***Pro*PAN: Process for the Promotion of Child Feeding**

INTRODUCTION

PURPOSE AND OVERVIEW

***Pro*PAN** is a manual aimed at Ministries of Health, non-governmental organizations, and bi-lateral and international organizations interested in improving infant and young child feeding to prevent early childhood malnutrition. It describes a step-by-step process, which begins with the quantitative identification of nutritional and dietary problems, and also with the collection of qualitative information on why these problems occur, and ends with the design of and evaluation plan for an intervention to address the problems identified.

The key distinguishing feature of ***Pro*PAN** is its comprehensiveness. It includes steps on how to collect, analyze, and integrate both quantitative and qualitative information, provides guidance on how to design an intervention, and reviews evaluation strategies. In addition, ***Pro*PAN** contains software in an EPI INFO format developed specifically for the quantitative analysis of infant and young child diets. Other unique characteristics of ***Pro*PAN** are as follows:

- It leads to the identification of specific nutritional and dietary problems.
- It allows for an understanding of the context in which these problems occur.
- It presents a method for identifying, ranking and selecting practices to promote that are practical, feasible and accepted by the community and potentially effective if adopted.
- It distinguishes between the practices that are to be promoted and recommended and the messages that are to be disseminated in an intervention.
- It provides data collection forms in an electronic format.
- It includes a module on monitoring and evaluation.
- It has a focus on Latin America and the Caribbean though is likely to be suitable for other Regions.
- It addresses essential elements necessary to design and evaluate interventions to improve breastfeeding and complementary feeding.

BACKGROUND

An important, recent advance in nutrition is the recognition that the intrauterine period and the first two years of life are when malnutrition is most common and severe, and when its adverse effects on child survival and development are of greatest concern. Women in poor areas of Latin America and the Caribbean often enter pregnancy in a compromised nutritional state, which frequently worsens as the additional demands of pregnancy are not met. As a result, intrauterine growth retardation is all too common. Infants and young children have high nutritional requirements, are highly susceptible to infections, and require special and time-consuming care. Unfortunately, many families do not have access to an adequate quantity and quality of food, basic sanitation, and health care. In many situations, these inadequacies are exacerbated by poor feeding and care practices. As a result, a large proportion of infants and young children suffer from protein-energy malnutrition and from micronutrient deficiencies, such as iron, vitamin A and zinc, resulting in marked growth failure. The consequences of malnutrition at formative stages of life place a great burden on affected individuals and on society. In the preschool years, these include poor resistance to infection, significant morbidity and mortality, and delayed mental and motor development. In the long term, consequences include deficient learning at school, impaired intellectual performance, small body size, reduced work capacity in adults, and in women, increased risk of delivery complications and of low birth weight in their children.

Recognition of the importance of adequate nutrition at the early stages of life has led to the re-orientation of many programs to focus on women during pregnancy and breastfeeding, and on their infants and young children. Improving infant and young child nutrition requires improving prenatal nutrition and care as well as feeding practices. ***Pro*PAN** focuses on improving the diet and feeding practices of infants and young children from birth to 24 months of age.

Improving breastfeeding and complementary feeding practices is a direct and effective strategy for preventing child malnutrition. There is evidence linking exclusive breastfeeding with significantly reduced incidence of diarrheal disease and respiratory infections and mortality. There is also evidence linking improvement in the dietary intakes of infants and young children, whether through efficacy or effectiveness research, with significantly better growth.

*Pro*PAN MANUAL

The ***Pro*PAN** manual consists of four modules (Figure 1). In Module I, quantitative and qualitative methods are applied to identify specific dietary problems, the practices that lead to these problems, and the context in which these problems occur. The quantitative methodologies that are used include a *General Survey, 24-hour Dietary Recall and Market Survey*. The qualitative methodologies include *Opportunistic Observation, Mothers' Semi-structured Interview and Food Attributes Exercise*. A software package is provided to aid in the analysis of the dietary data required by Module I; specifically, it serves to identify the key nutrient problems and the relative importance and cost of local foods as sources of these nutrients. Through Module I, users will be able to generate a list of potential practices and of foods and preparations that could be promoted to improve the feeding problems identified.

