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Analysing the data and reporting the results

It is the role of the supervisor to arrange for data cleaning, data entry and analysis.

4.1 Cleaning and entering the data

Cleaning the data

Before analysing the survey questionnaires, it is important to verify that they do not contain errors, omissions or incongruous data. After surveyors have handed in all the survey questionnaires, ideally at the end of each day, supervisors should:

- check each completed survey questionnaire for answers that are incomplete or unclear (e.g. no answer or two answers for one question);
- check that written responses are legible;
- verify there are no aberrant responses (e.g. 1850 as a birth date);
- ask the surveyors for clarification if necessary; and
- check the preliminary analysis boxes and make sure that the options ticked correspond to the response.

If the supervisor finds that important information is missing from a survey questionnaire, or has any concerns or doubts about responses to questions, he/she should first check with the surveyor and if necessary arrange for the surveyor to contact the respondent for clarification or to repeat the interview.

Entering the data

After the data have been cleaned, create a form for entering all the data. This is usually done on a computer, using database management and analysis software (e.g. Epi-Info, STATA) or spreadsheet applications (e.g. Excel). One or two people can perform this process, depending on the length of the survey questionnaire and the number of respondents. Consider the use of assistants experienced in data entry for entering the data into the form. It will be important to verify that the data are correctly entered and analysed to validate the accuracy of results by carrying out double data entry to avoid data entry error.

4.2 Analysing and using the results

Sociodemographic characteristics

The sociodemographic data collected should clearly describe the profile of the respondents in terms of age, sex, parity (for women), area of residency and so forth. This will help put the survey results in context. If the sample size is large enough, the analysis can be performed by population subgroup, such as age, sex or area of residency.

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 targeted at addressing the nutrition problems encountered.

Situation analysis in terms of knowledge, attitudes and practices

One of FAO's key recommendations for improving nutrition through agriculture is to incorporate nutrition promotion and education around food and sustainable food systems that builds on existing local knowledge, attitudes and practices.

KAP studies can contribute to a situation analysis by helping determine nutrition-education priorities. Conducting a situation analysis in terms of KAP and planning a nutrition-education intervention, for example, can be broken down into steps to characterize the current situation and steps to identify nutrition-related KAP problems and to determine the best course of action to address those problems (15–18).

Assessing the current situation

The first step is to identify and describe the present nutrition situation.

- Identify local nutrition problems through secondary sources (e.g. national health statistics).
- Prioritize the nutrition issues that are most likely to be resolved through education.
- Identify people's dietary practices that are underlying the nutrition problems.
- Identify individual-level determinants of these practices, such as nutrition-related knowledge and attitudes.

Identifying nutrition-related KAP problems and possible solutions

This step involves identifying nutrition-related KAP problems and interventions that could be used to address these, including nutrition-education interventions.

- Identify poor dietary practices and gaps in people’s knowledge and attitudes.
- Identify priority needs in nutrition education with a view to informing project or intervention design.
- Indicate educational objectives based on the information collected and the identified priority needs in nutrition education.
- Plan the content and activities of educational sessions to meet the objectives.

Gaps in people’s knowledge are identified by comparing the percentage of people who gave the correct answer(s) to a question with that of people who did not know the answer(s). Gaps in practices are identified by comparing the percentage of people employing an optimal or desired practice with that of people who do not. Gaps in attitudes are determined by comparing the percentage of people who gave the desired or positive response with the percentage who gave a negative or noncommittal response.

Table 5 shows the suggested threshold levels that would recommend the need for intervention to address the problems identified.

TABLE 5:
Suggested threshold levels indicating the need for a nutrition-education intervention

Nutrition education strategy	Percentage of “correct answers”, “optimal practices” or “desired/positive attitudes” in survey population
is urgent	≤ 70
should be considered	71–89
is not needed or difficult to justify	≥ 90

SOURCE: Peter Glasauer, personal communication.

Appendix 7 (page 175) outlines possible nutrition-education strategies that could be used to address KAP-related problems identified by a survey. The choice of strategy should be guided by specific educational objectives.

