtained from such surveys. From this standpoint, four main strengths of household expenditure surveys are identified. The first is that they are a source of multiple, policy relevant and valid measures. These are: (1) household food energy deficiency; (2) dietary diversity, a measure of diet quality; and (3) the percent of expenditures on food, a measure of vulnerability to food deprivation. The second strength is that they allow multilevel monitoring and targeting. The measures can be used to calculate within-country, national, regional and developing-world prevalences of food insecurity and to monitor how these change over time. Because the food data are matched with various demographic characteristics of households, they can also be used to identify who the food-insecure are. The third strength is that they allow causal analysis for identifying actions to reduce food insecurity – information that is vital to policy-makers and programme designers intending to reduce food insecurity. Finally, given that food insecurity manifests itself at household and individual levels, as the data on expenditures are collected directly from households themselves they are likely to be more reliable than those derived from data collected at more aggregate levels. The main weaknesses of household expenditure surveys for the purposes of measuring food insecurity are: (1) they are currently not undertaken on a regular basis in all developing countries; (2) data collection and computational costs in terms of time, financial resources and technical skill required are quite high; (3) data are not collected on the access to food by individuals within households; and (4) although reasonably reliable estimates of food insecurity can be obtained, estimates may be biased owing to various systematic, non-sampling errors.

DISCUSSION GROUP REPORT

Household Expenditure Surveys

Chair: *Jean-Pierre Habicht*

Discussion openers: *Antonia Trichopoulou and Sergio Lence*

Rapporteur: *Josef Schmidhuber*

The main areas of the discussion were:

- The comparability of survey information across countries.
- Differences between food accessibility and food intake. The discussion of this problem was taken far beyond the traditional focus on differences due to periodicity problems, food consumption by guests, workers, pets and losses in terms of household waste.
- The need for a better understanding of what the notion of food vulnerability really entails, how important it is for food insecurity across different countries and how the probability of facing a future food shortage can be related to an average (mean) food availability level.

Ms Trichopoulou opened the discussion with a report about her own experience in analysing household budget/expenditure surveys. One of the outstanding problems in the work with household surveys is the lack of comparability of results across countries. She stressed that even in advanced European economies, comparability of the results from these surveys is limited and more should be done to make the results of household surveys comparable. Such efforts could include:

- common guidelines for data collection, compilation and interpretation;
- common guidelines for error detection and remedies to solve inherent data problems;
- most importantly, a common coding system for food composition tables so that food preparations have the same meaning across different countries.

A first step towards solving these problems would be a study to identify the main problems associated with the collection, compilation and interpretation of household surveys. Focus should be placed on the comparability of food composition tables.

Mr Lence focused on the “predictive validity” (or more precisely “convergent validity”) of household expenditure surveys in assessing food intake levels. The predictive validity captures the extent to which the results from household expenditure surveys (food availability) are good predictors for the results from actual food intake information. This is an important question because predictive validity was identified as one of the main advantages of household expenditure surveys.

The discussant sought to clarify the question on the basis of two country cases (Kenya and the Philippines) for which data on both food intake from 24-hour recall and food expenditure surveys were available. A close inspection of the data gave rise to a number of questions.

What are the results of comparing food intake information to food expenditure data?

- The means of the two surveys, i.e. the energy intake from the 24-hour recall and food expenditure from the seven day food acquisition surveys, are very close to each other.
- Also the marginal distributions of the two “experiments” are very similar in both countries and over the four repetitions of the two experiments.
- However, when juxtaposing the information from the two experiments for the individual observations, i.e. the reported food intake and the reported food acquisition at the level of an individual person, the

correlation was rather weak. The correlation coefficient was 0.35; a simple regression of food intake on food acquisition (for individual observations) would have rendered an R^2 of merely 0.12.

What could be the reason for the low correlation and thus the possibility that one may overestimate the predictive validity of household expenditure surveys for actual food intake?

The discussant suggested that there is a need to have a closer look at problems that plague survey information in general, not only household expenditure or food intake surveys. Quoting a study by Bertrand and Mullainathan, he identified cognitive problems and social desirability problems as the two main areas to look at. Cognitive problems include those that arise, *inter alia*, out of the structure of the survey. The order of questions, the wording, the scales and the mental effort required to answer questions can have an impact on the results. Social desirability problems occur when, for instance, respondents do not want to look bad in front of interviewers. Over and above social desirability and cognitive problems, strategic behaviour or simply not telling the truth can affect the validity of survey responses.

What are the main conclusions from this exercise?

The main suggestions forwarded by the discussant were that the predictive validity of the household surveys for measuring food security can easily be overstated. In fact, the data available (although scarce) suggest that household expenditure surveys may be plagued with non-negligible validity or reliability problems in assessing food security. This calls for added efforts to improve the validity and reliability of household surveys in assessing food security.

The free discussion focused on two main areas:

- *Can, and if so, how can the possible lack of reliability in household expenditure surveys affect the estimates of undernourishment and food insecurity?*
- *How can we better define and assess food vulnerability?*

The starting hypothesis for evaluating the first question was that we observe a surprisingly low correlation between two measurement methods for the same theoretical construct of food availability. If this lack of correlation is due to unreliability of the information observed, i.e. that most of the observed variability is due to a high amount of random noise, there is a risk that the measured level of undernourishment overestimates its true level. The reason is that at the cutoff point, we evaluate a distribution that has a larger variance, resulting in a higher percentage of hungry.

In response to the second question, it was generally felt that the concept of food vulnerability requires a more precise definition. While the share of food expenditure in total expenditure may be a good starting-point for assessing vulnerability, it is not sufficient within a given economic environment, and the same food expenditure share would not necessarily represent the same level of vulnerability across different economic environments. There was a consensus that other factors need to be taken into account. These include:

- Seasonality of food availability, notably differences between rainy season and dry season.
- A clear definition of the reference period and the time horizon. Neither the measurement period nor the survey period of household surveys may be appropriate to assess vulnerability.
- Vulnerability should also include the availability of (food) credits, e.g. an account at a food shop may help bridge periods of high prices and insufficient access to food.
- Price variability for basic foodstuffs is important to consider when assessing the probability at which average expenditures may become insufficient to purchase enough food. Price spikes and their probability could be of particular importance in this regard.
- There is also the need to distinguish truly random factors (e.g. civil strife or an abrupt change in the social security system) from non-random developments (seasonality). The main difference lies in the predictability of such events. As the effects of seasonality are predictable, precautionary measures can be put in place to mitigate possible future problems.

KEYNOTE PAPER ABSTRACT

Individual Food Intake Survey Methods

Anna Ferro-Luzzi

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This paper describes the suitability of individual-level information on dietary intakes for estimating the state of food security of population groups at national or subnational levels, and illustrates the constraints, shortcomings and potential advantages of this methodological approach. It begins by specifying that consumption of foods in a quantity and quality sufficient to meet energy and nutrient requirements represents the core of the food security concept, and that any consideration relating to the subjective perception of deprivation or a condition of poverty comes second. The paper reviews the diverse methodological approaches available for assessing individual food intake and briefly describes their inherent and logistic constraints, as well as the need to adapt them in specific socio-economic and cultural contexts. An overview is provided of the stringent research that has gone into the improvement of the quality of data collected and the level of reliability of the data that can be achieved. The degree of flexibility afforded by the individual dietary survey methods, the availability of effective validation and standardization procedures, and the nature of the information obtained are features that are unique to this methodological approach. Also unique is that its error structure is far better understood than for any other method employed for assessing food security, and independent validation of the results through concurrent measurement of energy expenditure by the doubly labelled water approach is feasible. Finally, this is the only existing method that can reveal intra-household distribution of food. Neglecting to account for the potential of unequal intra-household allocation patterns may lead to faulty conclusions relative to the food security of the household and may mask the existence of at-risk subgroups in the community. The paper identifies the phenomenon of under-reporting as the main weakness of the method, but also considers that logistic considerations and the cost of the surveys are potential constraints. The paper concludes that the individual dietary survey method is a robust approach for assessing food security, but its cost and other considerations, such as logistics, the degree of collaboration required from subjects and particular cultural constraints, make its use difficult, especially in developing regions of the world. It also concludes that this method is of great value for the validation of other, more expedient methods for assessing food security.

DISCUSSION GROUP REPORT

Individual Food Intake Surveys

Chair: *Walter Willett*

Discussion openers: *Jeanne de Vries and Lauren Lissner*

Rapporteur: *Marie-Claude Dop*

Ms de Vries and Ms Lissner complemented Anna Ferro-Luzzi's comprehensive overview of individual dietary assessment methods with an in-depth discussion of issues of validity of the methods (owing to errors inherent in the measurement of food consumption and/or owing to characteristics of the subjects), and of cost and feasibility.

Ms de Vries stated that the choice of a method for assessing food security and undernourishment should be based on several criteria – the type of information the method is capable of providing, cross-country comparability, costs involved, and types of measurement error and ways of correcting them. Individual food intake survey methods can reasonably provide the mean and the distribution of energy intake and thus give an estimate of the prevalence of undernourishment in a population, although anthropometric monitoring is a reliable alternative. Individual intake surveys, in addition, could be useful to assess food patterns and to provide estimates of intake of particular foods, of interest when food composition tables are incomplete or inaccurate.

