



**Helen Keller International**  
*the international division of Helen Keller Worldwide*

**Micronutrient Initiative Project**

**Health Facility Assessment:  
*Nutrition and Micronutrients  
in Manica Province***

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## *Table of Contents*

<b>I. Executive Summary.....</b>	<b>3</b>
<b>II. Background.....</b>	<b>5</b>
<b>III. Methods.....</b>	<b>7</b>
<b>IV. Results .....</b>	<b>10</b>
<b>V. Discussion.....</b>	<b>18</b>
<b>VI. Recommendations.....</b>	<b>24</b>
<b>VII. References.....</b>	<b>27</b>
<b>VIII. Annex of Tables and Figures.....</b>	<b>28</b>

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## **I. Executive Summary**

### ***Introduction***

The health sector is a key entry point for nutrition services and counseling for populations at risk of malnutrition, including micronutrient deficiencies. Understanding the capacity of facilities to provide these services is therefore critical, in order to learn how facilities might be better supported, to the end of improvement of nutritional status of vulnerable populations. To this end, a study of health facilities was conducted in Manica Province to evaluate the management of nutrition and micronutrients at the facility level. The study objective was to determine nutrition-related knowledge and practices of providers and clients, and to assess facilities-related factors which constrain good delivery of services to the client population, especially of vulnerable groups, pre- and post-partum women and children under 5 years of age.

The study took place September 3 - 14, 2001 in 10 health facilities in Manica Province. Facilities were selected primarily based on representative-ness of community types (urban/peri-urban/rural), and on practicality and accessibility. The study included: a) client and provider interviews (pre-natal, post-partum and caretakers of under-5 children); b) observations of client consultations of each group; c) facilities/supplies related checklist. Eight survey instruments were used. The sample size was 326 client interviews, 190 observations, 30 provider interviews, and 10 facilities checklists. One team of 6 interviewers plus support staff performed surveys in local dialect, visiting one facility per day.

### ***Results***

The study sample reflected Mozambican age/fertility patterns, half of women were 14 to 21 years of age and 57% have attended school on average 4.15 years. The mean age of under-5 children was 18.5 months. Half live within one hour of the health facility and most traveled to the facility by foot. Average reported wait time was 81 minutes. Languages most used in households and consultations were CiTewe, Portuguese and CiBarue. Five percent of households use a language not spoken by providers and half of them (2.5%) of these speak no other language. Most (67%) providers were 'basic' level nurses and about one half were maternal/infant specialists (ESMI), with a mean of 8.8 years as health practitioners. Six of ten providers have had no nutrition-specific training other than general provider training. Most child consults were for illness, while those for women were pre or post-partum checkups.

Providers appear to lack good knowledge about malnutrition prevalences, signs/consequences and proper treatment. Nutrition related knowledge and diagnostic practices (inquiries and clinical exams) were better for iron/folate and for pre-natal women than for other nutrients or other groups. One third of providers discussed at least one micronutrient deficiency while less than 20% discussed diet with clients. Infant/child feeding and 'exclusive' breastfeeding was discussed most with post-partum women, while few discussed 'complimentary' feeding with caretakers of greater than 6 month olds. Clients expressed interest in more information on child feeding, general health/nutrition and diet during pregnancy. Providers at rural health posts, P.S. (Postos de Saude) spent fewer minutes per consult than those at C.S. (Centros de Saude) but counseled more about diet and nutrition. Two thirds of pre-natal women received iron/folate tablets, but few (20%) were counseled about side effects and a third of women who received the tablets do not intend to take them. Providers appear to have good record-keeping practices overall.

### ***Conclusions***

A number of good nutrition-related practices currently exist in surveyed health facilities which should be further encouraged. These provide a foundation upon which improvements of deficiencies, as described in this report, might be based.

It was concluded that for various reasons, nutrition management at surveyed health facilities in Manica Province is not optimal. Low levels of nutrition-specific training and knowledge, personnel shortages, inconsistent materials/supplies, supervision, and protocols, and time pressures all contribute to constrain nutrition services at the facility level. Education and poverty also likely affect delivery and comprehension of messages. Provider training/education could include: a) current malnutrition prevalence and risk estimates, b) basic knowledge of micronutrients including signs /consequences / treatment / protocols /dangers, c) quick and easy (no-lab) micronutrient malnutrition diagnostic methods, d) emphasis on iodized salt consumption, e) strong dietary focus including sources and preparation, f) concurrent treatment/prevention of malaria/worms and emphasis on good hygiene, g) emphasis on girls' education/late parity. Nutrition-specific communication/education materials could be used to emphasize messages in facility and community. Inadequacies in supplies, facilities/equipment, and supervision should be addressed at central level. Nutrition policy considerations could include: a) greater overall investment in prevention of malnutrition at the health facility level; b) iron/folate for all prenatal and post-partum women and increased awareness of reproductive-age risk; c) vitamin A for post-partum women within 8 weeks of delivery; d) national-level assessment of VAD prevalence.

## II. Background

Manica Province lies in west-central Mozambique in the foothills bordering Zimbabwe. Due to its strategic position, the province suffered immensely during the civil war which ended in 1992. Although great improvements have been made these regions still suffer from extreme poverty, malnutrition, and general food insecurity. Manica Province continues with low health indicators, in part related to increasing HIV/AIDS prevalence and related complications, including nutritional consequences<sup>1</sup>.

Manica Province varies in climate and agricultural productivity, from arid low-production regions of the north and south, to fertile highly productive central regions. Agriculture is the primary activity of the majority of the population and the main source of food for consumption. In normal years family agriculture provides the poor with food between 3-9 months per year, and is augmented by employment, small family industries such as the sale of coal or traditional drinks and food, *ganho-ganho*<sup>2</sup>, donations, or trade (3).

Early marriage and pregnancy are common, accompanied by characteristically low school attendance and high dropout rates for girls. Of pupils 15 to 18 years old in rural Manica Province only 26% are girls (4). Manica Province's poor nutritional status exemplifies the association between mother's education level and health. In Mozambique, long-term nutritional status of children was found to be better when mothers are literate, with stronger correlations if the mother completed EP2<sup>3</sup>. This positive association is especially strong in rural areas (5).

### *Health, Nutrition, and Micronutrients in Manica Province*

Growing interest in addressing micronutrient malnutrition in the province has led to the initiation of the following projects by HKI in collaboration with the provincial health department (DPS): 1) school-based iron-supplementation pilot program targeted to adolescent girls; 2) study of health facility management of nutrition and micronutrients; 3) qualitative assessment of the feasibility of community-based iron/folate delivery; and 4) multi-nutrient fortification of maize-meal, the local staple food. The goals are improved knowledge and practices related to dietary nutrition and nutritional supplements (on the part of both providers and clients/community), improved and broadened delivery of supplements, and ultimately improved nutritional health especially of vulnerable groups, women of reproductive age and under-5 year old children.

