2

Concepts and purpose of KAP surveys

2.1 Terminology

Information on KAP is captured using questions and is stated in terms of indicators. To understand KAP surveys, you must be familiar with the following terminology.

- **Indicator:** Specific aspects of KAP to be measured. In this manual, indicators are mainly stated in terms of numbers, percentages or scores and are used to describe general trends concerning the KAP of a population or to measure changes that occur after an intervention.

- **Question:** Instrument to collect information about an indicator.

- **Outcome:** Specific measurable result of an intervention. This refers to changes in KAP identified by comparing values of indicators from before and after the intervention was introduced.

- **Participant population:** Population that will participate in the intervention.

- **Survey population**: Population that will participate in the KAP surveys. Depending on the circumstances, the survey population can be the entire participant population or a sample of it.

- **Respondent:** An individual from the survey population who responds to the KAP survey questionnaire (also referred to as an informant).

- **Surveyor/interviewer/enumerator:** A trained individual who conducts interviews with respondents of the survey population and fills out the KAP survey questionnaire.

- **Survey manager/supervisor:** An individual responsible of preparing, managing and conducting KAP surveys. He/she forms teams or groups, develops schedules for the teams and provides itineraries for them, including roadmaps, names of villages, phone numbers and other information that might be useful. He/she is also responsible for checking that questionnaires are filled out correctly and annotations are legible, for analysing the collected data and writing the final report.

- **Survey team:** Survey managers and surveyors who work together on the same survey.

- **Planner:** A project planner who analyses the nutrition situation with a view to planning a project or intervention.

- **Evaluator:** A project manager or external evaluator who evaluates the outcomes of nutrition interventions/projects.

2.2 Purpose

KAP studies emerged in the 1950s from the need to measure opposition to family planning services (14). Since then, they have been used extensively in family planning and population studies to evaluate and guide existing programmes, and their use has extended to other areas of health, including nutrition.

Nutrition-related KAP studies assess and explore peoples' KAP relating to nutrition, diet, foods and closely related hygiene and health issues. KAP studies have been used for two main purposes: (1) to collect key information during a situation analysis, which can then feed into the design of nutrition interventions and (2) to evaluate nutrition education interventions (Figure 1).

FIGURE 1: **Situation analysis and outcome evaluation**
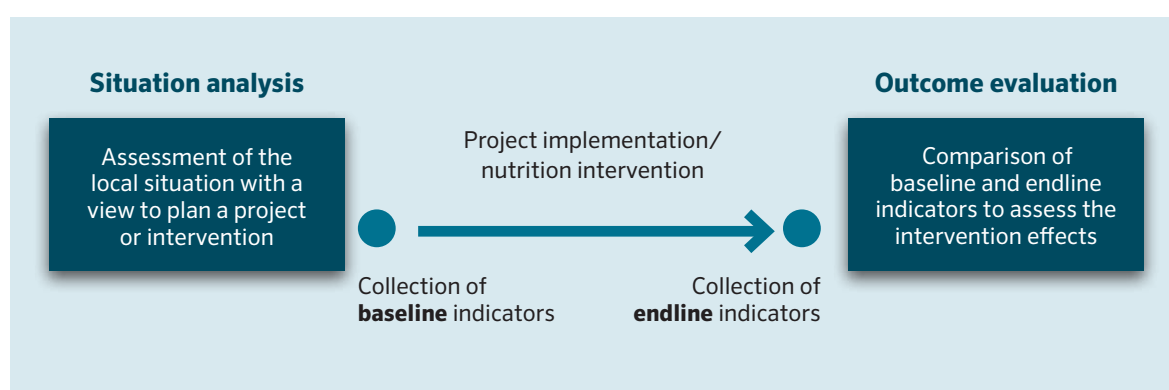
Situation analysis for intervention planning

In the context of nutrition-related projects or programmes, a situation analysis describes the type and magnitude of nutrition issues and identifies possible causes of the nutritional problems observed. The findings of a situation analysis will help in planning a nutrition intervention aimed at alleviating the nutrition problems identified.