In Module II, users will be able to test the acceptability and feasibility of the potential practices and of foods and preparations identified in Module I through household behavior and recipe trials. The outcome of Module II will be the identification of feasible options for change, that is, practices that the community can and is willing to adopt and foods and recipes that it is willing to prepare and give to young children.

In Module III, guidelines are provided for the design of the intervention plan, to be crafted around the options selected in Module II. The steps recommended lead to the strategies, activities, materials, and messages that can promote the desired changes in practices.

Module IV involves the development of the monitoring and evaluation plan. It includes the design of indicators to monitor the impact of the intervention as well as the selection of appropriate evaluation designs. The grand outcome is, then, the joint implementation of the intervention plan and its monitoring and evaluation plan.

In ***Pro*PAN**, a series of *ideal breastfeeding and complementary feeding practices* are identified and used to guide the analysis of quantitative and qualitative feeding data (Table 1). These practices were developed from a series of recent documents on the scientific basis for optimal infant and young child feeding (WHO/UNICEF, 1998; Daelmans et al., 2003; PAHO/WHO, 2003). The definition of the ideal breastfeeding practices benefited from previous work on indicator development and the universality of their application (WHO, 1991). The definition of ideal complementary feeding practices was guided by the "Guiding Principles for Complementary Feeding of the Breastfed Child" (PAHO/WHO, 2003). When possible, operational definitions for these Principles were developed for use in ***Pro*PAN**.

The scientific information that forms the basis for the assessment of the *ideal practices* also stems from previous work (WHO, 1998; Dewey and Brown, 2003). For nutrients, the recommended daily intake and complementary food density are provided in Table 2. The recommended daily energy intake and recommended energy density of complementary foods are provided in Tables 3 and 4, respectively.

Ideal infant feeding begins with exclusive breastfeeding for 6 months and then with continued breastfeeding for two years or more and appropriate complementary feeding. ***Pro*PAN** describes methodologies for identifying problematic practices in both areas. However, because less is known in regards to promoting optimal complementary feeding than breastfeeding, ***Pro*PAN** places greater emphasis on identifying options for improving complementary feeding between 6 and 23[1] months of age than is the case for breastfeeding.

1 For the purpose of simplification, 23 months is used to indicate 23.9 months, 11 to indicate 11.9, and 8 to indicate 8.9.