A 1998 Ministry of Health Mozambique/Helen Keller International anemia assessment in the provinces of Manica, Cabo Delgado, Gaza, and Maputo showed an anemia prevalence of 45% among woman of reproductive age in Manica Province. Iodine deficiency in Manica Province is estimated at the second highest after Cabo Delgado<sup>4</sup>, measured by urinary iodine, with 29.5% each moderately and severely deficient children (6). Assessment of Vitamin A deficiency is currently in the planning stages.

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<sup>1</sup> Manica Province has the 4th highest prevalence of malnutrition in Mozambique (1). "Malnutrition" defined as < -2 S.D. below median reference weight-for-age (2).

<sup>2</sup> *Ganho-Ganho* is a short-term coping strategy used by families during periods of urgent need. Work can be for cash or payment in kind.

<sup>3</sup> EP2 is primary school up to grade 6 or 7.

<sup>4</sup> Survey data available for 4 provinces only.

Anemic women have a higher risk of hemorrhaging during birth, having low birth-weight babies<sup>5</sup>, suffering from post-partum infection, and ultimately dying from complications related to childbirth<sup>6</sup>. Anemia during pregnancy can also result in impaired physical and cognitive development of the fetus, with long-term negative and irreversible effects on major organ systems including the immune system, and decreasing post-partum growth, strength, educability and productivity (9).

Vitamin A is necessary for the integrity of epithelial cells in the body, (especially of the eyes and gut), regeneration of visual pigments after exposure to sunlight, strength of the immune system, and growth and development. It is also thought to play an important role in iron metabolism (10), and has a well-known association with mortality (11). Like iron, vitamin A requirements are greatest during periods of rapid growth (pregnancy, adolescence, infancy and early childhood) (12).

Iodine is required for production of thyroid hormones. The thyroid regulates physical and cognitive growth and development, and is especially critical during gestation. Deficiency of iodine is associated with low-birth weight (13), reproductive impairment, decreased productivity, mental retardation and cretinism, and general growth insufficiency (14). Iodine has only environmental sources, therefore in areas without universal iodization of salt, deficiencies tend to congregate in regional/geographical patterns.

Early pregnancy in the province compounds problems associated with malnutrition as a fetus competes with a growing girl's own nutritional needs. Because each of these nutrients is related to physical and cognitive development, deficiencies can have inter-generational consequences with long-term economic and sociological effects through decreased educability and work ability. Additionally, high prevalences of malaria, intestinal worms and other illnesses in the region increase the malnutrition risk through repeated and regular infections.

Current protocol in Mozambique is supplementation of iron/folate tablets to all pregnant women through the national health service, distributed at the health facility level (15), but problems with low coverage due to supply shortages and poor compliance persist within the health facility supplementation program. Supplementation of post-partum women has yet to be included in protocol. According to protocol, pregnant and post-partum women should also receive de-worming treatment (after the 4<sup>th</sup> month of pregnancy). Malaria treatment is only given to women with malaria symptoms (or confirmed malaria, if testing facilities are available). Preventive malaria treatment of all pregnant and post-partum women has been discussed for over 10 years in the Ministry of Health, but is not included in official protocols as of yet.

For children systematic screening (pallor of palms) is part of new Integrated Management of Childhood Illness guidelines for Mozambique. These guidelines also recommend treatment of anemic children with iron in combination with anti malaria drugs and de-worming (children over 1 year of age).

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<sup>5</sup> Anemic women have normal weight babies 30-40% less frequently than non-anemic women. (7)

<sup>6</sup> Maternal Mortality Ratio in Mozambique is 1100/100,000 live births, ranking among the top 5 in the world according to available data. (8)

In February, 2002 the school-based iron/folate supplementation pilot study will begin, seeking to improve pre-pregnancy iron stores in adolescent girls and to augment the health facilities-based delivery system.

Vitamin A is currently distributed to children 6-59 months of age half-yearly through National Immunization Days (NIDS), and occasionally therapeutically. Beginning in 2002, distribution of vitamin A to under-5 year olds will be incorporated into child immunization at health facilities. New IVACG/WHO/UNICEF guidelines will be published in the near future and the Ministry of Health might consider adaptation of protocols accordingly. Iodine supplements are currently not available to at-risk groups in Manica Province. Salt iodization, the major programmatic intervention for iodine deficiency, has had varied success likely due to access problems and lack of economic resources.

In summary, this health facilities study seeks to improve the health of vulnerable groups in Manica Province through improved micronutrient-related knowledge and practices at the health facility level and decreased facilities-related constraints. Together with the school/community-based and fortification projects, it also seeks to strengthen the current health center-based system and improve coordination of micronutrient-related programming between facilities, schools, and communities.

### III. Methods

The micronutrient and nutrition management study was carried out at 10 health facilities in Manica Province from September 3-14, 2001. Facilities were chosen with the help of DPS and local NGO personnel, primarily on the basis of size, representative-ness, location and accessibility. It was desired that various sized facilities be represented from the smallest, very rural health posts to the larger urban and peri-urban facilities. For logistical reasons and limited locations and staff, no hospitals were surveyed although larger facilities from two urban areas were. These are *Manica Sede* and *Primeiro de Mayo* (Chimoio). Surveyed facilities are shown in Table A, following.

**Table A. Surveyed Health Facilities by Location and Type**

Facility Name	Location Type	Type of Facility
Primeiro de Mayo (Chimoio)	Urban	Centro de Saude (C.S.)
Manica Sede	Urban	Centro de Saude (C.S.)
Gondola C.S.	Peri-urban	Centro de Saude (C.S.)
Amatongas (Gondola)	Rural town	Posto de Saude (P.S.)
Sussundenga Sede	Rural town	Centro de Saude (C.S.)
Rotanda	Very rural	Posto de Saude (P.S.)
Machaze	Very rural	Posto de Saude (P.S.)
Guro	Rural town	Centro de Saude (C.S.)
Catandica	Rural town	Centro de Saude (C.S.)
Nhamagua	Very rural	Posto de Saude (P.S.)

Note: "Sede" refers to the district capital or 'seat'. "Centros de Saude" are generally larger, more well-staffed and equipped facilities than are "Postos de Saude".

Within each of the ten facilities, eight different survey instruments were used to collect information:

1. Observations of client consultations (three instruments):
  - a. Pre-natal women
  - b. Post-partum women
  - c. Children under 59 months of age (caretakers)
2. Interviews with clients (three instruments):
  - a. Pre-natal women
  - b. Post-partum women
  - c. Children under 59 months of age (caretakers)
3. Interviews with facility personnel (one instrument)
4. Equipment/Inventory and facility checklist (one instrument)

Survey instruments sought information relevant to provider and client knowledge of nutrition and micronutrients, provider practices relating to diagnosis and nutrition counseling, and facility-related factors such that might constrain good nutrition practice and subsequent knowledge transfer to clients. Instruments asked about issues specific to the three high-risk groups regarding nutritional knowledge and practices relevant to that group.

