

*Review article*

# Nutritional surveillance in rural tropical countries: an integrated concept

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## Abstract

All human beings have to ingest food to get the nutrition. The epidemiology of nutritional problem is quite different in different part of the world. Most of the problematic cases come from the underdeveloped tropical countries. Of several methods, nutritional surveillance adding to the standard nutritional promotion should be used. Not only the basic medical and nutritional science but also other sciences should be integrated into a complete nutritional surveillance. Applied new technology especially for the medical informatics should be used. The multidisciplinary project between medical science workers and other non-medical science workers is also recommended.

**Keywords:** nutritional; surveillance; integrated

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## NUTRITIONAL SURVEILLANCE

### Why to?

Food is one of the four important requirements for all human beings to live: food, dress, house and drug. All human beings have to ingest food to get the nutrition. Mainly, the five groups of food corresponding to nutritional components are documented. Carbohydrate, protein, lipid, mineral and vitamin are the five important essential nutrients. There are many disorders that relate to the nutritional disorder, which can be lack and excess. It can be seen that the nutritional disorder is common in tropical developing countries. The most affected group of populations is the infantile and young children. There are several reasons for this finding. These small children are unable to find food for themselves. Therefore, they must depend on their parents. In many cases, the poverty of the family makes their parent find insufficient food for them. However, their parents can but they malpractice to feed their children in a wrong way.

The epidemiology of nutritional problem is quite

different in different part of the world. Most of the problematic cases group into the underdeveloped tropical countries. For examples, the reported prevalence in Thai Cambodia border<sup>[1]</sup>, Ibadan Nigeria<sup>[2]</sup> and Blantyre Malawi<sup>[3]</sup> are equal to 63.2 %, 33 % and 40 %, respectively. The etiology of malnutrition is complex involving interactions of multiple determinants that include biological, cultural and socioeconomic influences. The nutritional deficiency due to the poverty and low education can be expected. It should be noted that malnutrition, in any of its forms, contributes for more than 50 % of deaths among children under 5 years in those developing countries<sup>[4]</sup>, therefore, it is necessary to cope with this specific condition. Of several methods, nutritional surveillance adding to the standard nutritional promotion should be used<sup>[5]</sup>.

### Whom to?

As previously mentioned, the nutrition is necessary for everyone and strongly important for the development in early days of human life, therefore, a strict follow up and management of nutrition is needed. In pediatrics, nutrition is a very important consideration. Adequate nutrition is highly required for chil-

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dren to get their success in physical and cognition development. The focus target population for nutritional surveillance is usually the children due to the importance of nutrition in the age group as previously mentioned<sup>[5]</sup>. Nutritional surveillance is included as an important activity in well baby clinic around the world.

However, there are also other important groups that nutritional surveillance should be used. The first group to be referred is the pregnant. Because the pregnant woman has to feed her fetus therefore nutritional supplementation to this group is necessary. It should be noted that any nutritional disorders of pregnant woman can be usually affected the fetus in utero<sup>[6]</sup>. Therefore, it is also recommended to perform the nutritional surveillance among the pregnant<sup>[6]</sup>. The second group is the elderly. The situation is similar to the pediatric group, the elderly usually get illness, physical limitation and disability, and they are hardly to find sufficient food for themselves. Many elders have to be taken care by their sons or daughters. If no good care is given, the elders tends to get nutritional problems. Therefore, the nutritional surveillance is also useful for this group<sup>[7]</sup>.

### How to?

In the fieldwork, the basic tools for surveillance of the nutritional health of the population in the community are physical examination, anthropometry and nutritional record<sup>[5, 8, 9]</sup>. Anthropometry should include body weight, body height, skin-fold thickness, mid-arm circumference and hand-grip dynamometry. The physical examination is a rough tool to diagnose the nutritional problems. A high degree of suspicion, a thorough history and physical examination, and pertinent laboratory data can identify patients at risk. The anthropometry is an important tool for classification of the nutritional status of the surveyed population. Many anthropometric parameters are available and can be adapted for usage in the field survey<sup>[5, 10]</sup>. At least, height, weight, skinfold thickness, waist and hip circumference should be measured in anthropometric studies. It is recommended that the complex parameters, which require spe-

cial technique as well as the complicated laboratory investigations, should be avoided for the rural setting where the facilities are lack. Last but not least the nutritional record is an effective tool to allow the surveyor to get the data of the consumption of the community. Although the complete nutritional status survey is hard to perform but the cost is low and provide several useful data<sup>[5]</sup>.

In addition to the host factor, etiology factor, as food, due to the basic principle of epidemiology should also be surveyed. Although the food survey is not familiarize to general practitioner, it gives useful data. The food record can help us estimate that the focused population get adequate nutrition or not. It also reflect the eating practice of the population which might pose other problem such as poor sanitation or rooted wrong traditional belief. However, the important point for the food record is the reliability. The big problem is that this system is the retrospective study. The participant might give false information or incomplete information. The active food survey as to collect the sample and analyze the composition is also needed.

### NEW INTEGRATED CONCEPT

Not only the basic medical and nutritional science but also other sciences should be integrated into a complete nutritional surveillance. Applied new technology especially for the medical informatics should be used. The geospatial analysis of the information can help predict and plan for a large scale policy<sup>[11]</sup>.

It should be noted that an important determinant for success in each nutritional surveillance program is the cooperation from the participants (Figure 1). The community approach by both scientific and social method should be set before the real surveillance work. In addition, in order to promote the successful program, the additional health promotion including health education, nutritional supplementation and vaccination for the infectious diseases that can affect the pediatric nutrition should be considered<sup>[5]</sup>. The multidisciplinary project between medical science workers and other non-medical science workers is also recommended<sup>[5]</sup>.



Figure 1 Setting up community participation.

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