The three main sources of error encountered in these types of surveys are reporting errors, coding errors and errors in food composition tables. There are two types of errors, random and systematic, both of which can have within- or between-subject components and can affect the estimates of prevalence of undernourishment. While random errors may sometimes be reduced by increasing the number of subjects or days of measurement, systematic errors can rarely be corrected for.

Two methods are likely candidates for assessing the prevalence of undernourishment: repeated 24-hour recalls and food frequency questionnaires (FFQ). The repeated 24-hour recall is open-ended and is not culturally based, and so it is suitable for populations of different ethnicities and allows cross-country comparisons to be made. The FFQ, on the contrary, uses a closed list of foods and may not be comparable across countries. The time to explain and administer the methods is about the same, but coding is much longer with the 24-hour recall, while development is much more laborious and time-consuming with the FFQ. Respondent burden is low with both methods. Thus, the most appropriate method in terms of validity and feasibility would be the repeated 24-hour recall combined with anthropometry. Nevertheless, validation/calibration studies would be needed. Strict standardization of procedures would be useful to minimize errors.

Ms Lissner also addressed problems of errors in individual intake surveys. She gave examples of biases observed in the context of studies conducted in western countries, in particular among obese subjects, that highlight the complexity of errors encountered in dietary assessment.

Studies using biomarkers such as the doubly labelled water method and 24-hour urinary nitrogen have proven that under-reporting is common in dietary assessment surveys – both general under-reporting in whole populations and selective under-reporting by obese subjects.

The so-called “normative biases” are related to the social desirability of intakes, as subjects tend to report socially acceptable intakes. This type of bias can have intentional and unintentional components. Some under-reporting is general and some is related to obesity.

Social desirability biases are compounded with other sources of error, such as memory or recording errors. For instance, during record-keeping, some subjects will underconsume and thus appear to be under-reporting. The subjects' knowledge of being observed reduces under-reporting but does not eliminate it

completely. In retrospective clinical studies, there is a high risk of information bias, i.e. the subjects' knowledge of the diagnosis will distort their memory of food intake.

An important issue is to identify foods and/or nutrients that are selectively under-reported. Some studies have shown that fat and carbohydrate intakes are under-reported to a larger extent than protein. Other studies have shown that the obese under-report specific foods, e.g. snack foods and alcohol. Nevertheless under-reporting of foods varies across studies. It may be unintentional in the case of certain foods. For example, foods that are easy to forget, such as snack foods, are often omitted.

Normative biases are probably also encountered in undernourished populations. Both over-reporting of socially desirable foods and omission of undesirable foods are possible, but studies are needed to assess whether these biases exist. In countries whose population is undergoing a nutrition transition, obesity-related under-reporting is likely to be encountered. Biases need to be assessed and understood so that their impact on assessment of food intake can be estimated.

In the discussion that followed, the group concluded that individual food intake methods have a much stronger basis than most of the other methods discussed at the Symposium, i.e. the FAO methodology, household income and expenditure surveys, and qualitative indicators of hunger. Individual food intake methods have been scrutinized much more intensively than other methods. Many validity and reliability studies have been conducted, and so the error structure is well known, while the validity of the other methods still needs to be assessed. Moreover, these types of surveys are feasible. Their costs are not greater than household income and expenditure surveys that are presently being conducted in many developing countries. After this discussion of validity issues, the group examined the question of whether individual food intake methods were useful to assess the prevalence of undernourishment, defined as energy insufficiency, or whether they might be useful to measure other relevant information on consumption. The discussion group's opinion was that individual food intake methods were useful for assessing acute energy insufficiency, for instance in situations of famine, but were not accurate or precise enough to assess chronic energy insufficiency. Small daily energy deficits, e.g. deficits of 100-200 kcal/person/day, can lead in the long-term to energy insufficiency. Deficits of this magnitude cannot be detected by individual food intake methodology. Moreover, there is some uncertainty in the estimation of energy requirements of populations because physical activity levels cannot be assessed precisely at the population level. Therefore, energy balance derived from estimates of dietary intake and requirement would not be precise or valid enough to serve as a basis for the assessment of prevalence of undernourishment.

The group felt that individual dietary intake was a more appropriate method for assessing nutrient insufficiencies and other aspects of the diet that are important with regard to undernourishment and health. The concept of undernourishment referred to was broader than mere energy insufficiency. These other aspects of the diet include:

- § diet quality;
- § food patterns;
- § intakes of individual foods and food groups;
- § intakes of macronutrients;
- § diet composition (e.g. percent of energy from fat);
- § intakes of micronutrients.

The participants agreed that two 24-hour recalls would provide the mean and distribution of food and nutrient intakes in the population after removing the within-subject variation of intake. Assessment of this type would be useful at the national level, but also at the subnational level, in order to identify groups at risk of dietary deficiencies and to target interventions.

The group then discussed which other methods among those discussed at the Symposium would be of interest to assess undernourishment in its broader definition. Although all methods provide relevant information, it was stated that simple anthropometry (height and weight) was the most useful and cost-effective measurement. The group recommended that anthropometry be integrated not only into individual food intake surveys or household income and expenditure surveys, but also into all economic or health surveys and surveillance programmes. Moreover, these programmes would benefit from the information supplied by anthropometric measurements.

Apart from surveys at the national level, anthropometry should be integrated into surveillance programmes using sentinel sites or, for example, into country-level FIVIMS programmes.

The group gave some practical recommendations regarding cost-effective and feasible data collection efforts at the country level, taking into account the resources that countries could devote to assessment. If resources are very limited, only anthropometry should be measured. With more resources, countries could choose to do one 24-hour recall, or one recall in the total sample and a second recall on a subsample to allow for the estimation and removal of within-subject variability. If resources permit, biochemical indicators should be added, for instance determination of haemoglobin or haematocrit and serum retinol where relevant.

Some participants thought that existing sources of information could be used to assess dietary quality and related aspects. For instance, food balance sheets could provide information on micronutrient availability at the national level.

First, the group concluded that individual food intake methods were not able to assess energy deficiency in populations in a sufficiently valid and precise way. Second, the group stated that anthropometry was the most important and cost-effective indicator of undernourishment. Third, the group agreed that a broader definition of undernourishment was more relevant than the assessment of energy insufficiency *per se*, and that this definition should encompass other nutrients and diet quality, for which individual food intake methods could provide useful and valid information.

KEYNOTE PAPER ABSTRACT

Measures of Nutritional Status from Anthropometric Survey Data

Prakash Shetty

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FAO is mandated to provide reliable figures of the true extent of the problem of undernutrition to help Member Nations in monitoring trends, determining priorities and evaluating the effectiveness of intervention programmes. In order to do that, there is a need to detect undernutrition in individuals and to assess the severity of the problem in the community. This paper evaluates the use of nutritional anthropometric measures to estimate the numbers of undernourished while highlighting the advantages and limitations of nutritional anthropometric approaches. It addresses issues related to reference values and discusses cutoffs based on the relationship between nutritional anthropometric indices and functional impairment, morbidity and/or other evidence of the consequences of food inadequacy. It also attempts to relate this approach with the other approaches discussed at this Symposium. Nutritional anthropometric measurements, indices and indicators are defined and the commonly used indicators for the diagnosis of undernutrition throughout the life cycle (i.e. infants, children, adolescents, adults and elderly) are discussed. The validity, reliability and uses of these anthropometric indicators in different situations in the field and communities are also discussed. The paper emphasizes the need to carry out properly sampled, representative surveys to aid this process and highlights the role these nutritional indicators can play in assessing the impact of the developmental process, the effect of nutritional and other interventions, and the consequences of adverse situations such as food emergencies resulting from conflict, natural disasters and economic downturns.

Given the recent controversies related to differing estimates of national and regional numbers of undernourished derived from the FAO food balance method and anthropometric indicators of children and adults, an attempt is made to look at two specific instances where comparative analyses have been carried out. The first is a comparison of data based on these two approaches in nationally representative samples in Brazil. In this case study, correspondence plots and related analyses support the conclusion that both methodological approaches have merit and are likely to provide complementary information. Food consumption surveys are more difficult and expensive to carry out on a nationally representative basis at periodic intervals and are plagued with difficulties related to obtaining individual data from household information. Anthropometric data, however, do not necessarily reflect food consumption or energy adequacy *per se* as they are influenced by other environmental determinants of nutritional status, such as infections. The latter opinion is supported by critical comparative analyses of data derived from these two approaches in several developing countries. These analyses indicate a lack of correlation between the estimates of undernutrition in children and adults when comparing anthropometric data with measures of adequacy of dietary energy supply. It would appear, however, that even though the two approaches reflect different determinants, they do provide complementary information. Should simple, reliable objective anthropometric indicators be used more widely in national surveys, continuity of data collection, projection of trends and long-term forecasts of food needs could be made based on the relationship between these two approaches. Further, anthropometric data in adults are not currently available on a global or regional basis to compile meaningful and representative databases, unlike the data available using the currently well-established FAO method, which provides a continuous source of global data despite its limitations.