KAP studies can contribute to a situation analysis by helping determine the existing knowledge, attitudes and practices relating to nutrition, which identifies nutrition education priorities. The steps involved are as follows (1–18):

- **"What we've got":**
  - » Identify local nutrition problems through secondary sources (e.g. national health statistics). *Prioritize the nutrition issues* that are most amenable to educational means.
  - » *Identify people's dietary practices* that are underlying the nutrition problems.
  - » Identify intrapersonal determinants of these practices, such as nutrition-related *knowledge and attitudes*.

- **"What we need":**
  - » *Identify gaps* in people's knowledge, attitudes and dietary practices.
  - » *Identify priority needs* in nutrition education with a view to informing project or intervention design.

> *Note: A situation analysis is different from a baseline survey. A situation analysis has a planning function and is conducted during the project planning phase, whereas a baseline survey is part of monitoring and evaluation of the project or intervention and is conducted at the beginning of the implementation phase.*

Outcome evaluation

Monitoring and evaluation are an essential part of project or intervention implementation and management, helping ensure that the project or intervention is on track and achieving its intended outcomes. They also allow project managers to demonstrate to funding agencies, participants and local stakeholders that project funds were well spent and that goals were achieved.

An outcome evaluation is an assessment conducted at the end of a project and provides information about the outcomes of the intervention (15, 19). It also demonstrates the intervention's effectiveness by comparing levels of indicators before and after the project or intervention was implemented.

Evaluations of nutrition interventions often focus on the long-term effects or impacts of the interventions. These are expressed in terms of biochemical and clinical indicators of nutritional status (for example, haemoglobin levels) and indicators of growth in children, including wasting (being too thin for one's height), stunting (being too short for one's age) and underweight (being too thin for one's age). These long-term indicators do not detect intermediate outcomes and must therefore be supplemented by indicators of short- and medium-term outcomes. Short-term outcomes are immediate results of an intervention, such as changes in knowledge and prevailing attitudes (15, 20). Medium-term outcomes are apparent only after a more extended period and commonly result in changes in behaviour (i.e. practices).

In contrast to indicators of physiological and health outcomes, these are social, psychological and behavioural outcomes, and are thus particularly relevant to monitoring the impact of nutrition education (19, 21) (Table 1).

> *Note: Assessing nutrition-related knowledge, attitudes and practices offers an opportunity to better understand a given situation by providing insights into the social, psychological and behavioral determinants of nutritional status.*

TABLE 1:

Examples of short-, medium- and long-term outcomes of nutrition interventions that include an educational component

Short-term outcomes	Medium-term outcomes	Long-term outcomes (impact)
Social, psychological and behavioural outcomes		Physiological and health outcomes*
Changes in intrapersonal determinants of practices Knowledge and attitudes, among others	**Changes in nutrition-related practices**	**Changes in physiological parameters** Nutritional status and biochemical indicators
Knowledge • Increased understanding of the benefits of breastfeeding • Increased knowledge of reasons for feeding young children with thick porridge rather than watery porridge • Increased awareness of the consequences of short-term hunger at school • Increased knowledge of ways to prevent food poisoning **Attitudes** • Increased confidence in being able to prepare and enriched porridge (self-efficacy/confidence) • Increased belief in benefits of dietary diversity (perceived benefits) • Increased preference for targeted foods (food preference) • Greater readiness to wash one's hands before eating (readiness to change)	• Increased intake of iron-rich foods among pregnant women • Increased meal frequency among young children • Increased dietary diversity • Decreased consumption of soft drinks • Greater use of iodized salt	• Increased haemoglobin levels among women • Decreased stunting rates in children • Decreased underweight rates among infants • Increased weight gain among pregnant women (*Note*: In food security projects or programmes, impacts refer to changes in household food insecurity, household hunger, household expenditure, wealth index and similar measures)

* The long-term outcomes (i.e. impact or physiological and health outcomes) should only be evaluated several months or even years after the completion of the programme because long-term effects take time to manifest.

> *Note: The boundary between short- and medium-term outcomes is less distinct than that between medium-term and long-term outcomes. For example, some aspects of the dietary behaviour can change immediately after a nutrition education intervention.*

2.3   Key indicators: knowledge, attitudes and practices

Knowledge

Definition of knowledge

Knowledge is the understanding of any given topic (8). In this manual, it refers to an individual's understanding of nutrition, including the intellectual ability to remember and recall food- and nutrition-related terminology, specific pieces of information and facts.