Sample sizes for each group were determined using practicality and sufficiency as the main requirements. A total of 326 client interviews and 190 observations were completed.<sup>7</sup> It was originally intended to compare results of observed and not-observed interviews. However, this was not possible due to identification problems between observed and not-observed groups. Sample sizes for each survey group are shown in Table B, following.

**Table B. Number of Records per Source/Group**

	<b>Pre-Natal Women</b>	<b>Post-Partum Women</b>	<b>Children Under 59 Months of Age</b>	<b>Total</b>
<b>Client Interviews</b>	129	50	147	326
<b>Observations</b>	73	39	78	190
<b>Provider Interviews</b> <sup>1</sup>	10	10	10	30
<b>Facilities</b>	<i>na</i>	<i>na</i>	<i>na</i>	10

<sup>1</sup> Questions pertaining to practices and knowledge applied to 10 providers per each group (pre-natal, post-partum and under-5 children), which in smaller facilities could be the same person. However, background information such as level of training and sex applied to only one provider per facility, usually the first provider interviewed.

<sup>7</sup> Sample size for post-partum interviews were fewer since comparatively few women return for post-partum exams.

### *Data Collection*

Client interviews were obtained by politely requesting participation upon exit from the consultation. Since the topic was not of a sensitive nature nor did it include invasive procedures, it was determined that formal permission would not be required from client respondents in the interest of efficiency. However, interviewers were instructed to respect refusal and were not to persist if a client wished not to participate. No one refused participation.

Observations were completed with one interviewer inside the consultation room to observe and note activities for each of the three groups, pre-natal, post-partum and under-5 children. Normally one observer completed all observations (or several in sequence) for a particular group to minimize the disruption of workflow and the consultations themselves. All observations of pre-natal and post-partum consultations were performed by females, although a male interviewer/observer participated in observation of child consultations.

Provider interviews were completed before, during and/or after consultations as time permitted. Equipment/facilities instruments were completed after all interviews and observations, and were requested of the director of the facility unless handed by him/her to a colleague.

Reporting of the three client groups (pre-natal, post-partum and under-5 children) lends different perspectives to the same issues/questions and allows for comparison and a resultant 'broader' picture of nutrition management within health facilities. Some amount of error and bias are inevitable, however it is hoped that using data from the three groups decreases error/bias from any one and improves interpretation of results. Incongruencies between what the client reports and what is observed may well highlight differences in client interpretations and those of trained health professionals or survey staff.

Data were analyzed using the SPSS 10.0 data package and EpiInfo version 6.4.

### *Teams*

The survey staff consisted of six interviewers (five females and one male), two supervisors and field support staff. It was originally planned to survey two facilities each day in teams of three interviewers each, with two days allotted per facility if necessary to complete interviews. During the first days in the field, it was determined more practical to travel together as one team and complete one facility per day, due to the usually large numbers of clients/consults during early morning hours and virtually none after noon. This allowed for travel time in the afternoons when interviews were not possible as well as completion of surveys in all 10 facilities within the 10 day time period.

Due to a general lack of post-partum consults in Manica Province, post-survey return trips were made to two accessible health posts in order to augment the post-partum sample sizes (both observations and client interviews). These were to Sussundenga Sede and Gondola health Centers.

### *Weaknesses*

Weaknesses and problems arise during design and data collection of every study that can potentially affect the data and interpretations. Study findings should be considered in light of the following:

- Interviewer misunderstandings/error potentially affected data and results on several issues:
  - Observed/Not-observed was incorrectly completed on client interviews, making impossible a comparison of consultations observed by survey staff and those not
  - Missing data due to:
    - a) Incomplete, inappropriate or missing answers
    - b) Difficulty with appropriate and consistent translation, or explanation to client
- The provider instrument only included background information for one provider, when questions about knowledge, practice, etc., may have applied to three distinct providers - or only to one if there was only one provider at a health post. Therefore the sample size for some provider questions is 30, and 10 for other questions. This is a potential source of confusion for data users.
- Potential provider bias due to knowledge of survey topic and/or 'accepted' practices.
- Large differences between 'observed' and 'reported' data existed at times, which could be biases on the part of the interviewer, observer or the client. Some variance of this type is normal and should be kept in mind when interpreting results.

## **IV. Results**

### **I. Background**

Survey results are shown below. Sources of data, observations or interviews, are used independently and together at times, depending on the best data for a particular question. Data sources are noted in text and tables.

#### *Client*

The mean age of women interviewed (post-partum and pre-natal), was 22.5 years with a median age of 21 years and a range of 14 – 40 (Table 1, Annex). With approximately half between the ages of 14 and 21, they reflect typical fertility practices in Mozambique. The average age of under-5 children was 18.5 months, with a median age of 14 months and range of 1-59 months. Ages for 20 women and 10 children were missing. The missing children were not included in age-related analysis (no age related analysis applies to women).

Of women interviewed, 57% reported having ever attended school (Table 1, Annex). The average number of years attending school was 4.15 and includes caretakers of under-5 children in addition to pre-natal and post-partum women.

A large range in travel times from home to the health facility was reported, between 1 – 300 minutes (Table 1, Annex). Half of women report living within an hour of the health facility (median 41 minutes), with a bit higher average time of 67 minutes. Mean reported time waiting for consultation was 81 minutes and a range of 1 – 360 minutes, although half of clients report waiting less than 1 hour (53 minutes) to be served<sup>8</sup>. The majority (85%) report traveling to the health facility by foot. Other means include chapa, bicycle and ‘other’. More than one method of transport could be reported by each respondent.

CiTewe was the language most used in respondents’ households (27%), followed closely by Portuguese (26%), and CiBarue (25%). These were also the three languages most often used during consultations (Table 2, Annex). Other languages used in the household and consultations include Ndau (19%), CiManyika (15%), and Nhyungue (6%). Fourteen percent of respondents report use of “other” languages in the household. Overall in 6% of consults more than one language was used to communicate<sup>9</sup>. Sixteen households (5% of total) report normally using languages in the household which are *not* spoken by health facility personnel, and eight of these households (2.5%) report speaking no other language (Table 3, Annex).

The reported reason for most visits by women were pre-natal or post-partum consultations, where 100% of pre-natal women and 98% of post-partum women stated this as the primary reason for visit. The majority (78%) of consults of under-5 children are for illness (Table C, following). Other reasons for child consults included growth monitoring and immunization.