DISCUSSION GROUP REPORT

Anthropometric Surveys

Chair: Mercedes de Onis

Discussion openers: Peter Svedberg and Stephan Klasen

Rapporteur: Gina Kennedy

The speakers opened the discussion by reviewing some of the advantages and weaknesses of using anthropometry to estimate the prevalence of undernutrition, and by comparing this approach to the FAO method. One of the major strengths of anthropometry mentioned was that it is an outcome measure and therefore is well suited for monitoring and evaluating interventions. Anthropometry can be used also to track individual status. For example, in growth-monitoring programmes, an individual child's weight can be monitored over time in order to track positive, negative or stagnant trends in weight gain. This can be a powerful tool in a community setting and has been used within the framework of many community nutrition programmes. Another important advantage of anthropometry mentioned was that the measurements are often carried out in the context of larger household surveys that collect data on many aspects related to outcome, such as health status, household income, literacy rates and access to clean water. Some of the weaknesses that were pointed out included the lack of internationally accepted indicators for children six to 18 years of age and the scarcity of data on BMI, particularly for men.

Both speakers highlighted that the FAO method and anthropometry do not show geographical concordance. For example, the FAO method finds that sub-Saharan Africa has the largest number of undernourished, while South Asia has the highest prevalence of underweight children. A method was presented that attempted to reconcile conflicting evidence seen arising from cross-country comparisons of the various indicators. It was proposed that a model factoring in both physical activity levels and health status of populations could be used to provide an empirical explanation for the lack of association between prevalence of underweight and undernourished. In order to apply the model, several factors would need to be taken into consideration, such as valid variables for measuring physical activity level and health status of populations and their distribution across countries.

Most participants were not concerned over the lack of concordance between methods, as they measure different things. Anthropometry is an outcome measure encompassing various factors including food, health status and general care patterns, while the measurement of undernourishment is a gross calculation based on per capita food availability. Many participants stressed the need to concentrate on trends more than on levels or absolute numbers. Country trends are particularly useful for determining the rate and slope of progress or regress. However, numbers were seen as powerful advocacy tools that can be used for political motivation. Numbers were also seen as useful to calculate the cost of interventions. For example, numbers are useful for determining the cost of supplying vaccines to at-risk populations. Lastly, the group stressed that any improvements to the methods should be both affordable and replicable. The idea that indicators do not need to be measured every year was widely supported.

The group summarized the uses of anthropometric indicators for children, adolescents and adults. Participants agreed that the use of anthropometry among children under five years of age has reached a level of international consensus. The availability of these data can contribute to the assessment of vulnerability in populations. However, there is a lack of information and there are no accepted indicators for the adolescent ages. The most important factor related to the difficulties of developing appropriate indicators for this age group is the effect of puberty, which has varied ages of onset and differs in intensity and duration from one individual to the next. Anecdotal evidence from the group also indicated that this age group is particularly difficult to capture at home and that non-compliance is a factor in lack of progress toward developing valid indicators. The group stressed that the use of BMI as an anthropometric indicator for adults is relatively new compared with the indicators used to assess child growth, and therefore needs more time to develop. While there is evidence linking a low BMI to increased morbidity, mortality, decreased work productivity and low birth weight in offspring, increased efforts are needed to establish these relationships.

Several recommendations were made during the discussion regarding the future role of anthropometric indicators. It was suggested that anthropometric data always be presented together with confidence intervals and information on the distribution (mean, Z-score and standard deviation). Nationally representative data should continue to be collected on children through surveys such as the Multiple Indicator Cluster Surveys and Demographic Health Surveys or similar national initiatives, with intensified efforts for countries where data are scarce. The information necessary to calculate anthropometric indicators (weight, height, age and gender) should always be collected. For adolescents, efforts should be intensified to develop appropriate indicators. For adults, weight and height data necessary to calculate BMI should always be collected for both men and women during surveys. It was felt by the group that the international community needs to reach a consensus on issues such as appropriate age groupings and BMI cutoff points, as has been accomplished for child anthropometric indicators.

KEYNOTE PAPER ABSTRACT

Qualitative Measures of Food Insecurity and Hunger

Eileen Kennedy

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Increasingly, policy-makers and programme implementers have been seeking measurement techniques for food insecurity and hunger that are simple to use and easy to analyse. The present paper reviews experiences to date on qualitative measures and discusses the potential for expanded use of these methods, particularly in developing countries.

Until recently, concepts of food insecurity and hunger in many countries have been linked to clinical signs of malnutrition. There has been a clear need to provide sensitive indicators of food insufficiency and hunger that are poverty-driven and not limited to clinical definitions. Rigorous research in the 1990s led to the development of methodologically sophisticated and empirically grounded measurement scales for food insecurity and hunger. A food security module was administered in April, 1995, as part of a nationally representative sample of 45 000 American households. The 18-question module provided a means of measuring both the prevalence of food security and the severity of hunger in the United States. Validation of the food security scale found that food insecurity is significantly negatively correlated with income and household food expenditures. The qualitative food security scale also correlated significantly with the more traditional measures, such as energy intake per capita.

Many countries have moved in the direction of exploring the development and use of qualitative food security measures. These measures are well grounded in science and, once the developmental work for the methods is completed, are quick to administer and analyse. The information from these methods also provides a concept of food security that is well understood by policy-makers. A major advantage is that qualitative measures incorporate as essential elements the perceptions of food insecurity and hunger by the people most affected. Thus, many view these qualitative methods as more direct measures of food insecurity than other proxy measures.

DISCUSSION GROUP REPORT

Qualitative Measures

Chair: Kathy Radimer

Discussion openers: Helen Jensen and Stephen Devereux

Rapporteur: Sean Kennedy

Opening discussion

The Chair and the two discussion openers established a tone of balanced optimism that carried into the general discussion. Both of the discussion openers emphasized the potential contributions of qualitative measures and highlighted the need for continuing research and development.

From ... review of studies that have applied the Food Security Module across time, across populations and subpopulations and in targeted special surveys, the similar ranking of questions and hence observation of common phenomenon or process indicates that scientifically grounded qualitative measures offer a potentially valuable addition to the more commonly applied measures of hunger and food insecurity. (Helen Jensen)

Further refinement of these qualitative methodologies could be extremely rewarding in terms of providing complementary data for national and global food security monitoring. Whether these methods have the potential to be scaled up to the national level at reasonable cost and whether robust, generalizable indicators can be found that allow cross-country comparability is an open question. (Stephen Devereux)

General discussion

Some of the initial dialogue reflected differing expectations among the participants regarding the scope of the discussion. Essentially, the question was whether the group should consider qualitative measures in general (including the Household Economy Approach, Group Rankings, etc.) or focus on the keynote paper presented in plenary by Eileen Kennedy. The outcome was an open discussion of both, touching on the range of qualitative methods available and addressing specific questions related to the keynote paper. It also became clear during the exercise that the term "qualitative" was problematic, which is revisited below in the recommendations.

Key Points on the Keynote Paper

- *Validation.* A specific qualitative instrument (the USDA Food Security Module) has now been extensively tested and proven robust in the context of the United States. Similar instruments are currently being field-tested in other country contexts, notably Bangladesh,¹ Burkina Faso,² and India and Uganda.³ Case studies from these countries were presented during the parallel contributed papers sessions of the Symposium.
- *Measurement.* These measures contribute important dimensions of how households actually experience hunger and food insecurity. Experiential dimensions include emotional effects such as anxiety over not being able to meet the basic needs of the household, as well as behaviour changes such as reducing the

¹ P. Webb, J. Coates, R. Houser. *Challenges in Defining "Direct Measures" of Hunger and Food Insecurity for Bangladesh: Preliminary Findings from Ongoing Fieldwork.* Contributed paper. International Scientific Symposium on Measurement of Food Deprivation and Undernutrition. FAO, Rome, June 26-28, 2002.

² E. Frongillo, S. Nanama. *Development and Validation of a Questionnaire-Based Tool to Measure Rural Household Food Insecurity in Burkina Faso.* Contributed paper. International Scientific Symposium on Measurement of Food Deprivation and Undernutrition. FAO, Rome, June 26-28, 2002.

³ M. Nord, A.K. Sapathy, N. Raj, P. Webb, R. Houser. *Comparing Household Survey-Based Measures of Food Insecurity Across Countries: Case Studies in India, Uganda, and Bangladesh.* Contributed paper. International Scientific Symposium on Measurement of Food Deprivation and Undernutrition. FAO, Rome, June 26-28, 2002.

number of meals or going a day without eating. In practical terms, once the measures have been developed, they are relatively easy to administer and have a low time burden for respondents.