Measurement of knowledge

Partially categorized questions

Partially categorized questions are open-ended questions that require respondents to provide short answers in their own words, accompanied by a list of correct answers plus the options "Other" and "Don't know." Predefined options make analysis easier by listing expected responses. After the surveyor has asked the question, he/she should write down the response provided and then categorize it according to the predefined response options.

> *Note: The respondent may not give the response exactly as it is written in the questionnaire. It is up to the surveyor to understand the **meaning** of the responses given and tick the closest answer in the list.*

Knowledge questions can have a single answer or several answers.

Example of question with a single answer

At what age should babies start eating foods in addition to breastmilk?

_____

_____

☐ *At six months*

☐ *Other*

☐ *Don't know*

> **Preliminary analysis**
> ☐ Knows
> ☐ Does not know

Example of question with several possible answers

There are key moments when you need to wash your hands to prevent germs from reaching food.

What are these key moments?

_____

_____

☐ *After going to the toilet/latrine*

☐ *After cleaning a baby's bottom/changing a baby's nappy*

☐ *Before preparing/handling food*

☐ *Before feeding a child/eating*

☐ *After handling raw food*

☐ *After handling garbage*

☐ *Other*

☐ *Don't know*

| **Preliminary analysis** |
| ☐ Knows |
| ☐ Does not know |
| Number of correct responses _____ |

Preliminary analysis

A box is provided to allow the surveyor to make a preliminary analysis of the responses to knowledge questions. If the question has a single correct answer, the options are "Knows" or "Does not know." If the question has several correct answers, the options are "Knows" (if the respondent gives one, some or all possible correct answers), "Does not know" (if the respondent gives no correct answers) and "Number of correct responses" (to indicate the number of correct answers provided).

The surveyor can make the preliminary analysis during the interview if he/she has the requisite analytical skills. If, however, the surveyor is unable to perform this analysis, the supervisor should do it based on the surveyor's notes, cross-checking with the surveyor if necessary.

Other types of questions

Knowledge can also be measured through multiple choice questions and true/false questions. We do not recommend these types of questions because the responses can be the result of guessing and therefore give a false impression of knowledge.

Indicators used to quantify knowledge

Indicators of knowledge can be reported in terms of numbers, percentages or scores.

Number

Examples of numerical indicators include:

- number of respondents who know the correct answer to a question;
- number of respondents who do not know the correct answer to a question;
- number of respondents who know all of the correct answers to a question; and
- number of respondents who know three correct answers to a question, two correct answers and so on.

Percentage

Percentages used as indicators of knowledge are determined from the numerical indicators. For example:

- percentage of respondents who know the correct answer to a question;
- percentage of respondents who do not know the correct answer to a question;
- percentage of respondents who know all of the correct answers to a question; and
- percentage of respondents who know three correct answers to a question, two correct answers and so on.

Score

For a score-based indicator of knowledge, each respondent is given a score based on the number of correct responses provided. The knowledge score of the population is calculated for each question by dividing the total number of correct responses by the number of respondents who answered the particular question. Exclude respondents who did not answer the question, or for whom information is incomplete.

$$\text{Score of knowledge per question} = \frac{\text{Sum of correct responses given by all respondents}}{\text{Total number of respondents}}$$

Attitudes

Definition of attitudes

Attitudes are emotional, motivational, perceptive and cognitive beliefs that positively or negatively influence the behaviour or practice of an individual (16, 22). An individual's feeding or eating behaviour is influenced by his/her emotions, motivations, perceptions and thoughts (23). Attitudes influence future behaviour no matter the individual's knowledge and help explain why an individual adopts one practice and not other alternatives (10). The terms attitude, beliefs and perceptions are interchangeable.

Measurement of attitudes

Attitudes are measured by asking the respondents to judge whether they are positively or negatively inclined towards:

- a health or nutrition problem;
- an ideal or desired nutrition-related practice;
- following nutrition recommendations or food-based dietary guidelines;
- food preferences; or
- food taboos.

The respondent is asked to rate his/her answer on a three- or five-point scale (see "Box 1: Attitudes – three or five-point scale?"), called a Likert scale (8, 14–16, 23, 24). This method is used for grading the intensity of respondents' attitudes. This can be done orally or with a visual support (see Appendix 1, page 69) so as to help respondents with little education.