**Table C.**

Reasons for Client Consultation <sup>1</sup>	Consultation/ Growth Monitoring		Illness		Child Immunization	
	<i>OBS</i>	<i>INTV</i>	<i>OBS</i>	<i>INTV</i>	<i>OBS</i>	<i>INTV</i>
	<b>Pre-Natal (n=73, 129)</b>	99%	100%	<1%	0%	<i>na</i>
<b>Post-Partum (n=39, 50)</b>	94%	98%	8% <sup>2</sup>	2%	<i>na</i>	<i>na</i>
<b>Children &lt; 59 months (n=78, 149)</b>	28%	19%	68%	78%	4%	3%

<sup>1</sup> More than one reason for visit possible per respondent.  
<sup>2</sup> for 3 out of 39 illness was a reason for consult, 1 mother and 2 children.  
*Note:* n's for Observations and Interviews in order, per group. OBS = observed; INTV = interviewed

*Provider*

The majority of health providers observed in surveyed facilities are basic level nurses (67%), 37% of these are ESMI trained, and 33% are general nurses (Table 4, Annex)<sup>10</sup>. Twenty percent of providers were trained at elementary level. Of these 13% are trained midwives, and 7% are

<sup>8</sup> Sample sizes reflect missing cases as well as the removal of unreasonably high outliers which skew the mean.

<sup>9</sup> Source: Observations

<sup>10</sup> ESMI is a nurse specially trained in maternal/child-health

nurses. Higher ‘medium’ level nurses are fewest at 10%, all ESMI trained. No medical doctors were observed serving clients at any facility during the study. There were more than twice as many ESMI nurses at Centros de Saude (C.S.) as Postos de Saude (P.S.). Providers report on average 8.8 years working as a health practitioner (median 6.0, range 1-28). Seventy percent of providers were female.

The languages spoken by providers are those most commonly used in Manica Province and generally the same as reported by clients (Table 2, Annex). Most spoken are Portuguese, Ndau and CiTewe (reported by 8, 5, and 4 of 10 providers, respectively). Providers also report speaking CiBárue, CiManyika, Nhungue and “other” languages.

A little over half of providers (6 of 10) report having received nutrition training only as part of their general training (Table 5, Annex). Four report having taken a special course/seminar in nutrition.

## II. Knowledge

To assess basic awareness of the nutritional status of the population in their region, providers were asked about malnutrition in the region where they practice. Four out of ten providers each of pre-natal and post-partum providers and 8 of 10 under-5 providers believe malnutrition is a problem in their region, (Table 6, Annex). Anemia, underweight, marasmus, and kwashiorkor were named as the most common types of malnutrition. Several providers also named illnesses such as tuberculosis, diarrhea or malaria as *types* of malnutrition. “Poverty” and “taboos”, in addition to direct causes, were also mentioned as causes of malnutrition, (i.e., lack of food and early cessation of breastfeeding).

Providers were also asked to name *signs* and *consequences* of micronutrient deficiencies. Most could name one common sign of each iron, vitamin A, and iodine deficiencies (10, 10, and 8 out of 10 respectively) (Table 7, Annex).

‘Consequences’ were included separate from ‘signs’ to pursue knowledge of more serious outcomes beyond commonly known signs and symptoms such as mortality and blindness. With the exception of iodine, most providers could name consequences which are of a more grave nature than ‘signs’. Eight of ten providers could name a ‘consequence’ of vitamin A deficiency, 7 named a consequence of iron deficiency and 7 of 10 could name a consequences of folate deficiency<sup>11</sup>. None could name a grave outcome of iodine deficiency, however 7 providers named ‘goiter’ as a consequence. This question may have been misunderstood by providers and/or interviewers, evidenced by responses such as “pallor” (or, pale skin/mucosas of the eyes) as a consequence rather than sign of iron deficiency. One respondent mentioned vitamin A deficiency provokes more illness.

Clients were also asked to name signs of common deficiencies. One third (31%) of client respondents could name one sign of iron deficiency, 8% could name one sign of vitamin A deficiency, and 2% could name a sign of iodine deficiency. Discussions of deficiencies during

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<sup>11</sup> ‘Anemia’ as a consequence of folic acid deficiency is included as correct, although the question sought more grave consequences of poor gestational outcomes.

consults were also reportedly low (Table 8, Annex). (Observers reported less discussion of deficiencies than respondents. This is discussed further in the section on provider communication).

### III. Practices Related to Nutrition and Micronutrients

#### *Information Seeking and Diagnosis Practices*

A main interest of this study is assessing practices relating to nutritional diagnosis. This was done by considering the type and number of diagnostic questions asked of a client, and relevant exams performed. Both interviews and observations are used as data sources, at times illustrating the differences in reported and observed outcomes.

On average, providers asked 3.7 relevant diagnostic questions of post-partum clients, and 2.7 and 2.6 respectively for pre-natal women and under-5 children (Table 9, Annex)<sup>12</sup>. Of post-partum consultations, 85% of providers inquired about hemorrhage, a risk association with anemia. The majority of post-partum and pre-natal women (87% and 78% respectively) were asked about 'how they feel', a basic question of health assessment. (This question did not apply to the under-5 child questionnaire). Few providers were observed to inquire about drugs or vitamins the client is currently taking, the highest at 39% for pre-natal women.

Inquiry about malaria/illnesses was especially low for pre-natal and post-partum women given the association of malaria with anemia (34% and 39% respectively). This was some better for under-5 children at 69%. Only 41% of providers asked about appetite and/or diet for under-5 children. This was higher for post-partum and pre-natal women (82% and 68% respectively). About half asked about child vaccination status. Although observers report that overall only 59% of providers inquired as to the reason for the consult, 36% of providers knew beforehand the reason. Differences in actual observed inquiries and self-reported practices varied by group and topic, some were higher in actuality while others were lower. (Table 9, Annex).

Of clinical diagnostic exams performed, fetal measurement and fetal heart rate were performed nearly always for pre-natal women (97 and 99% respectively), and in 74% of pre-natal and post-partum exams a pelvic and/or breast exam was performed (Table 10, Annex). One third of providers took post-partum women's temperature (indicative of infection), while 18% took the temperature of under-5 children. Few (6%) requested a urine exam, and only of pre-natal women.

On average, more *nutrition-relevant* exams were performed for pre-natal women (mean of 3.5), than post-partum women (mean of 2.7) or under-5 children (mean of 1.3)<sup>13</sup> (Table 10, Annex). In most cases, more pre-natal diagnostic exams were performed than for the other two groups. The highest of these for pre-natal women were blood pressure and weight, 92% and 89%, followed

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<sup>12</sup> The post-partum questionnaire included an additional question about hemorrhage, therefore the total number of questions relevant to post-partum women is 6, while 5 questions each apply to pre-natal women and under-5 children. This results in a higher average for the post-partum sample.