Exploring KAP in depth: use of qualitative methods

Questionnaire-based KAP surveys do not provide an in-depth understanding of a population’s diet-related KAP because they gather only quantitative descriptive information and identify general trends (16, 46). Qualitative methods can be used, if needed, to further explore the results obtained through a KAP survey and generate a more in-depth understanding of the issues identified.

For example, a KAP survey might find that 60 percent of caregivers find it difficult to prepare an enriched porridge for young children, but that 95 percent of them think doing so is beneficial. In this situation, a qualitative study could explore the specific difficulties encountered by caregivers in preparing enriched porridge and how these could be overcome.

The short, open-ended questions included in attitudes questions in the modules can provide some insight into the reasons behind the attitudes observed, but a specific qualitative study would generate more information.

Appendix 8 (page 178) provides basic information about methods for collecting and analysing qualitative data.

Broader situation analysis: taking social and environmental factors into account

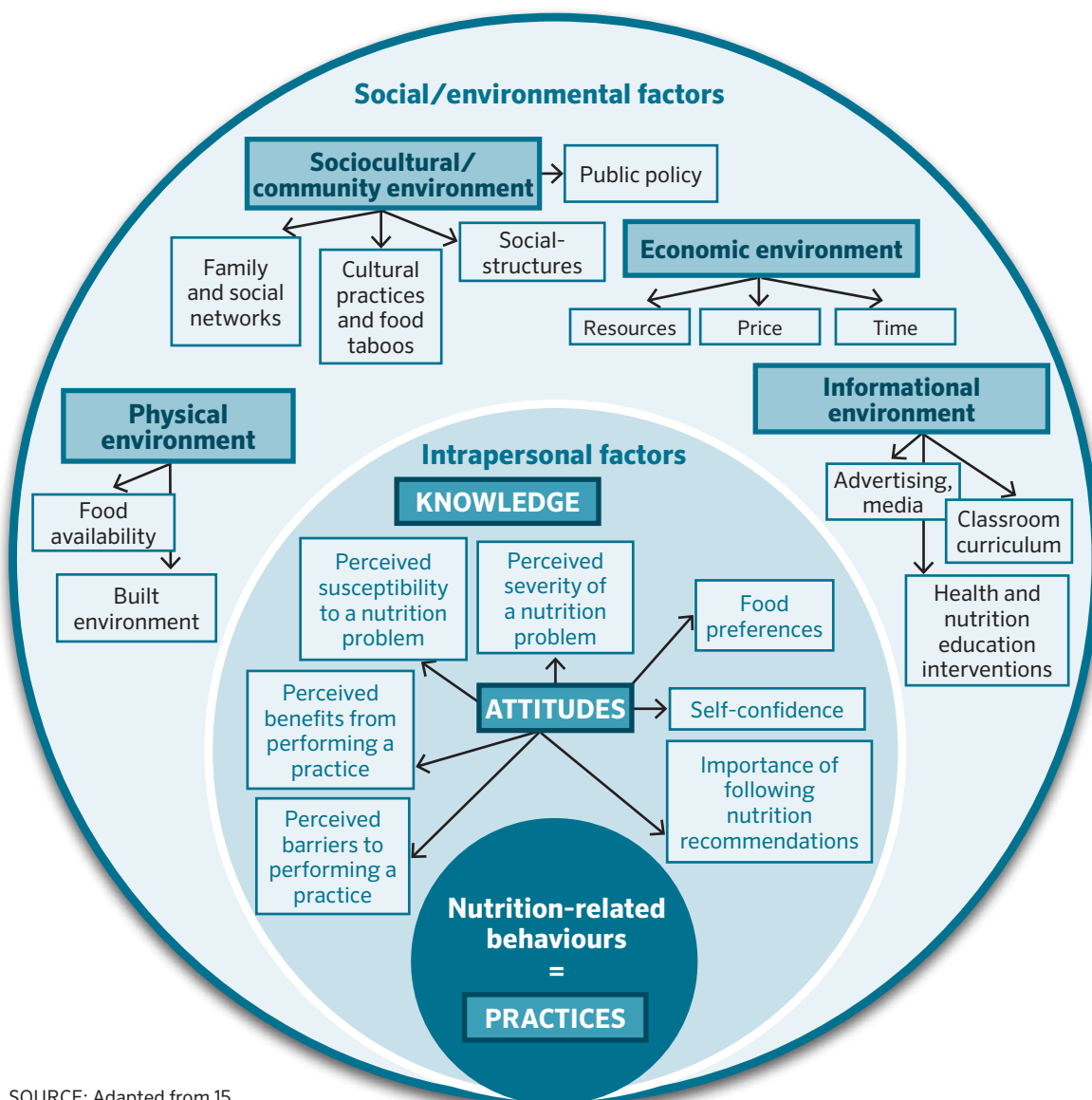
Having information about peoples' diet and health-related KAP is not sufficient for a comprehensive understanding of nutrition issues, as the information relates only to the factors inherent in an individual (or group of people). If the aim is to obtain a more comprehensive understanding of the nutrition situation in an area or a country, you will need to explore the context in which the person or group functions, i.e. factors external to the person or group that affect their KAP (15, 45, 47). Figure 4 illustrates some of the wider social and environmental factors that influence people's diets and health.