We recommend the use of attitude questions offering three response options:

- one positive;
- a "middle option" that captures attitudes that are still uncertain; and
- one negative.

Open-ended questions can be added in order to gain understanding of why respondents gave a specific answer; these are optional and are only relevant to a situation analysis.

Questions in the modules that are aimed at measuring attitudes were developed based on the Health Belief Model.[1] According to this model, people's beliefs influence their health-related actions (15, 25, 26). It states that the likelihood that an individual will take action to prevent a health problem depends on the individual's perception of the condition's severity and his/her likelihood of getting it, on the benefits of and barriers to taking action to reduce the risk of getting the condition and on his/her confidence in taking action. Additional variables related to food consumption and food taboos were also included as attitudes. The definitions of the attitude indicators are presented below and their measurement is illustrated in the form of scaled questions.

Attitudes towards a health or nutrition problem

When measuring both perceived susceptibility and severity, you should specify:

- the health or nutrition problem of interest; and
- the population related to this problem.

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[1] A health behaviour model is commonly used in health programmes to understand and explain human behaviour and factors that influence it, as well as to promote behaviour change. It can also be used as a basis for developing questions for measuring dietary knowledge and attitudes (25). The Health Belief Model was selected as its variables are easily measurable through survey questions; other models use variables that require the use of qualitative methods.

Perceived susceptibility

Perceived susceptibility refers to an individual's beliefs regarding his/her own or other's vulnerability to a health or nutrition problem.

Example: Measuring the perceived susceptibility to iron deficiency/anaemia

How likely do you think you are to be iron-deficient/anaemic?

☐ 1. Not likely

☐ 2. You're not sure

☐ 3. Likely

If Not likely:

Can you tell me the reason why it is not likely?

_____

_____

Perceived severity

Perceived severity refers to an individual's beliefs regarding the severity of a health or nutrition problem.

Example: Measuring the perceived severity of signs of severe malnutrition

How serious do you think undernutrition is for a baby's health?

☐ 1. Not serious

☐ 2. You're not sure

☐ 3. Serious

If Not serious:

Can you tell me the reason why it is not serious?

_____

_____

BOX 1
Attitudes – three or five-point scale?

The modules in this manual use a three-point scale because pre-testing showed it was easier to measure attitudes with a three-point scale than with a five-point scale. Respondents with little education felt confused by the five-point scale, i.e. by having to select among five different options. If you are dealing with better educated participants, you could modify the questions to use the five-point scale, but you would then need to pre-test the questions before using them in a survey.

Attitudes towards an ideal nutrition-related practice
Perceived benefits

Perceived benefits refer to an individual's beliefs regarding the benefits he/she or someone else would gain from a practice.

Example: Measuring perceived benefits of giving different types of food to a child each day

How good do you think it is to give different types of food to your child each day?

☐ 1. Not good

☐ 2. You're not sure

☐ 3. Good

If Not good:
Can you tell me the reasons why it is not good?

_____

_____

Perceived barriers

Perceived barriers reflect an individual's beliefs regarding the difficulties arising from engaging in a practice.

Example: Measuring perceived barriers to breastfeeding

How difficult is it for you to breastfeed your baby exclusively for six months?

☐ 1. Not difficult

☐ 2. So-so

☐ 3. Difficult

If Difficult:
Can you tell me the reasons why it is difficult?

_____

_____

Self-confidence

Self-confidence refers to an individual's beliefs regarding his or her own ability to perform a practice or his or her confidence in doing so.

Example: Measuring a mother's self-confidence in preparing enriched porridge for her child

How confident do you feel in preparing food for your child?

☐ 1. Not confident

☐ 2. Ok/so-so

☐ 3. Confident

If Not confident:

Can you tell me the reasons why you do not feel confident?

_____

_____

Readiness to change (optional)

You can assess a respondent's readiness to adopt a new or ideal nutrition-related practice using the Transtheoretical Model of Behaviour Change (15, 26, 27). This evaluates changes in self-reported behaviour (practice) and progress towards achieving the ideal behaviour.

Appendix 2 (page 70) provides further information on how to measure readiness to change in nutrition-related KAP studies.