<sup>13</sup> Fewer questions applied to under-5 children (5) compared to pre-natal and post-partum women (7 each) which results in a lower average for the under-5 group. Source: Observations.

by mucosal exams (assessment of vitamin A deficiency, 71%). Edema, associated with high-risk pregnancy and severe anemia, was assessed in less than half of pre-natal and of post-partum consults (48% and 46% respectively). Few providers in any group inquired about night blindness (6% for children and 3% each pre- and post-partum women). One quarter of providers tested hemoglobin for pre-natal women, but only 3% did so for post-partum women and 10% for children. Providers overtly search for signs of anemia via pallor for only 4% of children, 26% and 18% respectively of pre-natal and post-partum women.

When babies were examined as part of post-partum consultations, most providers inquired about breastfeeding (87%), and problems related to breastfeeding (77%), but few (8%) inquired as to whether the mother is giving other liquids, indicative of 'exclusive' breastfeeding (Table 11, Annex). Less than half of providers (48%) inquired about infections/illnesses, and a third (33%) asked about child vaccinations.

An average of 2.0 *nutrition-relevant* exams were performed per examination of the infant during post-partum consultations. In 59% of these the infant was weighed, 41% examined the mucosae of the eyes, and 18% took the infant's temperature (Table 11, Annex).

#### *Treatment Practices*

Providers spent on average less time overall per consult at the rural health posts (*Postos de Saude*, or P.S.), than the larger central health posts (*Centros de Saude*, C.S.), at 7.0 minutes/consult vs. 8.8 minutes (Table 12, Annex). Time varied between client groups, with more time, 10.6 minutes allotted for post-partum women, 8.0 minutes for pre-natal women, and 6.7 minutes on average per child consult.

Providers were asked how they normally treat anemia and vitamin A deficiency among the three vulnerable groups of this study. Response options were not read aloud and providers were allowed to freely state practices. At the highest, 7 of 10 providers report directing pre-natal women to increase consumption of iron-rich foods. This was lower for both post-partum women and children, at 5 and 4 of 10 providers respectively (Table 13, Annex). Six of ten say they recommend dietary improvement for each pre-natal and post-partum women for vitamin A deficiency, and half for under-5 children.

More providers say they give iron/folate tablets than the other supplements, reported by 9 of 10 providers for pre-natal women and 7 of 10 for each post-natal women and children. This was reported much less for vitamin A capsules, highest 7 of 10 providers of under-5 children. Three of ten providers report giving vitamin A capsules to pre-natal women (also 3 of 10 for post-partum women), and 1 of 10 providers reported not treating vitamin A deficiency at all. Two out of ten providers each mention giving chloroquin or mebendazol, and only to children as an accompaniment to iron/folate to treat or prevent associated morbidity of worms and/or malaria among this age group.

In observed practice, respondents report 39% of providers overall gave iron/folate tablets to clients, 66% to pre-natal women, 20% of post-partum women and to 17% of under-5 children

(Table 14, Annex). Chloroquin for malaria prophylaxis or treatment were given to 47% of under-5 children, and 11% and 6% each to pre-natal or post-partum women. A few, 6.8% of all children were reported receiving vitamin A during the visit. Half (51%) of providers overall were reported to emphasize the importance of taking the drugs or prescriptions they were given that day. By group, this was highest at 67% for post-partum women and 62% for children, but much lower for pre-natal women at 39%.

For those who received iron/folate, overall providers explained to 84% the manner it should be taken. This was higher specifically for pre-natal women, 93%, but 60% each for post-partum woman and children. However, side effects of tablets were discussed in only 20% of cases, an issue especially important for iron/folate compliance. Less than half, 45% overall reported understanding why they were receiving iron/folate tablets. Clients who received iron were also asked about their willingness to take it. Of 115 recipients, 71% report they intend to take it. Reasons given by those who say they will not take iron/folate include: a) causes vomiting; b) causes nausea ('enjoada'); and c) they were worried because it was the first time to take it (Table 15, Annex).

Overall, providers were diligent in marking client health and pre-natal cards. Nearly all respondents (94% overall) report having a health card. Of observed consultations, 93% of providers marked the client health card, and 80% were recorded marking health facility records. Recording practices were generally better for pre-natal than for post-partum women or under-5 children (Table 16, Annex).

#### *Provider Communication Practices*

Results of client interviews and observations about provider communication appear similar with the exception of whether the provider asked about doubts/questions the client may have, which assesses the quality of client service and communication. In each group (pre-natal, post-partum and under-5 children), clients report a much lower percentage of attention to their doubts than do observers (16% compared to 57%) (Table 17, Annex). The greatest discrepancy was for pre-natal women with a difference of 57% between observed and reported. Of children presenting with illnesses, less than half (42%) of providers were observed to explain the nature of their illness to caregivers.

The majority of respondents, 80% overall, say they understood the *counsel* given by the provider, (versus *language*, which 97% say they understood). This is lowest for pre-natal women at 72%. Reportedly few (12%) of providers used materials (i.e., posters, albums, or flipcharts) to assist or enhance explanation of health messages to clients (Table 17, Annex).

Additionally, overall 44% of clients expressed a desire for more health information, 64% of post-partum women, 50% of caretakers of under-5 children, and 30% of pre-natal women (Table 18, Annex). The majority desired more information on child feeding, (22% overall and 36% of post-partum women), while 13% of respondents desire more information on both general health and diet during pregnancy, 9% on nutrition in general, and 8% on pregnancy. Non-pregnant women as well as pregnant women state an interest in more information on pregnancy and/or diet during pregnancy.

According to client interviews, 79% of all respondents say providers mentioned or discussed the client's nutritional status (Table 19, Annex). This was the strongest for post-partum women at 96%, while 83% of pre-natal woman and 69% of under-5 children respondents report this. Overall 19% of respondents (pre-natal and children) report that the provider discussed a nutritional diet with the client, and only 36% report that the provider discussed specifically *at least* one of the major micronutrient deficiencies - iron, vitamin A, or iodine. Of these, 25% of respondents report discussion of iron, 20% of vitamin A, and 3% of iodine. As might be expected, discussion of iron deficiency was much higher for pre-natal woman than the other two groups, while discussion of vitamin A was higher for under-5 children.

In contrast, *observers* report that providers discussed diet with a much larger proportion of clients, 44% overall and more than twice as often for pre-natal woman as under-5 children (59% and 26% respectively) (Table 19, Annex). However, observers noted much lower discussion of specific nutrient deficiencies, only 7% overall discussing at least one major micronutrient deficiency. The greatest discussion of any one nutrient observed within a particular group was iron, observed in 8% of pre-natal client consultations. Providers in 6 of 8 facilities reported doing food preparation demonstrations, however no detailed information about types of demonstrations nor their frequencies was given.