Older theories and "common sense" often assume that health and nutrition-related problems, such as malnutrition, are mainly the result of lack of knowledge. This leads to the belief that an increase in people's knowledge would result in a modification in attitudes, which in turn will bring about new or improved practices. However, scientific evidence for the link between knowledge and practice is weak; this linear KAP model is considered insufficient for explaining human behaviour (15, 22, 46, 48-50). The progression from knowledge to changed attitudes and improved practices not only depends on the assimilation of information and accumulation of knowledge but also on other factors, including:

- the physical environment: food availability and built environment;
- the sociocultural environment: family and social networks (including intrahousehold interactions and decision-making), cultural practices, social structures and public policies;
- the economic environment: resources, prices and time; and
- the informational environment: advertising and mass media.

Information on these factors will help provide a broader picture of the nutrition situation and important influences on it. These can then be taken into account in the design of the project or intervention by, for instance, identifying other strategies to be pursued, such as influencing nutrition policies or changing the food environment.

FIGURE 4: Social, environmental and intrapersonal factors affecting practices



SOURCE: Adapted from 15.

Outcome evaluation

KAP surveys can be used in an outcome evaluation to measure changes in people’s KAP in response to a specific intervention. To do this, surveys must be conducted both pre- and post-intervention. The difference between the two indicates the impact of the intervention. Changes in KAP are assessed by assessing changes in indicators: numbers, percentages or scores or for each question. This can be done in two steps:

1. Determine indicators for each question before the start of activities of the project (baseline, pre-intervention) and at the end of the project (endline, post-intervention). (For details about how to determine indicators see page 8 for knowledge, page 10 for attitudes and page 18 for practices.)

2. Compare baseline and endline values. This provides quantitative evidence of change that has occurred since the beginning of the project or intervention. Depending on the scientific rigor required of the survey, it may be necessary to conduct statistical analyses of the data to determine confidence intervals and *p*-values.

Examples of outcomes

- Improvement in practices targeted in the intervention. For example: the percentage of the survey population consuming vitamin-A-rich vegetables increases from 20 percent at baseline to 60 percent at endline.
- Increase in the proportion of the survey population engaging in practices targeted by the intervention. For example, the percentage of mothers adding fish to their baby's porridge increases by 50 percent, from 30 percent at baseline to 45 percent at endline; or the percentage of adults in the survey population washing their hands with clean water increases from 20 percent at baseline to 65 percent at endline.

Indicators of KAP may also be included in the monitoring framework of a project to monitor progress of the intervention.

Important

- ✓ **Use the same questionnaire during both the baseline and the endline survey.** This is essential to render the results comparable.
- ✓ **Calculate statistical significance.** If scientific rigor is required of the survey, conduct statistical analyses to determine whether changes in KAP are statistically significant, i.e. to see whether changes are the result of the intervention or simply the result of chance. These analyses can be expressed in terms of confidence intervals and *p*-values. Consult a statistician if needed.
- ✓ **Assess sustainability.** A series of surveys over time is more valuable than a "once-only" survey (14). To assess if outcomes are truly sustainable, conduct the outcome evaluation months or even years after the project intervention has been completed.