Attitudes towards following nutrition recommendations or food-based dietary guidelines

Perceived importance of following a nutrition recommendation

This addresses beliefs concerning the importance of following a nutrition recommendation, advice or message delivered through nutrition education or included in food-based dietary guidelines (FBDG) (28). This indicator can help establish a link between FBDG and changes in dietary behaviour.

Example: Measuring attitude towards the Guatemala Food Guide

How important is it to follow the Guatemala Food Guide?

☐ 1. Not important

☐ 2. You're not sure

☐ 3. Important

If Not important:

Can you tell me the reasons why it is not important?

_____

_____

FIGURE 2: **Guatemala Food Guide**

SUGARS AND FATS

at least once a week
MEAT, FISH

at least once a week
DAIRY PRODUCTS

every day
HERBS,
VEGETABLES

FRUITS

every day
PULSES,
CEREALS,
AND POTATOES

SOURCE: 29.

**In order to stay healthy, wash your hands,
and cover your food and drinking water**

How important is it to follow the recommendation to consume dairy products at least twice a week?

☐ 1. Not important

☐ 2. You're not sure

☐ 3. Important

If Not important:
Can you tell me the reasons why it is not important?

_____

_____

Attitudes towards food preferences

Food preferences should be assessed if one of the aims of the survey is to assess the acceptability of a specific food or meal. Food preferences are defined as sensory-affective responses to a food or flavour that influence food choice and dietary practices (15). Food preferences are often assessed to determine if food items would be accepted before promoting them or to assess changes in preference or enjoyment of foods promoted during an intervention.

Example: Measuring liking for the flavour of soybeans

How much do you like the flavour of soybeans?

☐ 1. Dislike

☐ 2. Not sure

☐ 3. Like

Attitudes towards food taboos

Food taboos are dietary rules in a given culture, society or community that prescribe or proscribe certain food items or uses (30, 31). Food taboos are often associated with special events or phases of the human life cycle, such as illness, menstruation, pregnancy, childbirth, lactation, weddings, funerals, battles, etc. Many taboos concern the consumption of animal-source foods, often by those groups of the community most in need of protein (32). For example, in the Mid-Western Region of Nigeria, meat and eggs are not usually given to children because parents believe it will make the children steal (33). Liver is also commonly taboo for children because it is believed to cause abscesses in their lungs.

Food taboos can be assessed by evaluating the level of agreement with them. This assumes that survey managers have at least some idea of what taboos already exist in the population. Researchers can obtain information about local food taboos from previous studies of food taboos in the region or country. If no such studies are available, the project will have to identify food taboos before conducting the KAP survey; it can do this by using qualitative methods with a small group of the participant population (for example, during the situation analysis). Appendix 8 (page 178) provides basic information about methods for collecting and analysing qualitative data.

Only food taboos that could negatively affect nutritional status need be assessed, as these are the only ones that need to be modified.

Example: Assessing a food taboo against lactating women consuming beans

> Some people believe that it is not good for a lactating woman to eat beans because it might cause her to produce low-quality breastmilk that could be harmful to the baby. Do you disagree with this belief, you're not sure or do you agree?
>
> ☐ 1. Disagree
>
> ☐ 2. Not sure/neutral
>
> ☐ 3. Agree

Indicators used to quantify attitudes

Indicators used to quantify attitudes can be reported in terms of numbers, percentages or scores.

Number

Examples of numerical indicators of attitudes include:

- number of respondents who think that their child is likely to become underweight (perceived susceptibility);
- number of respondents who think that their child is not likely to become underweight (perceived susceptibility);
- number of respondents who believe that oedema of both feet is a serious problem for a baby's health (perceived severity);

- number of respondents who are not sure that adding fish to a baby's meal is good (perceived benefits);
- number of respondents who think that breastfeeding their child is difficult or somewhat difficult (perceived barriers); and
- number of respondents who feel confident in preparing an enriched porridge for their child (perceived self-efficacy).

Percentage

Percentages used as indicators of attitudes are determined from the numerical indicators. For example:

- percentage of respondents who think that their child is likely to become underweight (perceived susceptibility);
- percentage of respondents who think that their child is not likely to become underweight (perceived susceptibility);
- percentage of respondents who believe that oedema of both feet is a serious problem for a baby's health (perceived severity);
- percentage of respondents who are not sure that adding fish to a baby's meal is good (perceived benefits);
- percentage of respondents who think that breastfeeding their child is difficult or somewhat difficult (perceived barriers); and
- percentage of respondents who feel confident in preparing an enriched porridge for their child (perceived self-efficacy).