Given the special nutritional vulnerability of under-5 children, child and infant feeding practices were analyzed separately. 'Child/infant feeding' applies only to under-5 children and babies recently born to post-partum clients, while for pre-natal women this question refers to 'future' feeding practices. Missing age data is excluded from under-5 child analysis, 10 cases for client interviews and 20 for observations.

Overall discussion of child feeding and exclusive breastfeeding appeared better for post-partum women than the others. On the high end, 88% of post-partum women report discussion of child/infant feeding during consultation (Table 20, Annex). In only a few pre-natal and under-5 consults (12% each), do respondents say that infant feeding was discussed. A much greater proportion also discussed 'exclusive' breastfeeding with post-partum women than with pre-natal women or children, 70% of post-partum interviews, and very few of child or pre-natal interviews (8% and 11% respectively). There was some variability between *reported* and *observed* child feeding counseling, and observers report a greater percent of providers discussing both infant feeding (26% versus 12% reported), and exclusive breastfeeding in under-5 children less than 6 months of age (46% versus 11% reported). 'Infant feeding' was not included in the *observation* portion of the survey for pre-natal women.

Of providers who discussed infant/child feeding with clients with children 6-59 months (n=110), 12% of clients report that the provider discussed complimentary feeding, including the mention of specific foods (Table 20, Annex). This was reported to be somewhat higher by observers at 33%. In both reported and observed responses, providers most often mentioned enriching foods (i.e., cereals, soups mixed with other nutritious foods), and secondly fruits as methods to feed children over 6 months, however both of these were low. Observers reported greater discussion of complimentary foods than do clients, about twice as much for each method (10% vs. 33% observed enriched foods, and 9% vs. 31% observed fruits). Animal products (eggs, milk, meat)

were also mentioned in about one quarter of observed consults, a large difference from the 4% reported by clients.

Proportionally, more nutritional counseling and discussion of specific nutrients was reported at the smaller, more rural health posts, or P.S.' than the larger C.S.' per client interviews (Table 21, Annex). Additionally, nearly twice as many providers at the P.S. were reported to discuss diet, (62% compared with 36%) and iron, (10% compared with 5%) than providers at C.S. Clients report that vitamin A was mentioned at only 3% of interviews at the C.S. (none at P.S.). There was no discussion of iodine at either.

#### **IV. Facilities**

##### *Condition, Supplies and Equipment*

Along with client and observer data, facilities were assessed for capacity to properly manage nutrition-related health issues, in terms of supplies/equipment, water source, personnel, and support (supervision, continuing education, educational materials and proper protocols).

Of 10 facilities, only 6 had piped water inside the clinic, while the other 4 relied on public or 'other' unspecified sources (Table 22, Annex). For one facility with a 'public' water source, water was piped and likely a more sanitary source than wells or other types.

In general, facilities had good storage facilities, and all supplements/medicines were protected from both the rain and sun (10 of 10 facilities). The majority of facilities also maintained supplies on shelves and not the floor, where they could be reached by creatures and/or water, (8 of 10) (Table 22, Annex).

With regard to supplies and equipment, all 10 facilities had iron/folate in stock, and 9 of 10 had chloroquin at the time of the survey (Table 23, Annex). Six of ten facilities had vitamin A in stock. All facilities have child and adult scales, and half of facilities (5) report they have laboratory facilities.

Four of ten facilities note that they have run out of stock at some time during the last 6 months (Table 23, Annex). Two facilities say this occurred with iron/folate, one with vitamin A, and one with chloroquin. To augment the stock/supply information, providers were asked separately if there are times they need supplies but don't have them and if so, for which supplies this occurs most often. Two of nine providers said they lack of vitamin A most frequently, and one provider said iron/folate. One provider also mentioned multi-vitamins.

Materials necessary for proper function of the health post varied among facilities. These included health worker tools (health cards, work guides and bulletins), and education materials such as posters, charts, and brochures (Table 24, Annex). One half or less have 'bulletins' or 'work guides' (5 and 3 respectively, of 9 facilities), and one facility reports having no health cards in stock. Presence of written/printed educational materials varied. Eight of nine facilities currently have posters, 7 have serial albums, and 5 and 3 respectively have brochures/pamphlets or flipcharts. No facility had "none" of the above materials, while 9 of 9 had at least two education materials each.

Protocols with current official health department practice guidelines for distribution of drugs and supplements are produced by DPS and disseminated to facilities to assist with nutrition management at the decentralized level. Although all facilities should have each up-to-date protocol, it was found that some facilities have all, some or none, with dates ranging from 1999-2001. Two facilities report having all three micronutrient protocols/guides. Iron/folate was the most common protocol, (found at 7 facilities), vitamin A (6 facilities), and iodine (2 facilities). Two facilities have no protocols.<sup>14</sup> (Table 25, Annex).

### *Staff & Supervision*

To assess client services, the survey inquired about the number of available personnel each facility has. Overall, the mean number of nurses/technicos was 9.38 per facility (Table 26, Annex). However, the median is much lower (1.5) indicating that most facilities have much fewer personnel than the mean. The approximate mean number of clients waiting for service was 45 as observed by survey staff at the time of the interview. The median was again higher at 50 clients, indicating that most facilities were observed to have more than the average number of waiting clients.

Provincial-level supervision/support was assessed by comparing last-recorded supervisory visits per facility. This ranged from as far back as June, 2,000 to as recent as August, 2,001, 1 to 14 months before this study (Table 27, Annex). The two most rural facilities (other than Machaze which is a district sede and currently has a new facility), Nhamagua and Rotanda, report the longest time between last visits, June and July, 2,000 respectively

## **V. Discussion**

The goal of this study is to assess factors which may hinder good delivery of nutrition-related services at health facilities and pursue ways which these might be improved, with the ultimate goal of better nutritional health for those served by facilities. It can be concluded that for a variety of reasons, management of nutrition at health facilities in Manica Province is not optimal. A shortage of health providers with little nutrition-specific training, facilities in need of physical improvements including improved water sources, periodic supply and/or equipment shortages, a lack of official protocols and regular supervision/support, and time pressures all constrain health facilities' functional management of nutrition. These constraints are complicated further by high prevalences of malaria and other infectious diseases in the region as well as general conditions related to poverty. Poverty may also affect providers' abilities to serve clients, through limitations in infrastructure, low pay, and their own education levels.

Efforts to improve management of nutrition and nutrition status among vulnerable groups served by health facilities should therefore include:

- Improved knowledge of micronutrients and signs of deficiencies, and understanding of serious outcomes of malnutrition by both providers and clients
- Improved diagnostic techniques, treatment and counseling related to nutrition by providers

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<sup>14</sup> According to DPS, protocols/policies are updated monthly and given to health providers at facilities with kits. Also according to DPS there are currently no protocols for the distribution of iodine supplements at the health facility level, therefore the above reported data on iodine protocols may be erroneous.