- *Usefulness.* The results generated by the Food Security Module are potentially informative at multiple levels:
 - § At the policy level, they are relatively uncomplicated to interpret and understand, which can be critical in policy analysis and presenting resonant messages to policy-makers.
 - § At the programme or project level, they can be effective in targeting interventions (specifically for identifying populations or geographic areas, but not for identifying households or individuals) and in monitoring changes in food insecurity and hunger.
- *Comparability.* Is the methodology comparable across different cultures and countries?
 - § Experience from other countries indicates that, in general, the United States module should not be simply translated for use in other contexts. However, there was at least one case (Russia) where the United States module was applied with limited adaptation and still produced interesting results.
 - § Significant development and pre-testing is needed to determine core elements in most country and subcountry settings.
 - § As field trials become available from an increasing variety of settings, some relatively “universal” dimensions of food insecurity and hunger may or may not materialize.
 - § Even where a scale works well, it can and should be periodically updated according to social acceptability (for example, in a culture where it is currently expected that adult men will eat before women or children, the social acceptability of those attitudes and practices may change over time).

Recommendations for action

Two recommendations emerged from the discussion regarding actions that could further the development and use of qualitative methodologies.

- *Refine the terminology.* A number of speakers noted that the US Food Security Module and equivalent methodologies should not be termed “qualitative” when the results are quantified in a statistically rigorous manner (as opposed to classic qualitative research techniques such as focus group discussions, key informant interviews, direct observation, etc.). Although consensus was not reached concerning more appropriate terminology, several options were suggested including “direct”, “experience-based” or “experiential” measures of food insecurity and hunger.
- *Need for a clearinghouse.* FAO or FIVIMS should initiate a clearinghouse for new developments in “qualitative measures” of food insecurity and hunger, such as a subsite under www.fivims.org where researchers and practitioners post or access instruments, experiences and results from ongoing field tests. An early activity of the clearinghouse could be to host an online dialogue to resolve the issue of appropriate terminology.

Conclusion

The discussion group recognized promising aspects of the Food Security Module and similar modules being adapted for various countries or cultural settings and acknowledged positive points regarding the validity, relevance and usefulness of the methods. The prospects for eventual comparability of findings across countries and cultures were actively debated, and there was clearly a sense of optimism that significant progress is feasible. Participants effectively agreed on the need for continuing the process of refining and field-testing the instruments.

The fundamental complementarity of qualitative and quantitative measures was an unambiguous point of consensus. Qualitative measures are designed to add vital information, such as the experiential dimensions of food insecurity and hunger, and are in no way intended to replace or substitute widely accepted quantitative indicators such as anthropometric survey data, household expenditure surveys, dietary intake assessment or the FAO methodology.

KEYNOTE PAPER ABSTRACT

Measuring Hunger and Malnutrition

John B. Mason
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Five types of methods are used for assessing the extent of hunger and malnutrition, each having different applications and comparative advantages in terms of uses for advocacy, policy analysis and decisions, and research. Three of these, the FAO method, household income and expenditure surveys (HIES) and food intake surveys (FIS), estimate dietary intake and try to relate this to energy needs, of which physical activity is the largest single component yet the least measurable. The fourth assesses perceptions of hunger and behavioural response (qualitative methods), and the fifth measures physical effects on growth and thinness (anthropometry). Not only is there no absolute measure (or “gold standard”), but these methods assess different aspects of hunger and dimensions of its effects on health, suffering, behaviour and economics. None the less, triangulating on trends in “hunger” is a reasonable goal and is the underlying intent of the internationally agreed upon obligation to accelerate reduction in the numbers of people affected.

In principle, the ways ahead are suggested as: shifting towards trend assessment based on patterns of related indicators that capture different dimensions of hunger; estimating global and regional trends every few years with the current FAO methods, with more detailed assessments in selected (“sentinel”) countries through household and individual surveys; developing qualitative methods in the local contexts and starting to use these as modules in other surveys; using small-scale studies for policy and causality research; and balancing resource allocations based on required outputs and decision needs.

The associations between income, dietary energy intake and anthropometry can be understood from national data and point the way to interpreting trends. The prevalence of child underweight differs by income bands. Within countries, the relationship of child underweight prevalence with income appears to be non-linear. This is consistent with child malnutrition being caused by a number of interacting factors, several of which may need to improve before an impact is seen on child growth. Across countries, greater variation is seen with location than with income. In South Asia, child growth responds much faster to increasing income or food availability – in line with the high incidence of low birth weight and related inter-generational effects. Patterns of within-country indicator trends can be interpreted in relation to food, health and nutritional factors. To this, there is a need to add diet quality, derived from food supply estimates, surveys of food availability and intake, and clinical and biochemical measurements. Combating hunger to promote health and productivity clearly includes adequacy in micronutrients to prevent anaemia and retarded child development, to improve resistance to disease and to bring other benefits.

Based on the detailed descriptions of methods in the other keynote papers, it is clear that the characteristics of the different methods can be complementary, although further research and investments in application will be needed. Not only are indicators expected to go in the same directions, but results from one method can validate others (e.g. underweight and energy inadequacy) with due attention to the concepts and cutoff points involved. In particular, development of the behavioural qualitative methods based on those used to estimate hunger in industrialized countries is suggested, with further use of HIES (calculating dietary energy from survey questions), and application of FIS methods in selected countries to produce time-series data. FAO food balance sheet data should be processed also to track diet quality and micronutrient availabilities.

Sustained application of these approaches can lead to valid and understandable assessments of progress in combating hunger, which would be powerful in advocacy terms and important for understanding policy successes and defining new initiatives. Fewer hungry people should result.

DISCUSSANT REPORT

Synthesis of the Five Methods for Measuring Hunger and Malnutrition

Chair: *Haluk Kasnakoglu*

Discussant: *Siddiqur R. Osmani, University of Ulster, UK*

John Mason's paper provides an excellent synthesis of five alternative methods of measuring hunger and malnutrition. In addition to synthesizing, the paper also makes a number of very important points. I would like especially to draw attention to the following three:

- The alternative measurement methods considered in this Symposium should be seen not as competing with each other but as complementary approaches to capturing various aspects of a multi-dimensional concept. I shall argue presently that this contention needs to be refined further, but the essential point is certainly valid.
- The focus of measurement should be on trends rather than levels. Given the margin of error involved in the empirical estimation of various parameters used in the measurement exercise, this is certainly sound advice. Provided the same methodology is used consistently for successive estimates, assessment of trends would be more reliable than the assessment of levels; for policy purposes it is, after all, trend that matters more.
- The focus of measurement should be broadened to include trends in the intake of micronutrients and, to a lesser extent, protein, in addition to the usual concerns with dietary energy. In view of our emerging knowledge about the critical importance of micronutrients for both physical and mental development, this suggestion deserves serious consideration.

Under issues applying to all the methods, the paper asks the critical question: What is being measured by them? According to the paper, different aspects of hunger are being measured. But how are we to define hunger operationally? In other words, which definition would yield a meaningful measure of the prevalence of hunger? Here the paper quotes approvingly from the Sixth World Food Survey: "the number of people who do not get enough food energy, averaged over one year, to both maintain productive activity and maintain body weight".

Equating hunger with energy inadequacy does appeal to common sense because clearly the physical sensation of hunger is most directly related to inadequate intake of dietary energy. Given the primordial human urge of avoiding the pangs of hunger, it certainly makes sense to try to quantify the prevalence of energy inadequacy for the purpose of policy-making. I have some difficulty, however, in accepting the proposition that the common underlying objective of all the five methods discussed in this Symposium is to measure different aspects of hunger as defined above. The FAO method is certainly concerned with it. The household income and expenditure survey and food intake survey methods are also often used for the purpose of measuring the adequacy of dietary energy. But the other two methods are much broader in scope.

The qualitative method is concerned with people's perceptions about food deprivation in general, of which energy inadequacy is just one aspect, albeit a very important aspect. In fact, when this method indicates the existence of food deprivation as perceived by the people, the deprivation in question may not relate to dietary energy at all, either in perception or in objective reality. Any qualitative evaluation of people's perception of deprivation is influenced by their relative position in the society. Even if energy intake is adequate, and people do not feel the pangs of hunger, they may still suffer from an acute sense of food deprivation if what they eat is considerably inferior in quality and quantity relative to the average standard prevailing in the society in which they live. What this method would then measure is still very important, but the object of measurement may not have anything to do with any aspect of hunger defined in the sense of energy inadequacy.

Anthropometry is also broader in scope but in a different way. Not only does its concern go well beyond dietary energy to encompass other elements of food, such as protein and micronutrients, but it goes beyond food deprivation itself to encompass health, hygiene and care. As the country experiences discussed in Mason's paper show, trends in anthropometry can diverge systematically from trends in energy adequacy. This is entirely plausible because anthropometry can change independently of energy inadequacy under the influence of non-energy elements of food as well as non-food factors. It would be misleading, therefore, to suggest that all five methods try to measure different aspects of hunger. There is indeed an element of commonality that binds all five methods. However, the common element, in my view, is not hunger but the notion of food deprivation, which is a much broader concept than energy inadequacy. It can be said without fear of contradiction that all five methods are concerned with food deprivation in one way or the other.