Score

For a score-based indicator of attitude, a numerical value or score is assigned to each choice in the range of responses. For example, if a question uses a five-point scale, a score of 1 might be given to "strongly disagree", 2 to "disagree", 3 to "don't know", 4 to "agree" and 5 to "strongly agree". The attitude score of the population is calculated for each question by dividing the total score for all participants who answered the question by the number of respondents who answered the question. Exclude respondents who did not answer the question, or for whom information is incomplete.

$$\text{Score of attitude per question} = \frac{\text{Sum of the scores of all respondents}}{\text{Total number of respondents}}$$

Health and nutrition-related attitudes

Attitudes towards a health or nutrition problem	
Perceived susceptibility	Beliefs regarding own or other's vulnerability to a health or nutrition problem
Perceived severity	Beliefs regarding the severity of a health or nutrition problem
Attitudes towards an ideal nutrition-related practice	
Perceived benefits	Beliefs regarding the benefits an individual would gain from a practice
Perceived barriers	Beliefs regarding the difficulties arising from engaging in a practice
Self-confidence	Beliefs regarding own ability to perform a practice or confidence in doing so
Readiness to change	Readiness to adopt a new or ideal nutrition-related practice
Attitudes towards following nutrition recommendations or food-based dietary guidelines	
Perceived importance of following a nutrition recommendation	Beliefs concerning the importance of following a nutrition recommendation, advice or message delivered through nutrition education or included in a food-based dietary guideline
Other attitudes	
Food preferences	Sensory-affective responses to a food or flavour that influence food choice and dietary practices
Attitudes towards food taboos	Level of agreement with a food taboo that could negatively affect nutritional status

Practices

Definition of practices

In this manual, the term "practices" is defined as the observable actions of an individual that could affect his/her or others' nutrition, such as eating, feeding, washing hands, cooking and selecting foods.

Practice and behaviour are interchangeable terms, although practice has a connotation of long-standing or commonly practiced behaviour (15).

Measurement of practices and indicators used to quantify them

This manual presents methods to assess nutrition-related practices in terms of:

- dietary diversity (quality of the whole diet)
- intake of specific foods
- frequency of intake of specific foods and
- specific observable behaviours.

Table 3 (page 25) summarizes the different measurements used to quantify practices and their specific uses.

Dietary diversity

Dietary diversity is a characteristic of the quality of the diet (34). Although dietary diversity is not a practice *per se*, it reflects the food consumption of individuals and is a proxy for the macro- and micronutrient adequacy of the diet. Dietary diversity must be assessed if an intervention aims to improve nutrition by increasing dietary diversity.

Assessing dietary diversity in adults

Dietary diversity in adults is assessed by administering a dietary diversity questionnaire (34). This is a rapid, user-friendly and easily administered low-cost assessment tool that consists of a simple count of food groups that an individual has consumed over the preceding 24 hours. The indicator of dietary diversity, the dietary diversity score (DDS), is calculated by summing the number of food groups consumed by the individual respondent over the 24-hour recall period.

> **Note**: *There are no established cut-off points in terms of number of food groups to indicate adequate or inadequate dietary diversity in adults. Rather, it is recommended that the mean score be used to assess changes in the diet before and after an intervention. In other words, DDSs in adults are better suited for outcome evaluation than situation analysis. Nevertheless, diets with four or more food groups tend to be nutritionally acceptable.*

Assessing dietary diversity in young children (6–23 months)

In this manual, dietary diversity of young children is assessed using a food consumption questionnaire (Appendix6, Module 2: Feeding young children (6-23 months), page 89). This is an alternate method to the 24 hour recall to collect information on food groups consumed; it records consumption of seven food groups (13). The minimum dietary diversity indicator is calculated as the percentage of children aged 6-23 months who receive foods from four or more food groups.

$$\text{Minimum dietary diversity indicator} = \frac{\text{Number of children aged 6–23 months who received food from four or more food groups during the previous day}}{\text{Number of children aged 6–23 months}} \times 100$$

Breastmilk is not included among the food groups; this indicator reflects the quality of the complementary food diet.