- Improved dietary intake (of both supplements and available foods), and management/prevention of nutrition-related illnesses by clients

This study focuses upon the role of health facilities in nutritional management. However, key sustainability issues such as improvement of economic/living conditions and basic education (especially for women), though outside the realm of this study, are mentioned as necessary co-factors for long-term improvements in health.

As a note, the ultimate goal of this study is improved health of *persons*, not to ‘catch’ provincial health providers performing poorly or lacking appropriate training. In this spirit this report and recommendations were prepared.

#### *Client & Provider Background*

This study concords with current statistics and education levels of women remain low within Manica Province (4, 16). Only little over half of 326 women surveyed had ever attended school and for only 4.15 years on average. This is as always an important point due to the powerful association of women’s education with the health of children and obvious need for attention to education of women from the community perspective (5). In certain instances education levels of clients may have affected responses, for example reported ‘travel time to facility’ and ‘time waiting for consultation’, as culture and education shape concepts of ‘time’. Education levels also affect knowledge and the capacity to comprehend information.

There does not seem to be a major language/communication gap between clients and providers at surveyed facilities (the main languages spoken by clients were also spoken by providers) and 98% of clients report understanding the ‘language’ of the provider. However, the 2% who say they do not is approximately the same percentage of households who say they speak a language that is *not* also spoken by providers (2.5%, Table 3, Annex). Although this is a small percentage of respondents (perhaps attributable only to this sample), if 2.5% of the entire population in Manica Province cannot understand provider health messages due to language barriers, it is important. Alternative communication (non-verbal) methods may be needed to reach these people.

Training levels of providers varied within and between facilities, most were basic level and elementary nurses/midwives and a small percent had medium level training. ESMI level nurses are maternal and infant health specialists, with a strong focus on prevention/education. General nurses attend to a broader scope of needs within the facility. Obviously, better-trained providers benefit clients and the community. While increasing numbers of doctors or ESMI nurses may not be possible in the short run, it would be useful and relatively easy to provide additional maternal and child health prevention-based training to general nurses and midwives (similar to that received by ESMI nurses). This may be especially important in terms of *nutritional* health for the more rural P.S.’ which have half as many ESMI providers as the larger C.S.’ Given that (in this sample) more time is reported given to diet/nutrition counseling at rural P.S.’, the mechanism and willingness for this may already be in place. Precisely because communities near the smaller health posts lack some of the benefits of the larger ones (including infrastructure and lack of other information channels), this may be even more important.

While some of providers have participated in special nutrition courses (or seminars), only 6 of 10 providers report the only nutrition training they have received was part of General Training. In general, providers have undergone little nutrition training, which half of them report only as part of general training which (in this sample) could have been from between 1 to 28 years earlier. Based on this, providers in Manica Province may have had little if any micronutrient-specific nutrition training.

### *Nutrition Knowledge*

Basic provider awareness of the nutritional status of the population in the region is not optimal. Less than half of pre-natal and post-partum providers believe malnutrition is a problem in their region. While appropriate responses were given for types and causes of malnutrition some inappropriate ones were also given, an indication that prevalences, definitions, and causes of malnutrition may not be well understood by provincial health providers. Anemia was the only micronutrient malnutrition named as a 'type'. Provider responses focused on growth-related types of malnutrition, underweight or marasmus for example rather than micronutrients. This may also illustrate that greater attention in general is given to iron than vitamin A or iodine. Responses such as 'poverty' and 'taboos' as causes of malnutrition indicate that some providers *do* understand the relationship between poor health and socioeconomic and cultural factors.

While nearly all providers could correctly name one 'sign' of the three micronutrient deficiencies, the more grave 'consequences' of these deficiencies were less well-articulated. 'Consequences' were included in the survey separately from 'signs' to assess depth of knowledge about particular nutrient deficiencies<sup>15</sup>. No provider could describe serious health consequences of iodine deficiency beyond goiter (itself a 'sign'), and 8 out of 10 could do so for iron or vitamin A. A sole provider responded that vitamin A deficiency 'provokes' more illness. As one of its major roles is maintenance of the immune system, vitamin A is relevant to all other illnesses and overall health. These indicate that knowledge of common nutrient deficiencies is less than optimal among health providers. Client knowledge of nutrient deficiencies was lower still (per interview responses). This may be related to a number of things including problems with provider knowledge/communication, client comprehension and/or memory or bias/error. Additionally, client responses may reflect previous knowledge levels.

### *Diagnostic/Communication Practices*

The low percent of clients who feel their doubts/questions have been attended along with observations of few providers explaining the child's illness indicate an area for improvement in basic care and communication practices. These are simple but important practices which can gain client confidence and facilitate dialogue, ultimately impacting client practices and health. Given that some clients stated an interest in more information about nutrition, there appears a good opportunity for improvement in this area.

Diagnostic practices varied depending on the group. Exams (both questions and physicals) to assess the state of client health were better for post-partum and pre-natal women than for children. Specifically nutrition-relevant exams were more thorough for pre-natal women than other groups. This could reflect the greater availability of information and focus in general on

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<sup>15</sup> Providers were asked to name one sign and consequence of each deficiency, with the exception of anemia, for which two signs were asked.

pre-natal women. Basic but important inquiries such as about drugs/vitamins the client is taking, vaccination status, malaria/illnesses and appetite were inadequate given their strong association to malnutrition. Inquiry about malaria was especially low for anemia-prone reproductive-age women but should always be included for this vulnerable group.

Few providers specifically evaluated vitamin A deficiency or anemia (via inquiries about night blindness, assessing ‘pallor’ or ordering hemoglobin tests), and only a small proportion measured the temperature of post-partum women or under-5 children. This is concerning given that most (78%) children under-5 were ill, and the high risk for post-partum infection. Perhaps precisely because most children were ill time constraints prevented other routine nutrition-related diagnostics in favor of managing the illness. If so, an even stronger case could be made for improved nutritional diagnostic practices of under-5 year olds during illness, a critical age where growth-faltering is common. Additionally, observers reported that less than two thirds of infants examined during post-partum exams were weighed. Considering the importance of growth-monitoring during infancy, every post-partum infant should be weighed as it is quick and easy and little equipment/personnel is needed.