But we need to go one step further. In what way are these methods concerned with food deprivation? Can we say, in line with the argument presented in Mason's paper, that the five methods measure different aspects of food deprivation? I believe we can, but we have to be very careful with our interpretation, especially when it comes to the use of anthropometry.

Clearly, the FAO method does try to measure one aspect of food deprivation – namely, the inadequacy of dietary energy. The same can be said about the HIES and FIS methods, both of which can be used to measure inadequacy of either dietary energy or micronutrients derived from food. The qualitative method can also be said to capture an aspect of food deprivation in so far as it shows people's perception about the adequacy of their overall food consumption, either in the absolute sense or relative to the rest of the society.

But anthropometry is a slightly different matter. What it tries to measure is the prevalence of malnutrition defined as impairment of physical and cognitive functions resulting from inadequate nourishment of the cells that constitute the human body. Now it is true that nourishment of cells does depend crucially on food, because cells must derive nourishment ultimately from the food ingested into the body. In that sense, anthropometry can be said to measure an aspect of food deprivation. However, there is a qualitative difference between anthropometry and the other four methods in this regard. The difference lies in the level of deprivation with which they are concerned. The other four methods measure deprivation at the "intake level", the level at which food is ingested into the body, whereas anthropometry measures deprivation at the "cellular level", the level at which food is actually utilized or absorbed by the body. Even when there is no deprivation at the intake level, there may still exist deprivation at the cellular level. For example, a person suffering from ill health may not be able to absorb the food that is ingested. In that case, deprivation will occur at the cellular level and may result in malnutrition. This can be captured by anthropometry even where there is no deprivation at the intake level. Because of this difference, I hesitate to place anthropometry in the same class as the other four methods and to claim that all five measure different aspects of food deprivation. If a cluster of measures captures different aspects of the same concept, the implication is that together, these measures should yield a comprehensive picture of that concept. But the five measures taken together do not yield a comprehensive picture of food deprivation at either the level of intake or the level of utilization – the cellular level. They do not give a comprehensive picture of deprivation at the intake level because in any particular case, anthropometry may be pointing to some deficiency that has nothing to do with inadequacy of intake. And these five measures do not give a comprehensive picture of deprivation at the cellular level because deprivation at this level may be caused by various non-food factors that are not captured by the other four methods. To understand this, we need information on hygiene, health care and personal care.

For this reason, while I am quite willing to accept that all five methods are concerned with food deprivation in one form or another, I would separate out anthropometry and characterize only the remaining four methods as trying to measure different aspects of food deprivation. These four constitute a homogeneous group in that they all measure food deprivation at the level of intake, which is the usual connotation of the concept of food deprivation. I would argue further that this attempt to separate anthropometry from the other four methods is not a matter of conceptual hair-splitting. On the contrary, this is required by the need for clarity at the stage of policy-making. If any of those other four methods indicate food deprivation, the policy implication would be to improve the deprived people's entitlement to food – in quantity or in quality, or both. By contrast, if anthropometry indicates deprivation, improving the entitlement to food need not be the policy implication. Depending on circumstances, policy-makers may have to focus on health and care in addition to, or even instead of, entitlement to food.

All this is not to suggest that anthropometry has no role to play when the immediate concern is with entitlement to food, i. e. deprivation at the intake level. Mason suggests one such role in his paper – to provide an upper bound estimate of the prevalence of hunger. I am not sure, however, that this is a valid role. The underlying idea behind Mason's suggestion is that while hunger is caused by inadequate food intake, anthropometric shortfall is caused by the inadequacy of both food and non-food factors. Therefore, one could argue that the number of people suffering from hunger as measured by the FAO method, for example, cannot logically exceed the number of people suffering from anthropometric shortfall. But the problem with this argument is that it ignores the potential role of physical activity in creating a schism between the two measures. Hunger, as measured by energy inadequacy, is based on a notion of energy requirement, which in turn is based on assumptions about desired levels of physical activity to be undertaken by the people concerned. If the assumed level of physical activity were to correspond closely to actual activity levels, then indeed the number of hungry people could not logically exceed the number of people with anthropometric shortfall. However, it is well known that people, especially children, often reduce their physical activity below desirable levels, in the face of food deprivation, to conserve energy. The energy so conserved may help maintain their physical growth, with the result that they may end up avoiding anthropometric shortfall, while still suffering from inadequate food intake. In that case, the prevalence of hunger could logically exceed the prevalence of anthropometric shortfall, even if there were no measurement errors. The upper bound argument would not work in this case.

Despite the problem with the upper bound argument, I would argue that anthropometry can play a useful role in the analysis of food entitlement in a different way by providing a pointer to possible deprivation at the level of intake. For instance, if anthropometric measurements indicate no progress or even deterioration over time, while independent evidence shows improvement in the levels of health care and environmental hygiene, this would give strong indication that food deprivation at the level of intake has worsened. Although anthropometry is essentially a measure of food deprivation at the cellular level, it may still shed useful light on deprivation at the intake level if it is used judiciously in conjunction with other information, such as health and hygiene that have a bearing on anthropometry.

In this sense, it is indeed true that all five methods, including anthropometry, can complement each other in the analysis of food deprivation. But the nature of complementarity is much subtler than what is captured by the statement that they measure different aspects of food deprivation.

Part III

USERS' PERSPECTIVES

SUMMARY OF THE DISCUSSION

Panel 1: National Users

Chair: *Stanley R. Johnson*
Speakers: *John Owour, Kenya*
Shyam S. Dubey, India
Luis Fajardo, Colombia
Rita Bhatia and Annalisa Conte, WFP
Flora Sibanda-Mulder, UNICEF
Rapporteur: *Jacques Vercueil*

The first message that emerged very clearly from the discussion is that food insecurity is a complex concept both in its manifestation and its causes, and therefore, it is useless to try to determine which measurement is most applicable for this concept. No single indicator or measure can or should pretend to embrace food insecurity. Indeed, we were reminded that food insecurity has many distinct dimensions. These include food availability, accessibility and consumption, outcomes such as nutritional status, and living conditions including poverty and its various aspects. Information on food insecurity, in order to be useful, has to address these different dimensions. We heard suggestions to consider a composite index, but it was observed that any such index may not reveal all relevant aspects and also may not detract from the cost of assembling the basic information embedded in its construction. We were advised, nevertheless, to try to move in this direction and to make something that is complicated a bit simpler.

We have heard several times that although much attention has been placed on the concept of “not enough” or energy deficiency owing to food deprivation, the other aspects of malnutrition, ranging from micronutrient deficiency and anaemia to overweight and obesity, are public health problems that are part of the food insecurity phenomenon and therefore should be given all due attention in terms of both information and action.

A second theme from the discussion dealt with the different measurement methods and the various types of food insecurity information they generate. Anthropometry was mentioned as a fundamental source of information in all the examples and cases we heard today. The importance of this is that anthropometry can address any type of geographical level and can provide trends through time and information on different groups, families or individuals. It was noted, however, that a large amount of anthropometric information is still child-related while little is available on adult anthropometry – data that would be very useful. We saw that comparing adult and child anthropometry in the same population, although yielding diverging signals, can provide important understanding of how things happen. Also, it was noted that for nutritional anthropometry of adolescents, there are still methodological problems to resolve.

Another source of information discussed comes from the various types of household surveys such as expenditure surveys and living conditions surveys, as in the Indian example. While anthropometry provides an outcome but does not clarify the causality behind it, household information is vital in helping to understand the causes and mechanisms at stake, and therefore in leading to appropriate action.

The qualitative or, better named, self-assessment surveys that provide the individual’s assessment of their hunger situation were discussed. The term “self-assessment” is used rather than “self-reporting” because nearly every survey involves self-reporting on some level. This method is very useful because, first of all, it reflects what really matters, namely how the concerned people themselves perceive hunger and how they suffer or not from the situation they are in, providing deeper insights than what may be possible from other methods. Because of the subjectivity and the risk that respondents may attempt to manipulate their responses, this information at first sight could be regarded as soft, but we were shown that if properly developed and validated, self-assessment can become hard information and yield results of more value than a simple collection of opinions – it can become scientific, verifiable data.

There were diverging views about how all these methods can be combined. We heard that anthropometric measurements could be added in household surveys at low cost, or that qualitative information could be put into traditional questionnaires, but we also heard that including anthropometry into other surveys means a large increase in costs. Despite the lack of consensus on how to combine methods, the usefulness of these complementary sources of information was made very clear.

The mapping of information was felt to be of great value. We have seen on many occasions that information needs to be known on different levels and that not only numbers but also trends are dramatically important. Trends indeed may be more reliable than numbers, but the latter remain indispensable for many purposes.