4.3 Putting the results into context

Initial data analysis can provide a good description of the issues at hand, their magnitude, the groups affected and other aspects of interest. However, before it is possible to draw valid conclusions from the data on KAP of the population studied, the results of the descriptive statistical analysis must be examined in the context in which the data were collected. This is necessary because any survey has methodological limitations that must be explored in order to determine whether they may have affected the results. This is called data interpretation.

Table 6 shows factors that can affect the results of a survey or study. These should be taken into account and reported as part of the analysis of the survey data.

TABLE 6:

Factors that affect the results of a survey or study used in a situation analysis or outcome evaluation

	Situation analysis	Outcome evaluation
Contextual factors of the interview	X	X
Selection of the survey population	X	X
Loss-to-follow-up		X
Outcome evaluation with and without comparison population		X

Contextual factors of the interview

In interpreting results, it is important to take into consideration the interaction between the respondent and the surveyor and contextual factors that may have affected the responses. This will help to put the results into context and provide explanations for them.

For example, as a matter of courtesy, a respondent may try to please the surveyor and say what they think she/he would like to hear, instead of answering the questions truthfully (16, 28, 48). This is a particularly significant problem in cultures that emphasize the value of not being confrontational (48) and can considerably diminish the validity of results. In analysing the results, pay particular attention to any possible influence the surveyor may have had on the behaviours or responses of participants. This is called reflexivity.

The context of the interview – for example, where it was conducted or who else was present – can affect the answers a respondent gives. The characteristics of the surveyor (age, sex, social status, etc.) can also affect the respondent's answers (14). In presenting the results of the survey, describe the context in which the interviews took place – place, time and length of the interview, presence of other people (who exactly: family, friends, peers, others) – and state how this may have influenced the responses. List any other limitations or problems encountered and how these could have affected the results and to what extent.

Selection of the survey population

The way in which the survey population was selected can have an impact on the results of the survey (Table 7). For example, if the survey population is not representative of the participant population, the results cannot be generalized.

TABLE 7:

Sampling strategies and their impact on interpretation of survey data

Selection of the entire participant population	Random sample of the participant population	Non-probability (purposive sample)
Collecting data from the entire participant population	Random sampling of the survey population	The survey population is not selected at random, introducing risk of selection bias
<p>Interpretation:</p> <ul style="list-style-type: none"> • Situation analysis: The outcomes are very likely to reflect KAP of this population • Outcome evaluation: The outcomes represent changes in KAP of the participant population 	<p>Interpretation:</p> <ul style="list-style-type: none"> • Situation analysis: The results can be generalized to the entire target population (within the chosen statistical limits, confidence interval, etc.) • Outcome evaluation: The outcomes represent changes in KAP of the participant population that are the result of the intervention and not other factors 	<p>Interpretation:</p> <ul style="list-style-type: none"> • Situation analysis: The survey population may not be representative of the participant population. The results may not reflect the KAP of the participant population • Outcome evaluation: The differences in KAP observed over time may not be the result of changes in KAP of the participant population but of changes in the survey population (outcomes cannot be generalized)

Loss-to-follow-up

An outcome evaluation should use either the same respondents for both baseline and endline surveys or properly selected random samples to ensure that pre- and post-intervention indicators can be legitimately compared. The first option is not always possible, because respondents may not be available or may refuse to participate in the endline survey. This results in what is called a loss-to-follow-up. The loss-to-follow-up is the percentage of respondents who participated in the baseline survey but did not participate in the endline survey.

$$\text{Loss-to-follow-up} = 100 - \left(\frac{\text{Number of respondents at endline}}{\text{Number of respondents at baseline}} \times 100 \right)$$

A large loss-to-follow-up can bias the outcomes, because it means that the indicators obtained from the endline survey are not derived from the baseline respondents. The baseline and endline indicators are thus not directly comparable and thus comparing them does not provide a valid indication of changes in KAP resulting from the intervention.

Interpretation

The “5-to-20 rule” can be used to interpret the validity of outcomes (51, 52). This rule states that:

- if less than 5 percent of the baseline respondents are lost to follow-up, the loss probably results in minimal impact on the validity of outcomes; and
- if more than 20 percent of the baseline population is lost to follow-up, the loss threatens the validity of results. In this case, caution is advised in making conclusions based on the outcomes obtained.