Figure 1. Conceptual model of *Pro*PAN

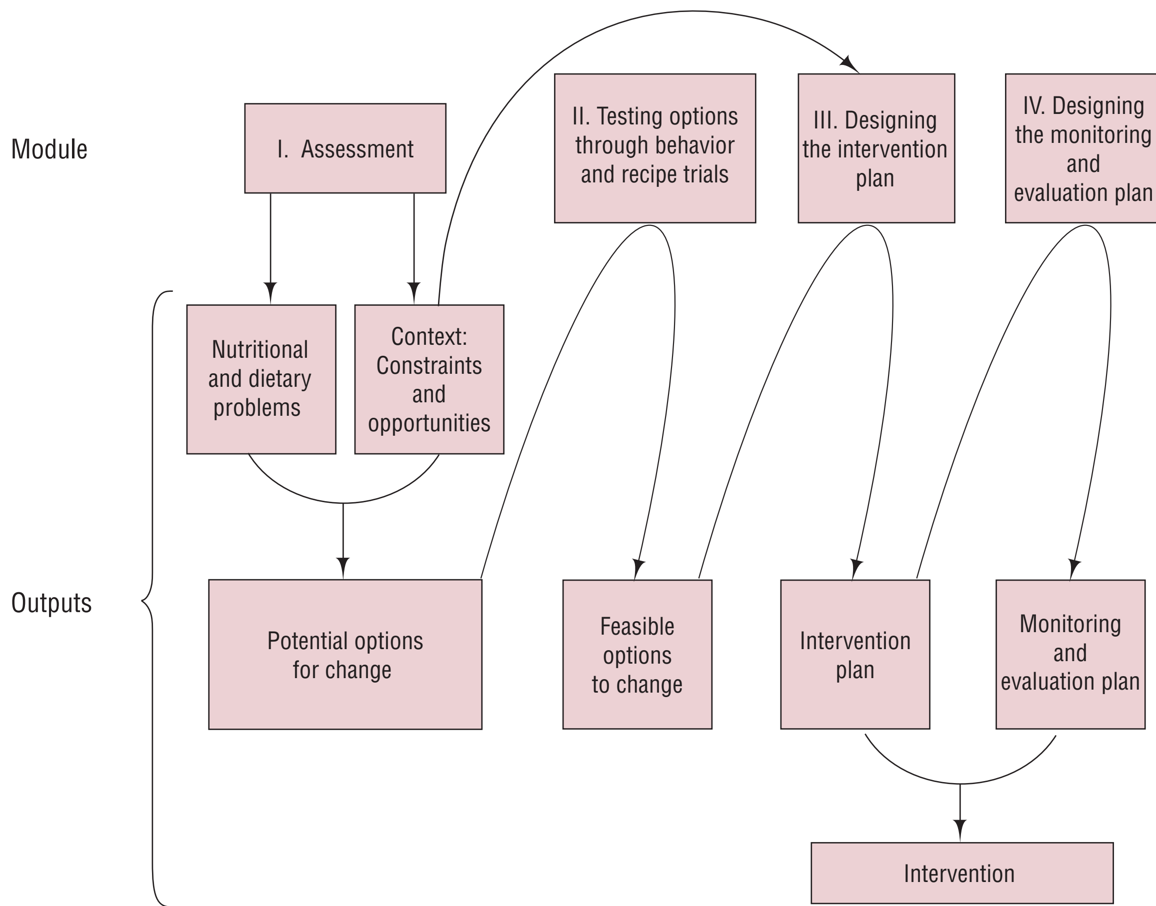

Table 1. Ideal breast feeding and complementary feeding practices

Ideal practice	Definition	Source	Calculation
1. That all infants are breastfed for the first time within the first hour after birth.	Percentage of children who were breastfed for the first time within the first hour after birth.	General Survey: How many hours after birth did you breastfeed your child for the first time?	**Numerator:** Children 6 to 23.9 months whose mothers reported breastfeeding the infant for the first time within the first hour after birth. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed.
2. That all infants are not fed with pre-lacteals.	Percentage of children who were not fed with pre-lacteals (those liquids or foods administered to the newborn before breast feeding is initiated).	General Survey: What was the first liquid or food the infant consumed after birth? If the interviewee did not answer "breast milk," the answer was classified as a pre-lacteal.	**Numerator**: Children 6 to 23.9 months whose mothers reported first feeding breast milk after birth. **Denominator**: All children 6 to 23.9 months whose mothers were interviewed.
3. That all infants are fed colostrum.	Percentage of children who were fed colostrum.	General Survey: Did you feed the child your first milk (colostrum)?	**Numerator**: Children 6 to 23.9 months whose mothers reported feeding them colostrum. **Denominator**: All children 6 to 23.9 months whose mothers were interviewed.
4. That all infants and young children are breastfed on demand, during the day and nigh..	Percentage of children who are breastfed on demand.	General Survey: Do you breastfed your child when he wants to or on a fixed schedule? If the interviewee answered "when the child wants to" the answer was classified as breastfeeding on demand.	**Numerator** Children 6 to 23.9 months whose mothers reported breastfeeding them "when the child wants to." **Denominator**: Children 6 to 23.9 months who were breastfeeding at the time of the survey and whose mothers were interviewed.