A third major theme was that information collection must be linked to and justified by the use made of the information. We were shown in a number of examples what type of information is used for which type of programme or action, e.g. for determining access to fair shops or to programmes of targeted subsidized prices. We also had concrete examples of this link from UNICEF, where information on food insecurity is used for designing remedial action. This becomes an important concept when discussing the cost (for the surveyor) and the burden (for the surveyed) of information. When information leads to action and policies, it is necessary to obtain the information even if there is a cost involved. In many cases, the benefit of information will outweigh the costs when its collection is justified by a clear link to actions, policies or programmes that rely on valid and reliable information. Another aspect of the use of information is advocacy. Information for this purpose may not be of the same nature as reviewed so far, but advocacy is a necessary function and therefore must be considered part of the different uses of information.

Much of what we have heard is linked to subnational level problems, situations, actions and programmes. At the national level, we have *inter alia* the FAO measurement, or rather the estimate of the number of people undernourished. We have seen that the usefulness of such information is not the same from country to country. We heard that for India, this kind of global assessment is not really of interest because global availability of food is secure and is no longer a problem. This was the case also for Colombia but different in Kenya and Mali. From this, it was clear that the FAO assessment of the number of undernourished is considered fairly valid in some countries, far from the mark in others, and dubious in other cases. When FAO started publishing its estimates of the number of undernourished at the country level, it was very much with the intention of triggering a process of improvement on the estimate, as if to say: "Here are national level data that we have estimated using the FAO method with the information we have received from you." It was expected that some countries would find the assessment valid in their case, while others would challenge it and provide improved data from which a more valid estimate could be based.

Another aspect of the debate that appeared clearly in the example of Kenya, but was also underlined in other cases, is that there is much complexity in the information systems and in the types of information generated and used at national and subnational levels, as well as in relation to the international community. This complexity may result in excessive demands for information together with excessive costs and burden for the population, while the results arising from the use of the information may not be optimal. It was interesting to note, in the case of Kenya for instance, that in the resource-poor Early Warning Area, very positive results had been achieved in coordinating information among many partners in a purposeful fashion in order to support badly needed effective action. The next step would be to move towards adopting the same approach and reaching the same degree of progress in other regions, those better endowed in natural resources but with a more complicated information situation. This shows that no case is desperate and that improvement is feasible, although the process remains difficult.

In this respect, we also heard several times that international organizations are not considered to be very helpful in solving the complication problem. Your message was very clear, that international organizations should in all possible ways help countries and governments to have a simpler and more effective approach to information. On this account, there were references to the fact that FIVIMS does not pretend to add information or create new demands but instead to help countries make better use of the information they already have, to eliminate duplication or to fill in gaps. Above all, however, FIVIMS attempts to bring together institutions that are generating and using information on food security to help them make better use of the information.

As we have seen, there are several different methods to study food security, all measuring something different. Therefore, it is necessary on some occasions to use two or three methods concomitantly on the same population, to see clearly what kind of information each method provides and how well the various methods might bring a different light on the same situation. One can also evaluate whether a priori hypotheses on

convergent or divergent information are borne out, therefore providing information both on the particular situation and on the use of the methods themselves. The Mali case demonstrated how results derived from the use of different methods applied to a particular situation did not necessarily tell the same story. It is indispensable to develop occasions like this purposefully from which one can learn how the various methods work; this also helps those specialized in one method to understand how their approach relates to others.

This issue of the relationship between different methods is linked to a final point raised by our colleagues on several occasions, namely the frequency with which information should be collected and reported. This is, of course, an important issue: as information is usually not needed all that frequently, considerable savings in resources can be made by carrying out surveys at appropriate intervals. For instance, we were given the example of intake surveys that are difficult and costly but provide unique information: they may not need to be done frequently. They can be very useful when conducted at several years' intervals to help calibrate and consolidate the information from less precise and less direct observations. A final message was that among the tasks that can be usefully done in the future, a few well-selected cases where different methods are applied in parallel would greatly help clarify what each one brings and how they complement each other, and would help make precious savings in costs while assuring gains in understanding and effectiveness.

SUMMARY OF THE DISCUSSION

Panel 2: International Users

Chair: *Stanley R. Johnson*

Speakers: *David Wilcock, FIVIMS Coordinator, ESD-FAO*
Suleka Patel, World Bank
Tim Harris, Department for International Development, UK
Altrena Mukuria and Thomas Marchione,
United States Agency for International Development

Rapporteur: *Jacques Vercueil*

The first main result of the discussion this afternoon is how important the MDGs have become. After they were presented by Mr Wilcock, we heard from international organizations as well as donor countries that they are all using the MDGs as their guiding thread for objectives and targets at all levels. We can conclude that the purpose of the MDGs seems to be very well fulfilled, as they now serve as the benchmark for international development assistance, and among their top objectives, we see poverty and hunger eradication. Another observation about MDGs is that they clearly encompass all the dimensions that have been so consistently affirmed as essential for comprehensive understanding of food insecurity, ranging from income poverty to education and health in its different dimensions, and of course hunger and malnutrition. We also noted that they helped to trigger momentum in assembling and enriching the information.

Let me pause briefly on a comment that while reducing hunger is part of both the MDGs and the WFS goals, the expression of these two targets leads to very different objectives. In reality, there is a considerable quantitative difference between the two – between proportions and numbers. The targets of the MDGs and the WFS differ by hundred of millions of people, or by decades, and therefore it is appropriate that these differences be discussed.

As I move from the question of national perspective to international perspective, the topic of this afternoon, let me comment *en passant* about the issue of international versus national demands for data. Data are not collected for the purpose of feeding a worldwide data-base or for monitoring a worldwide target. Rather, information collection is always directed at solving particular problems in a country. However, there is a need for comparability, standardization and harmonization of the data – we heard the need for this expressed repeatedly. This need does create a conflict at the country level between what has been done traditionally and what countries are now being asked to generate and produce. However, rather than countries being asked to generate data they do not need, it is quite often just a question of which particular method they should use to collect the data. This is not unreasonable, because if we collect information in different ways on the same problem in different places, within one country or among several countries, in the end we may not be able to use the information in the most efficient way.

The second main observation is that even though this was a session on “international perspective”, very quickly we were called back to recognize that what is important is not the worldwide objectives, but rather what happens at the country level. While on the international level information is useful for advocacy, monitoring or resource allocation, the country perspective is most important; it is here that real action can be achieved. From this observation, two conclusions emerge: information has to be country-demanded, and capacity building at the country level for generating and for utilizing information is crucial. I would like to underline what was said by the panellists about capacity building, because quite often this critical link is badly missing. It is not easy to create the necessary capacity to generate and utilize information, but it is decisive in changing the demand for, and hence the quality of, generated information – not so much “more” information but “more useful” information – to use for improving policy and action.

This discussion has brought us back again to the relevance of the national FIVIMS – the effort at rationalization and optimal utilization of information systems. One new point I noted was related to the Poverty Reduction Strategy Papers, a very important channel for linking information to action at the national level that should be part of this streamlining effort to improve assistance to policy-makers.

Anthropometry was once again highlighted in several occasions as basic information, and more broadly, nutrition-related information was considered to be extremely important. Indeed, nutrition is important not just as one dimension of poverty but in itself, because improvements on the nutritional front have a direct beneficial impact not only on the welfare of the people but on economic ability at micro- and macro levels, as hunger and poverty mutually reinforce each other.

Vulnerability as a distinct dimension may not be able to be measured with the type of methods we are using now. I understand that much work on vulnerability is still required and that it is a work in progress.

The necessity to justify information indicators by their use for policy decision and preparation for action was reiterated, and this led to our Chairman’s suggestion of this morning to think in terms of a matrix. The matrix column heads would show who does what, the row heads would list the level at which action is taken and the information needs would be specified at the row-column intersections. I find it interesting in a meeting called a scientific symposium, where we would expect to hear mostly about technicalities of nutrition, socio-economy and surveys, that the strongest conclusions concerned the importance of ascertaining that what we are doing with information will be useful in an action-oriented perspective.

We were reminded of the importance of proper terminology and not to use words indiscriminately like hunger, undernourishment or undernutrition, food energy deficiency and so on. While this is well understood, it is also true that as one moves from the technical field to that of politicians and public opinion, it is difficult to adhere to strict terminology and, even more, to avoid using public terminology. The case of “hunger” is very clear. We all know that when the word “hunger” is used, it generally has a very loose, unscientific meaning, but everybody understands it, and therefore it tends to invade a broader field than what might be proper. This is not easy to avoid and thus is a problem.

There were a few more words about the FAO method at the end of the discussion. We heard comments that more of country-based information should be used in this method and that household surveys should be injected into it as well. This, in fact, is the case: the method is based on data provided by countries, and many surveys are reviewed and used when possible. But I must warn that country data and household surveys have very serious problems of gaps, credibility and consistency. Another person asked why the coefficient of variation (CV) should be kept constant through time. Personally I fully agree with this comment, and the only reason I can see for keeping the CV constant is that in the past, very seldom were usable values of the CV available in a country, so when you had one, you did not even dream it could change over time! The situation is different now and while I am not an authority on this issue, I do know the situation reasonably well and I do not see that changing the established approach should create any difficulty other than using a country’s coefficient when it becomes available and changing the value in the formula for the relevant period when it is updated.