Outcome evaluation with and without a control population

Outcome evaluation with comparison population

Ideally, the survey questionnaire should also be administered to a control or non-intervention population at baseline and post-intervention. This allows the project to assess the risk of selection bias by comparing the sociodemographic characteristics (age, sex, socio-economic status, etc.) of the participant and control populations. If these two groups are similar before the intervention, we can assume that differences in the outcomes between the two groups are attributable to the intervention. If there are differences between the two groups at baseline, determine if these differences could have influenced outcomes.

Outcome evaluation without a comparison population

If there is no control population with which to compare results, outcome evaluation cannot determine to what extent changes in KAP of the intervention population can be attributed to the project or intervention; changes may have been introduced by factors other than the intervention.

In the absence of a control population, assess and report all possible pathways that may have led to the outcomes obtained and determine if the intervention was a critical factor of change in KAP, i.e. identify plausible links between the project or intervention and the outcomes. Such analyses indicate the likelihood that changes in KAP were the result of the project or intervention, but cannot provide 100 percent certainty.

4.4 Reporting the results

The final step is to report the results and findings of the outcome evaluation or situation analysis in a concise and accessible way. The aim is to produce a report that is useful all those who may benefit from the knowledge generated, including funding agencies, local stakeholders, project planners and participants themselves.

The report should include: a cover page and title of the survey; a table of contents; an introduction; the study objectives; the methods used; the results; discussion of the results; conclusions and recommendations; references; and appendixes. Ideally, the report should be no more than 20 pages (excluding appendixes).

The content of some the key elements of the report is discussed in more detail below.

Cover page and title of survey

You may need to include the names of all institutions that participated in the project and of the donors that supported the work. Check carefully any agreements for details of requirements.

Table of contents

This is essential to guide the reader. Include lists of tables, figures and boxes.

Introduction

Background: Describe the general context, the location, the population, the country and the nutrition problem of concern. Provide a summary of the project.

Justification for the survey: Provide the reasons why the KAP study was conducted.

Objectives

Write down the objectives of the KAP survey or study using bullet points (see “Step 1: Define the survey objectives and the modules to use” page 28).

Methods

Provide information about:

- the survey team: survey manager(s) and number of surveyors
- the participant population
- the selection of the survey population and sample size
- the location (survey area) and time of survey
- the questionnaire content: modules used and how these were adapted
- pre-testing of the survey questionnaire
- training of surveyors
- data collection
- quality control
- analysis: data entry, data cleaning, software used
- limitations, problems encountered and possible biases.

Presentation of results

This is the most important section.

Sociodemographic characteristics: Describe the survey population (number of respondents, sociodemographic characteristics). This information will help give context to the survey findings. It can be reported in a table.

Main results: Report the main results of the study, relating them to the objectives of the KAP evaluation.

Discussion

Present the interpretation of the most significant results in this section, taking into account the context and limitations of the study. Acknowledge any factors that affected or may have affected the results (see “4.3 Putting the results into context,” page 57).

Situation analysis: Report the nutrition situation in terms of local nutrition problems and the local situation in terms of KAP (see “Situation analysis for intervention planning,” page 53).

Outcome evaluation: Discuss the effectiveness of the nutrition intervention as indicated by the survey findings. Report positive outcomes and provide explanations about what could have led to them (see “Outcome evaluation,” page 56). For example, if the evaluation shows that, post-intervention, more caregivers are feeding their infants with more iron-rich foods, possible explanations include an increase in production of iron-rich foods in the community or a change in practices following the intervention.

Conclusions and recommendations

Draw out your conclusions based on the results and present recommendations for future action.

Situation evaluation: Based on the findings, identify priority needs in nutrition education with a view to informing project or intervention design.

Outcome evaluation: Present the following:

- What has been achieved by the nutrition project or intervention?
- Was it successful or not and why?
- Which elements of the intervention have been successful? Which were not?
- How can future projects or interventions be improved so that they are more effective (i.e. produce more positive outcomes)?

References

List the references used, in alphabetical order according to author surname.

Appendixes

Include questionnaires and supporting documents (map of the area, calendar of local events, etc.).