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Ideal practice	Definition	Source	Calculation
5. That all infants are exclusively breastfed until 6 months of age.	Percentage of children who consumed breast milk and no other liquids or foods before six months of age.	General Survey: At what age (in months) did you give your child liquids other than breast milk for the first time? And at what age (in months) did you give your child her first food? The age when the child received her first drink or food was considered the age when exclusive breastfeeding stopped.	**Numerator**: Children 6 to 23.9 months whose mothers reported stopping exclusively breastfeeding between 6 and 6.9 months of age. **Denominator**: All children 6 to 23.9 months whose mothers were interviewed.
6. That no children are weaned before 24 months of age.	Percentage of children who were weaned before 24 months of age.	General Survey: At what age (in months) did the child stop breastfeeding?	**Numerator**: All children 6 to 23.9 months whose mothers were interviewed. **Denominator**: All children 6 to 23.9 months whose mothers were interviewed[1].
7. That all infants are fed semi-solid complementary foods beginning at 6 months of age.	Percentage of children who began complementary feeding with semi-solid foods between 6 and 6.9 months of age. Non-compliance was considered if the child: 1) began complementary feeding with liquids or foods before 6 months of age; 2) began complementary feeding with liquids or foods after 6.9 months; or 3) began complementary feeding between 6 and 6.9 months but only with liquids.	General Survey: At what age (in months) did you give your child liquids other than breast milk for the first time? And at what age (in months) did you give your child her first food? If the interviewee answered "foods between 6 and 6.9 months" and "no liquids before 6 months" then the answer was classified as complementary feeding initiated at 6 months with semi-solid foods.	**Numerator**: Children 6 to 23.9 months whose mothers reportedinitiating complementary feeding between 6 and 6.9 months of age with semi-solid foods. **Denominator**: All children 6 to 23.9 months whose mothers were interviewed.

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1 This calculation follows the convention used in the "Indicators for assessing breast-feeding practices" (WHO, 1991). However, since children in the sample could be subsequently weaned before 24 months of age, it will not give a true prevalence of weaning.

Ideal practice	Definition	Source	Calculation
8. That all infants and young children meet their recommended daily energy requirements.	Percentage of children in the previous 24 hours who consumed the daily energy requirement from non-breast milk sources based on age and breastfeeding status. At least 50% of children must meet their energy requirement to consider this ideal practice met[2].	24-hour Dietary Recall: **Energy intake:** calculated from kilocalorie content of non-breastmilk foods and liquids consumed.	**Numerator:** Children 6 to 23.9 months whose energy intake met or surpassed their energy requirement. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed.
9. That all infants and young children are fed nutrient- and energy-dense foods.	Percentage of children whose mean nutrient and energy density from all non-breastmilk foods and liquids consumed in the previous 24 hours met or surpassed the recommended nutrient- and energy density of foods based on their age and breastfeeding status.	4-hour Dietary Recall: **Mean nutrient density:** calculated by summing nutrient intake from all non-breastmilk foods and liquids consumed and expressing the total per 100 kcals of foods and liquids consumed. **Mean energy density:** calculated by summing energy intake from all non-breastmilk foods and liquids and expressing per 1 gram of foods and liquids consumed.	**Nutrient and energy density:** **Numerator:** Children 6 to 23.9 months whose mean nutrient density (for energy, protein, iron, zinc, vitamin A, vitamin C and calcium calculated separately) met or surpassed their nutrient density recommendation. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed. This provides separate measures of density for each nutrient and for energy.

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2 Unlike recommendations for nutrients, which are set at 2 standard deviations above the average requirement to ensure that the needs of virtually all the population are met, the recommendation for energy is set at the median to discourage excess intake. Therefore, if 50% of the population meets or exceeds this requirement energy intake is considered to be adequate.

Ideal practice	Definition	Source	Calculation
10. That all infants and young children are fed the recommended number of meals daily	Percentage of children who in the previous 24 hours consumed at least this number of meals: breastfed, 6-8 months: 2 breastfed, 9-11 months: 3 breastfed, 12-23 months: 3 non-breastfed, 6-8 months: 2[3] non-breastfed, 9-11 months: 3 non-breastfed, 12-23 months:3	24-hour Dietary Recall: **Frequency:** All caregiver-defined meals (e.g. breakfast, lunch, dinner)	**Numerator:** Children 6 to 23.9 months whose feeding frequency met or surpassed their minimum frequency recommendation.. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed.
11. That all infants and young children are fed meat, fish or poultry daily	Percentage of children who ate at least one food source from meat, fish or poultry in the previous 24 hours.	24-hour Dietary Recall: **Meat, fish, poultry:** foods and liquids in the food composition table are coded as being a "meat, fish or poultry" and preparations/dishes are coded as containing "some meat, fish or poultry." If the child consumed at least one food coded as "meat, fish or poultry" or "some meat, fish or poultry," the child was classified as having consumed at least one food source from meat, fish or poultry.	**Numerator:** Children 6 to 23.9 months who consumed at least one food source from meat, fish or poultry. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed.
12. That all infants and young children are supported and motivated to eat to satiety during meal times	Percentage of children whose caregiver reported offering support and motivation to eat during meal times.	General Survey: If your child stops eating, and you think she is still hungry or did not eat enough, what do you do? The answer is classified by the Field Worker as "motivates the child" or "does not motivate the child."	**Numerator:** Children 6 to 23.9 months whose mothers reported motivating the child to eat. **Denominator:** All children 6 to 23.9 months whose mothers were interviewed.