I believe, Mr Chairman, that these are the main points in the discussion. Let me add simply that we also heard many colleagues express that they found this meeting quite a useful event, and we all thank you for that.

Part IV

CONCLUDING REMARKS

Lessons Learned

Hartwig de Haen

*Assistant Director-General, Economic and Social Department (ES)
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy*

As we come to the close of this Symposium, a number of things have been reconfirmed and many lessons learned. The first of these is that the fulfilment of FAO's mandate to monitor progress in hunger reduction requires accurate, reliable and timely measures of the prevalence of hunger and malnutrition, food insecurity and vulnerability, and how these change overtime. What we do is extremely important, and even if we do not do it perfectly we should do it in the best way possible.

It was confirmed by your discussions that food insecurity is a multifaceted and complex phenomenon. I think I can safely conclude that there is no perfect single measure that captures all aspects of food insecurity. I have heard the term "suite of indicators" being used in your discussions. This refers obviously to the necessity of describing the phenomenon we need to understand through the use of multiple indicators. We know that food insecurity is determined by food availability, access and utilization as well as by individual vulnerability, and each of these determinants may require a separate indicator. We have discussed several of these already: the FAO measure of food availability adjusted for access; poverty or other indicators of food access derived from household surveys; food consumption from individual dietary intake surveys; anthropometric indicators; and also self-assessed or "qualitative" indicators to measure hunger and vulnerability. You have indicated that a suite of indicators could help identify the relative importance of different determinants of food insecurity. This morning, I heard agreement that the data derived from these measurements should help us to understand why people are food insecure, although this is not the primary task. While the primary task is, of course, to measure the extent of food insecurity or hunger, identifying some of the main causes of hunger will enhance the likelihood that this information can lead to better policies.

A comprehensive discussion has taken place during this meeting of which indicators should be chosen. I can only submit to you several criteria to be kept in mind when considering which indicators to use. The first criterion is how well the indicator measures what it claims to measure, that is, its validity and reliability. Another consideration is how helpful the indicator is in identifying the causes of food insecurity. Also important is how quickly the information becomes available to policy-makers and those who work on hunger-related issues. It is clear that timeliness is essential, especially in the assessment of emergency situations. Necessary action to tackle problems of food insecurity may be delayed if we do not relay the information to policy-makers in time. Another vital consideration is whether the indicator measures and differentiates transitory and chronic food insecurity. And of course, one cannot ignore the cost of obtaining, processing and disseminating the information. Collection costs in terms of time, equipment and training of personnel must be acknowledged, and countries and agencies must determine whether the benefits of using a particular indicator are worth the costs.

Lastly, we must consider the link between the measures or indicators provided to policy-makers and the decisions taken on the basis of that information. One aspect of this problem is the level at which the indicators are collected (internationally, regionally, nationally or subnationally). The FAO indicator of chronic undernourishment cannot be disaggregated to subnational levels, so for that reason alone additional indicators are necessary for policy-making at these levels. Another very important issue that has been discussed widely during the Symposium is whether we should make more use of trends over time and less on absolute numbers when measuring progress. The comparison of trends is very important across countries but is equally important for monitoring change over time within individual countries. A related issue is the frequency with which the indicators are released and the appropriate time intervals for data collection.

This Symposium has been instrumental in suggesting how all of us – researchers, international organizations and government officials alike – can proceed to improve the measurements and the methodologies. It has specific implications for the work we do at FAO. We began in 1999 to issue an annual report, The State of Food Insecurity, in close collaboration with FIVIMS, so the task of collecting and reporting multiple indicators is already underway. We have also used this framework in all reports to the Committee on World Food Security. However, it has been made clear that we must try to better explain the methodology, the database

and the assumptions underlying our undernourishment measures. In light of your suggestions here, we may also need to consider replacing the term “undernourishment” with a more precise term of what we are measuring, such as “food energy deficiency”. We have been made aware of the importance of incorporating data on nutritional outcomes and related concepts into our databases, and we must learn how to use the additional information to improve our indicator. The data on micronutrients and protein, and the measurements of intakes of these nutrients are other areas mentioned for further attention by FAO. We must improve our measures of access to food: this means collecting and analysing more complete information on the distribution of household income, assets and agricultural landholdings, an area that we have not sufficiently covered up to now.

It was suggested in the course of your discussions that we initiate a working group that should strive to improve our understanding of the concepts of risk and vulnerability and to develop indicators that capture these concepts, including further development of “qualitative” measures of hunger, also referred to as “experience-based assessment”, direct assessment” or “self-assessment”.

Currently, most of the information known about food insecurity is compiled and used by international agencies, but developing countries need to take ownership and begin to develop the capacity to compile and use their own data. Through FIVIMS, we will continue to extend support to national governments to generate their own data on indicators for use in national-level policy and decision-making.

In conclusion, what we have discussed together in these three days is just the beginning of a process. We at FAO must continue our scientific work in partnership with you and other experts. Therefore we will be drawing on you and your expertise again, and I invite you all also to stay in contact with us so that we can continue our collaboration for improving measures of food insecurity.

I want to express my explicit thanks to the members of the Scientific Advisory Committee for their effort, to the Government of The Netherlands for their support of this Symposium, and of course to all of you for your fruitful and active discussion of these important issues and suggestions for further work.

Ladies and Gentlemen, this Symposium is closed.

Part V

APPENDICES

Glossary¹

Anthropometry

The use of human body measurements to obtain information about nutritional status.

Body mass index (BMI)

A ratio of weight for height often used to estimate body fat. It is obtained by dividing the weight (in kilograms) by the square of the height (in metres). BMI is not appropriate for assessment of growing children, frail and sedentary elderly individuals, or women who are pregnant or breastfeeding.

Degree of food deprivation

A measure of the overall food insecurity situation in a country, based on a classification system that combines prevalence of undernourishment, i.e. proportion of the total population suffering from dietary energy deficit, and depth of undernourishment, i.e. magnitude of the dietary energy deficit of the undernourished population.

Dietary energy deficit

The difference between the average daily dietary energy intake of an undernourished population and its average minimum energy requirement.

Dietary energy intake

The energy content of food consumed.

Dietary energy requirement

The amount of dietary energy required by an individual to maintain body functions, health and normal activity.

Dietary energy supply

Food available for human consumption, expressed in kilocalories per person per day (kcal/person/day). At country level, it is calculated as the food remaining for human use after deduction of all non-food consumption (exports, animal feed, industrial use, seed and wastage).

Food insecurity

A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity, poor conditions of health and sanitation, and inappropriate care and feeding practices are the major causes of poor nutritional status. Food insecurity may be chronic, seasonal or transitory.

Food security

A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Kilocalorie (kcal)

A unit of measurement of energy. One kilocalorie equals 1 000 calories. In the International System of Units (ISU), the universal unit of energy is the joule (J). One kilocalorie = 4.184 kilojoules (kJ).

Macronutrients

In this document, the proteins, carbohydrates and fats that are required by the body in large amounts and, available to be used for energy. They are measured in grams.

Malnutrition

An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy, protein and/or other nutrients.

Shetty 2002²: Malnutrition arises from deficiencies of specific nutrients or from diets based on wrong kinds or proportions of foods. Goitre, scurvy, anaemia and xerophthalmia are forms of malnutrition caused by inadequate intake of iodine, vitamin C, iron and vitamin A respectively.

¹ <http://www.fivims.net/index.jsp>

Micronutrients

The vitamins, minerals and certain other substances that are required by the body in small amounts. They are measured in milligrams or micrograms.

Minimum dietary energy requirement

In a specified age/sex category, the amount of dietary energy per person that is considered adequate to meet the energy needs for light activity and good health. For an entire population, the minimum energy requirement is the weighted average of the minimum energy requirements of the different age/sex groups in the population. It is expressed as kilocalories per person per day.

Nutritional status

The physiological state of an individual that results from the relationship between nutrient intake and requirements and from the body's ability to digest, absorb and use these nutrients.

Overnourishment

Food intake that is in excess of dietary energy requirements continuously.

Overweight and obesity

Body weight that is above normal as a result of an excessive accumulation of fat. It is usually a manifestation of overnourishment. Overweight is defined here as BMI >25-30 and obesity as BMI >30.

Stunting

Low height for age, reflecting a sustained past episode or episodes of undernutrition.

Undernourishment

Food intake that is insufficient to meet dietary energy requirements continuously.

Undernutrition

The result of undernourishment, poor absorption and/or poor biological use of nutrients consumed.

Shetty 2002²: Undernutrition is defined as having a dietary energy intake below the minimum requirement level to maintain the balance between actual energy intake and acceptable levels of energy expenditure. This must take into account additional needs for growth in children and also for pregnant and lactating women to maintain appropriate weight gain associated with adequate foetal growth in pregnancy and to sustain sufficient milk production during lactation (FAO/WHO/UNU, 1985). In the Shetty paper, the term "undernutrition" was used in the broader sense, referring to any physical condition implying ill-health or the inability to maintain adequate growth, appropriate body weight and body composition or to sustain acceptable levels of economically necessary and socially desirable physical activities brought about by an inadequacy in food, both in quantity and in quality. This definition thus includes both undernutrition and specific micronutrient deficiencies.