Twenty-four-hour dietary recalls may not be practical in community or field settings (35, 36). Food-intake checklists, short food-frequency questionnaires and nutrition behaviour checklists are sufficient to find out about food practices of a population. They are also rapid, easy to administer and less expensive than 24-hour-recall surveys (15, 37, 38). Such approaches reduce response burden while being practical, straightforward and more targeted to the specific objectives of the survey.

Intake of specific foods

Measurement: Short food-intake checklists

A food-intake checklist is a simplification of the 24-hour dietary recall approach; it asks whether a particular food or list of foods was consumed the previous day (24 hours), with the answer being a simple yes or no (28). Short food-intake checklists focus on available food sources of the nutrient of interest and must be tailored to the survey population in order to accurately assess usual intake. For example, if we would like to assess the intake of vitamin-A-rich fruits, we should prepare a short food-intake checklist of locally available vitamin-A-rich fruits.

Yesterday, during the day and night, did you consume any [**food item**]*?*

[food item] ☐ Yes**.......** ☐ No

Example: Measuring intake of foods from the vitamin A-rich fruits group

I would like to ask you about particular foods you may eat on their own or as part of a dish.

Yesterday, during the day and night, did you consume any of the following foods?

(Read the list of vitamin-A-rich foods and tick yes or no for each food item)?

Ripe mango or juice of ripe mango?   ☐ Yes ☐ No

Cantaloupe or juice of cantaloupe?   ☐ Yes ☐ No

Apricot or juice of apricot?   ☐ Yes ☐ No

> **Note***: It is important to ask about the food item in all its forms; for example a fruit can be consumed as an item or in juice.*

Indicators of intake of specific food items or food groups

Indicators of food intake are reported in terms of number or percentage of respondents consuming specific food items or food groups the previous day.

Number

Examples of numerical indicators include:

- number of respondents who consumed meat the previous day;
- number of respondents who consumed at least one vitamin-A-rich fruit the previous day; and
- number of respondents who consumed more than three iron-rich vegetables the previous day.

Percentage

Percentages are determined from the numerical indicators. For example:

- percentage of respondents who consumed meat the previous day;
- percentage of respondents who consumed at least one vitamin-A-rich fruit the previous day; and
- percentage of respondents who consumed more than three iron-rich vegetables the previous day.

Frequency of intake of specific foods

Measurement: Short food-frequency questionnaires

Usual frequency of intake of a specific food over a period of time is generally measured with a food-frequency questionnaire (FFQ) (39). Respondents are asked to report frequency of consumption of a particular food or list of foods in the past day (24 hours) or other period of time (e.g. the last three days).

> Yesterday, during the day and night [**or other time period**], did you consume [**food item**]?
>
> **[food item]**   ☐ Yes........ If yes, how many times?
>
> ☐ No

> **Note***: FFQs tend to overestimate intakes and therefore do not provide a reliable estimate of actual intake. They are better used to compare intakes before and after an intervention (15, 28). In other words, FFQs are better suited to outcome evaluation than situation analysis.*

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Use of visual supports, such as visual attitude scales or pictures of food, can help respondents understand and answer questions.

Indicator of frequency of intake of specific foods

The number of times a respondent consumes a specific food over a specific time period constitutes the respondent's individual score.

To calculate the frequency of intake of a specific food for the population as a whole, divide the number of times all respondents reported consuming the food by the total number of respondents.

$$\text{Food frequency score per food item} = \frac{\text{Total number of times all respondents reported consuming specific food item}}{\text{Total number of respondents}}$$

Specific observable behaviours or practices

Measurement: Nutrition-behaviour checklist: yes/no questions and partially categorized questions

Some practices are relevant for nutrition but cannot be assessed by measuring food intake (for instance, cleaning dirty surfaces, using iodized salt or adding a specific food item to a meal). These cannot be assessed using 24-hour recalls, short food-intake checklists or FFQs (28, 35, 36, 40). They can, however, be measured using a nutrition-behaviour checklist that employs:

- yes/no questions related to a practice and/or
- partially categorized questions accompanied by a list of statements related to practices (see "2.3. Key indicators: knowledge, attitudes and practices," "Measurement of knowledge," page 8).