3 WHO/UNICEF recommends that children are breastfed for two years or beyond, and ideally all children are breastfed during the target age range of ***Pro*PAN**. However, inasmuch as data show that in Latin America and the Caribbean many children are prematurely weaned, the ***Pro*PAN** software includes programs for the analysis of diets of non breastfed children. The meal frequency for non breastfed children assumes that another source of milk has completely replaced breastmilk.

Table 2. Recommended daily intake and complementary food density for nutrients, by age group and breastfeeding status

	Recommended Daily Intake		Recommended Complementary Food Density (per 100 kcal)[4,5]	
PROTEIN (g)	**Breastfed[1,2]**	**Not breastfed[3]**	**Breastfed[1]**	**Not breastfed**
6-8.9 mo	2	9.1	1.0	1.5
9-11.9 mo	3.1	9.6	1.0	1.4
12-23.9 mo	5	10.9	0.9	1.2
IRON (mg) [6]				
6-8.9 mo	10.8	11	5.3	1.8
9-11.9 mo	10.8	11	3.5	1.6
12-23.9 mo	5.8	6	1.1	0.7
ZINC (mg)				
6-8.9 mo	2.2	2.8	1.1	0.5
9-11.9 mo	2.3	2.8	0.7	0.4
12-23.9 mo	2.4	2.8	0.4	0.3
VITAMIN A (µg ER)				
6-8.9 mo	13	350	6	57
9-11.9 mo	42	350	14	51
12-23.9 mo	126	400	23	45
VITAMIN C (mg)				
6-8.9 mo	0	25	0	4.1
9-11.9 mo	0	25	0	3.6
12-23.9 mo	8	30	1.5	3.4
CALCIUM (mg)				
6-8.9 mo	336	525	166	85
9-11.9 mo	353	525	115	77
12-23.9 mo	196	350	36	39

1 Assuming average breast milk intake.

2 WHO/UNICEF (1998) (Table 26).

3 WHO/UNICEF (1998) (Table 25).

4 Nutrient density per 100 kcal calculated as follows: "daily intake requirement for nutrient" X 100 / "daily intake requirement for energy."

5 Source for daily energy requirement: Dewey and Brown (2003).

6 Assuming medium iron bioavailability.

Table 3. The recommended daily energy intake from complementary foods, by age group and breastfeeding status

	Recommended Energy Intake (kcal)[1]		Recommended Energy Intake (kcal / kg)	
	Breastfed	Not breastfed[3]	Breastfed[2, 3]	Not breastfed[3]
6-8.9 mo	202	615	25.3	77.0
9-11.9 mo	307	686	34.7	77.5
12-23.9 mo	548	894	43.3	81.3

1 Dewey y Brown, 2002. (Table 2)
2 Calculated as follows:
Ideal weight = (kcal/day recommendation for non-breastfed children) / (kcal/kg/d recommendation for non-breastfed children)
Kcal/kg recommendation = (kcal/day recommendation for breastfed kids) / ideal weight
3 Dewey y Brown, 2003. (Table 1)

Table 4. Recommended energy density of complementary foods, by age group and breastfeeding status

	Energy Density (kcal / g)	
Consuming 1 meal per day	**Breastfed[1,2]**	**Not breastfed[2,3]**
6-8.9 mo	1.43	3.09
9-11.9 mo	1.68	3.01
12-23.9 mo	2.24	3.24
Consuming 2 meals per day		
6-8.9 mo	0.71	1.54
9-11.9 mo	0.84	1.51
12-23.9 mo	1.12	1.62
Consuming 3 meals per day		
6-8.9 mo	0.48	1.03
9-11.9 mo	0.56	1.00
12-23.9 mo	0.75	1.08
Consuming 4 meals per day		
6-8.9 mo	0.36	0.77
9-11.9 mo	0.42	0.75
12-23.9 mo	0.56	0.81