Underweight

Low weight for age in children and BMI <18.5 in adults, reflecting a current condition resulting from inadequate food intake, past episodes of undernutrition or poor health conditions.

Vulnerability

The presence of factors that place people at risk of becoming food insecure or malnourished, including those factors that affect their ability to cope.

Vulnerable group

A group of people with common characteristics, a high proportion of whom are food insecure or at risk of becoming food insecure.

Wasting

Low weight for height, generally the result of weight loss associated with a recent period of starvation or disease.

² P. Shetty. 2002. *Measures of nutritional status from anthropometric survey data*. Keynote paper for the International Scientific Symposium on Measurement and Assessment of Food Deprivation and Undernutrition. FAO, Rome, June 26-28, 2002.

Symposium Programme

WEDNESDAY JUNE 26, 2002

8:30 *Coffee and Registration*

9:00 **Welcome and Symposium Overview**

9:15 – 1:00 **Presentation of Keynote Papers**

10:30 – 11:00 *Coffee break*

Chair: **H. DE HAEN**

FAO methodology for estimating the prevalence of undernourishment
L. NAIKEN

The use of household expenditure surveys for the assessment of food insecurity
L. SMITH

Individual food intake survey methods
A. FERRO-LUZZI

Measures of nutritional status from anthropometric survey data
P. SHETTY

Qualitative measures of food insecurity and hunger
E. KENNEDY

1:00 – 2:30 *Lunch*

2:30 – 3:30 **Synthesis Paper**

Measuring hunger and malnutrition
J. MASON

Chair: H. KASNAKOGLU

Discussant: S.R. OSMANI

3:30 – 4:00 *Coffee break*

4:00 – 6:00 **Parallel Discussion Groups on Keynote Papers**

FAO Method

Chair

S. SHAPOURI

Discussion openers

I. DAVID AND B. SENAUER

Rapporteur

S. BROCA

Household Expenditure Surveys

Chair

J. P. HABICHT

Discussion openers

A. TRICHOPOULOU AND

S. LENCE

Rapporteur

J. SCHMIDHUBER

Individual Food Intake Surveys

Chair

W. WILLETT

Discussion openers

J. DE VRIES AND L. LISSNER

Rapporteur

M.C. DOP

Anthropometric Surveys

Chair M. DE ONIS
Discussion openers P. SVEDBERG AND S. KLASSEN
Rapporteur G. KENNEDY

Qualitative Measures

Chair K. RADIMER
Discussion openers H. JENSEN AND S. DEVEREUX
Rapporteur S. KENNEDY

THURSDAY JUNE 27, 2002

9:00 Coffee

9:00 – 13:00 **Parallel Contributed Papers Sessions**

Session 1: Statistical Issues Related to Improving Estimates of Distributions for Any of the Five Methods

Chair: **H. Kasnakoglu**

9:30	P. Svedberg	Fallacies in - and ways of improving - the FAO methodology for estimating prevalence of undernutrition
10:00	S. Gabbert, J.A.B. Sidique, H.P. Weikard	Risk-adjusted measures of undernourishment for sub-Saharan African countries
11:00	D. Aduayom, L. Smith	Estimating undernourishment with household expenditure surveys: A comparison of methods using data from three sub-Saharan African countries
11:30	A.K. Srivastava, A. Rai, V. Ramasubramian	On reliability of estimates of inequality in distributions derived from sample survey data
12:00	G. Arbia	A note on the effect of sampling design on the reliability of the sample variance in the estimation of food inadequacy

Session 2: Innovative Methods to Measure Food Security

Chair: M. Villarreal

- | | | |
|-------|--|---|
| 9:30 | S. Rosen,
S. Shapouri | Measuring access to food in developing countries: the case of Latin America |
| 10:00 | S. Hales, T. Blakely,
C. Kieft, A. Woodward | Prediction of the spatial distribution of under-nutrition within and between countries: an empirical statistical method using demographic and health survey data |
| 11:00 | H.V. Kuhnlein, S.
Smitasiri, S. Yesudas, S.
Ahmed, G. Kothari, L.
Bhattacharjee, L.
Dan, Z. Fengying | Documenting traditional food systems of indigenous peoples: process and methods with international case studies |
| 11:30 | L. Bhattacharjee, G.
Kothari, V.
Ramaswamy, H.
Kuhnlein, B.K.
Nandi | Traditional food patterns and dietary intake of Bhil tribes in the Dang district of Gujarat, Western India |
| 12:00 | K. Ogden, S.
Montembault,
C. Wilkinson, M.T.
Ververs | The relevance of a spatial and integrated analysis of underlying causes of malnutrition to inform NGO decision-making: The experience of <i>Action Contre la Faim</i> |

Session 3: Food Security Information Systems Using Combined Methods

Chair: M. Immink

- | | | |
|-------|--|---|
| 9:30 | D. Wiesmann | An international nutrition index: concept and analyses of food insecurity and undernutrition at country levels |
| 10:00 | M.W. Bloem,
L. Kiess,
R. Moench-Pfanner,
S. de Pee, H.
Torlesse, M. Sari
and S. Kosen | Nutrition surveillance to monitor nutrition and food security: indicators, interpretations and action |
| 11:00 | A. Trichopoulou
and DAFNE | The use of household budget survey data for assessing food disparities within and between populations – case studies of 13 European countries |
| 11:30 | J. Gladwin | Using anthropometric data: case study of a nutrition management information system in Ethiopia |

Session 4: Food Security Measurement – Discrepancies and Definitions

Chair: **B. Burlingame**

9:30	M. Nubé	Food energy deficiency, child nutrition and low BMI in adults: differences and anomalies between Africa and Asia
10:00	S. Klasen	Malnourished and surviving in South Asia, better nourished and dying young in Africa: What can explain this puzzle?
11:00	K. Jacobs, D. Sumner	Measuring national food security: prevalence of undernutrition and an index of national food security
11:30	A.B. Jahari	Nutritional status assessment method
12:00	G. Gill	Reducing hunger or malnutrition? The case of Bangladesh

Session 5: Experiences in Using Qualitative Methods for Measuring Food Security

Chair: **D. Wilcock**

9:30	M. Nord, A.K. Satpathy, N. Raj, P. Webb, R. Houser	Comparing household survey-based measures of food insecurity across countries: case studies in India, Uganda, and Bangladesh
10:00	P. Webb, J. Coates, R. Houser	Challenges in defining “direct measures” of hunger and food insecurity for Bangladesh: preliminary findings from ongoing fieldwork
11:00	J. Seaman	Household economy approaches in sub-national and national decision-making
11:30	E. Frongillo, S. Nanama	Development and validation of a questionnaire-based tool to measure rural household food insecurity in Burkina Faso
12:00	J. Hoddinott, Y. Yohannes (presented by P. Bonnard)	Dietary diversity as a food security indicator

1:00- 2:30 *Lunch*

2:30 – 6:30 **Plenary Session**

2:30 – 3:30 **Presentation of Rapporteurs’ Reports from Keynote papers**
Chair: **K. TONTISIRIN**

3:30 –4:00 *Coffee break*

4:00 – 4:30 **Summary of Consultation on Human Energy Requirements**
Chair: **P. SHETTY**
Presenter: **R. WEISELL**

4:30 – 6:30 **Open Discussion Including Keynote Speakers’ Panel**
Chair: **W. MEYERS**

7:30 **Dinner at Orazio Restaurant**
Speaker: **P. MATLON**

FRIDAY JUNE 28, 2002

8:30 *Coffee*

9:00 – 5:00 **National and International Users' Perspectives**

Chair: **S.R. JOHNSON**

Rapporteur: **J. VERCUEIL**

9:00 **Panel 1: National Users**

Kenya

J. OWOUR

India

S.S. DUBEY

Colombia

L. FAJARDO

Technical Agency working at
national level – WFP

R. BHATIA and
A. CONTE

10:30 *Coffee break*

11:00 Technical Agency working at
national level – UNICEF

F. SIBANDA-MULDER

11:20 Open Discussion Panel 1

12:20 Synthesis and Conclusions
Panel 1

CHAIR and RAPPORTEUR

1:00 *Lunch*

2:30 **Panel 2: International Users**

MDG Perspective

D. WILCOCK

World Bank Perspective

S. PATEL

DFID Perspective

T. HARRIS

USAID Perspective

A. MUKURIA and

T. MARCHIONE

3:30 Open Discussion Panel 2

4:00 *Coffee break*

4:30 Synthesis and Conclusions
Panel 2

CHAIR and RAPPORTEUR

5:00 **Where do we go from here?**

Opening statement: H. DE HAEN

Panel Response: L. SMITH, A. FERRO-LUZZI, E. KENNEDY,
J. MASON, S.R. OSMANI

Closing remarks: H. DE HAEN

6:00 End of Symposium

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Siddiqur R. Osmani, Professor, University of Ulster, UK

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