Example: Measuring practices related to house treatment of water

Do you treat your water in any way to make it safe to drink?

☐ Yes

☐ No

☐ Don't know/no answer

If Yes:

What do you usually do to the water to make it safer to drink?

☐ *Boil it*

☐ *Add bleach/chlorine*

☐ *Strain it through a cloth*

☐ *Use a water filter (ceramic, sand, composite, etc.)*

☐ *Use solar disinfection*

☐ *Let it stand and settle*

☐ *Other*

☐ *Don't know/no answer*

Anything else? (*Record all items mentioned*)

_____

_____

Assessing observable practices does not aim at measuring amounts of food items consumed but rather at identifying dietary habits of the population (41). Assessing observable practices is therefore suitable for a situation analysis. From an outcome-evaluation perspective, this kind of assessment establishes whether the messages provided to the participant population have been put into practice. For example, Latin American food-based dietary guidelines (FBDG) provide the following messages: consume less salt, drink more water, eat more fruits and vegetables every day. A survey can assess whether people are applying these practices by asking a series of yes/no questions followed by open-ended partially categorized questions.

Example: Message: decrease your salt consumption

Do you do anything to decrease your salt consumption?

☐ Yes

☐ No

☐ Don't know/no answer

If Yes:

What exactly do you do?

Probe if necessary: How exactly do you decrease your salt consumption?

_____

_____

[Insert a list of the most common responses cited during pre-testing, such as the following]

☐ I cook with less salt

☐ I add less salt to my food

☐ I keep the salt-shaker far from the kitchen table

☐ Don't know/no answer

Regardless of the practice, most respondents will answer "yes." It is therefore important to encourage respondents to explain their specific practices with their own words by asking open-ended questions. You should create a list of options based on the most common responses provided by respondents during the pre-testing of the survey questionnaire; this will simplify analysis of the responses. See "Pre-testing the survey questionnaire," page 42, for more information on how to pre-test the survey questionnaire.

TABLE 3:
Approaches used to measure dietary diversity, intake of specific foods, frequency of intake of specific foods and specific observable behaviours and the purposes for which they are used

	Dietary diversity	Intake of specific foods	Frequency of intake of specific foods	Specific observable behaviours
How is it measured?	• **Adults**: 24-hour dietary recall; DDS • **Children**: FFQ; Minimum DDS	Short food-intake checklists	Short FFQ; FFQ score	Nutrition-behaviour checklists
What does it measure?	Quality of the diet	Intake of specific foods over a specific period (usually 24 hours)	Frequency of intake of specific foods over a specific period	Observable dietary practices of the survey population
For what purpose?	**Situation analysis:** • **Young children:** Consumption of four or more food groups during the previous day reflects adequate dietary diversity of the population • **Adults:** There are no established cut-off points in terms of number of food groups to indicate adequate or inadequate dietary diversity. DDS in adults should therefore not be used for situation analysis **Outcome evaluation:** Comparing DDS before and after intervention indicates changes in the dietary quality resulting from the intervention	**Situation analysis:** To determine which food items are consumed by the participant population **Outcome evaluation:** Comparing consumption of specific food items before and after the intervention indicates whether efforts made to increase consumption in the participant population were effective	**Outcome evaluation:** FFQs tend to overestimate intakes and therefore do not provide estimate of actual intake. Comparing intakes before and after an intervention indicates whether the intervention has succeeded in modifying food consumption	**Situation analysis:** To identify dietary habits of the population **Outcome evaluation:** Comparing behaviours before and after the intervention indicates whether efforts to change dietary practices have been successful

DDS = dietary diversity score; FFQ = food-frequency questionnaire.

Indicators for specific observable behaviours or practices

Indicators for specific observable behaviours or practices can be reported in terms of numbers, or percentages.

Number

Examples of numerical indicators include:

- number of respondents who treat water to make it safer to drink;
- number of respondents who do not treat water to make it safer to drink;
- number of respondents who boil water to make it safer to drink; and
- number of respondents who cook with less salt.

Percentage

Percentages are determined from the numerical indicators. For example:

- percentage of respondents who treat water to make it safer to drink;
- percentage of respondents who do not treat water to make it safer to drink;
- percentage of respondents who boil water to make it safer to drink; and
- percentage of respondents who cook with less salt.