1 Assuming average breast milk intake.
2 Dewey y Brown, 2003. (Table 3)
3 Calculated as follows:

Recommended energy density when consuming 1 meal per day:

$$\frac{\text{Total energy requirement + 2 SD (kcal/d)}}{\text{Gastric capacity}}$$

Recommended energy density when consuming 2 meals per day:

$$\frac{\text{Recommended energy density when consuming 1 meal per day}}{2}$$

Recommended energy density when consuming 3 meals per day:

$$\frac{\text{Recommended energy density when consuming 1 meal per day}}{3}$$

INTRODUCTION

AUDIENCE FOR *Pro*PAN

***Pro*PAN** is designed for a broad range of users. Those wishing to design a new program or to add a component about infant and young child feeding to an existing program will need to use all the modules. In cases where a program already exists, users may find specific modules to be of greater interest e.g., Module II to test the feasibility and acceptability of new recipes and practices that are to be promoted within a program and Module IV to design an evaluation where one is missing.

DEVELOPMENT AND FIELD TESTING

***Pro*PAN** was developed by a team of nutritionists, anthropologists, epidemiologists, and statisticians at the Nutrition Unit of the Pan American Health Organization (PAHO), the Rollins School of Public Health at Emory University, the National Institute of Public Health in Mexico, and the Institute for Nutrition Research in Peru. ***Pro*PAN** was developed through extensive fieldwork over a two-year period in Mexico and Peru. The final draft was field tested in Bolivia (Pachón and Reynoso, 2002). An additional field test of the software was conducted in Ecuador. Following modifications resulting from the field tests, the English translation of ***Pro*PAN** was further tested in Jamaica and the final Spanish version further tested in Brazil, Mexico, and Panama. For use in Brazil, all research instruments were translated into Portuguese. ***Pro*PAN** also benefited from an extensive review process by academicians and program managers.

The development of ***Pro*PAN** benefited from earlier manuals on aspects of infant and young child feeding. In particular, "Designing by Dialogue" by Dickin, Griffiths and Piwoz of the Academy for Educational Development and the Manoff Group (Dickin *et al*., 1997) and "Tools to Measure Performance of Nutrition Programs" (Levinson *et al*., 2000) contributed toward many of the concepts used in Modules II and IV, respectively.

In addition, many ideas, such as the *Food Attributes Exercise* and the methodologies used in the semi-structured interviews and focus groups, were borrowed from "Culture, Environment, and Food to Prevent Vitamin A Deficiency " (Kuhnlein and Pelto, 1997).

STRUCTURE OF THE *Pro*PAN MANUAL

The ***Pro*PAN** manual is structured in the following manner. It begins with a **Glossary** of the concepts, an **Introduction** to the process, background, and overview of the technical content of the manual, and the **Logistics** to follow in implementation. Subsequently, it describes the ***Pro*PAN** process in detail in four modules: (I) **Assessmen**t, (II) **Recipe creation exercise and test of recommendations**, (III) **Design of the intervention plan**, and (IV) **Monitoring and evaluation**. Each module has two parts. The first part defines the purpose, products, steps, and development of the application of the module; it also presents a brief description of the instruments and the techniques to be applied during fieldwork for the collection of the data and

its analysis. The second part presents the annexes of the module and includes the data collection forms, guidelines for their use, the matrixes for data analysis, instructions for the training of personnel, and examples of filled out forms and matrixes.

A complementary publication to this manual presents the ***Pro*PAN** software. This software can be used for entering and analyzing data from the *General Survey, 24-hour Dietary Recall*, and *Market Survey*. The software is based on the English version of Epi Info (Dean et al., 1995), a program developed by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), Atlanta, USA. The ***Pro*PAN** food composition table, embedded in the software, is used for analysis of the *24-hour Dietary Recall*.

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