Diagnostic practices likely reflect time pressures, shortage of well-trained personnel and perhaps knowledge levels of providers. In some cases, providers’ self-reported practices suggest good nutritional knowledge, (i.e., signs of deficiencies, treatment with iron supplements for anemia), and not in others (i.e., dietary counseling for deficiencies, vitamin A supplementation, knowledge of malnutrition levels). However, providers’ responses about their knowledge and practices should be considered in light of the manner they were interviewed, i.e., on the spot, freely responding without prompts, and during or at the end of a busy workday. Additionally, although attempts were made to keep details of the survey vague, providers were aware beforehand that nutrition was the subject of the survey which could have biased responses. Providers’ self-reported practices are therefore likely *not* the best source of practice assessment but rather a compliment to those observed and elicited from clients.

Assessing micronutrient status can be relatively simple, especially basic exams (such as appraising mucosas, pallor or goiter, or inquiring about diet, night blindness, malaria, and/or weakness), and can be easily incorporated into any exam with little additional time, staff, training, or equipment (except for hemoglobin).

Most clients have health cards in their possession, and providers appear to have good record-keeping practices in place (i.e., marking health cards and registries). This diligence in record-keeping should be praised and reinforced by supervisors. Good records are fundamental to surveillance and monitoring, allowing progress and losses to be measured and assuring proper practices. Surveillance/monitoring methods should be evaluated often, and providers’ should be shown the results of their efforts (reports of data collected).

#### *Malnutrition Treatment & Prevention Practices*

Treatment for malnutrition is a key element of this study, especially relating to dietary counseling and nutrition-relevant prescriptions.

At the highest, two-thirds of providers self-report that they ‘treat’ anemia by counseling improved dietary intake of iron (for pre-natal women) and only a little over half say they do this for vitamin A deficiency (VAD) with any of the groups. This is very low considering the practical and important role diet plays in overall health. Even if supplements are given, clients should also be encouraged to eat better, empowering them about ways they can improve their own health.

Additionally, few providers report normally treating worms and/or malaria concurrently in anemic children, and none report doing this for women. These illnesses are often found alongside anemia and VAD and complicate the nutrition battle. Because worms and malaria are highly prevalent in Manica Province, giving Mebendazol and/or Chloroquin concurrently with iron/folate tablets for anemia should be considered as a future protocol action. At the least providers must be aware of the probability of co-existence and associated additional risk.

It should be noted that only about two-thirds of pre-natal women were given iron/folate, however, according to protocol all pre-natal women should receive it. Additionally, 3 of 10 providers say they treat VAD in pre-natal women with supplements which, if true is greatly concerning as high-dose vitamin A during gestation can be harmful for the fetus, and this action is not recommended by experts. Treatment of post-partum women with supplements however, *is* protocol in many poor countries where VAD is endemic and recommended for protection of both the mother and the breastfeeding infant. This action, though currently not policy, is being explored for future VAD programming in Mozambique. As might be expected, discussion of iron deficiency was more common for pre-natal women and most VAD discussion was in child consultations. However, all three groups included in this study are at high-risk for each deficiency and should be assured equal concern on behalf of providers.

Explanation and counseling with regard to prescribed supplements also appeared inadequate, especially for recipients of iron/folate. Few women say the provider discussed secondary effects (a large barrier for iron compliance), and less than half say they know why they were given iron/folate. Further, about a third of respondents who received iron/folate say they do not intend to take it. The subject of ‘willingness’ needs to be addressed by providers every time iron supplements are given and doubts or fears discussed at that time. Giving supplements when the client has no intention of taking them is wasteful and fails in its purpose. Further research on the subject of doubts/willingness/myths about iron might give more insight into improving compliance <sup>16</sup>.

Whereas most facilities report having educational materials such as posters and flip-charts, little use appears to be made of them to assist or enhance explanation. Few facilities report having brochures or educational pamphlets. Creation of such written or visual educational materials with nutritional themes could be explored for use at the facility as well as community level, and may be particularly useful in facilities where clients wait a long time to be attended.

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<sup>16</sup> Dispelling myths and doubts should be a key element of provider counseling. Current misconceptions surrounding iron include ideas that eating iron-rich eggs when pregnant results in a bald baby, or that iron tablets are contraceptives.

### *Nutrition Practices & Counseling*

In addition to low self-reported practices mentioned above, actual counseling about nutritious foods/diet was also low among all groups of this study. Counsel about major micronutrient deficiencies was low as well (according to client interviews). Although both of these were generally better for pre-natal women than post-partum women or under-5 children there is much room for improvement given the importance of diet/nutrition to overall health. Discussion of exclusive breastfeeding and complimentary feeding among appropriate age groups was exceedingly low<sup>17</sup>, especially the mention of greens/vegetables and animal foods. Many greens and vegetables are readily available and affordable or grown at home. Less available are animal-based foods, with the exception of eggs, likely due to economic limitations. Goat's milk is available and highly nutritious but considered undesirable in Manica Province due to its different smell and taste (16). Therefore, further formative research might be considered at the provincial level in the interest of development of appropriate food-based counseling messages relevant to the local climate/population.

Although there are often differences between observations and client responses with regard to diet and nutritional counseling, (higher all around according to observations), more important is whether the *caretaker* can recall appropriate health messages. Such council is especially critical for children 4-6 months of age who enter a very vulnerable stage in which nutritional status often degenerates due to the introduction of new foods along with environmental contaminants that accompany them. The importance of proper dietary and nutritional messages cannot be stressed enough. These can be easily added into even quick consultations.

During this survey, more nutrition counseling (especially dietary) was done in the smaller P.S.' than C.S.', where less well-trained staff (ESMI nurses) exists and less time was spent per consult. Perhaps due to their remoteness, they are more accustomed to giving more basic health advice – including regarding nutrition and/or hygiene. Perhaps providers in P.S.' know clients personally and feel more involved in the health of their communities. (This may also be due to sample differences.) It is an interesting finding that should translate to acknowledgement of all providers as special guardians of health in their communities.

Acknowledging limitations of gender-inequity and economic resources, dietary practices are within our control and greatly impact health. As caretakers, women guard the health of families and children, therefore targeting women with good nutritional messages is key. Stated interest in more information about nutrition and child feeding by clients implies good opportunity for improved nutritional discourse at the health-facility level. As the consultation may be the client's only exposure to proper health messages, wise use of this time is especially critical. Since time is limited during consultancies, the best most efficient manner to accomplish this should be given careful consideration, and strongly include providers' input.

### *Facilities related*

While not the topic of this study, results show that facilities varied in size and condition as to building infrastructure and/or water supply. Naturally, facilities-related constraints limit

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<sup>17</sup> 'Complimentary feeding' includes methods of enriching foods, as well as the best foods to feed children over 4-6 months whose nutritional needs exceed those supplied by breast milk.

providers' ability to deliver effective health services and should be considered in the larger picture.

A high number of clients in relation to personnel, as well as a low average minutes-per-consult are indicators that health posts are busy and in need of more well-trained staff and equipment<sup>18</sup>. Providers in several facilities manage without regular supervisory visits, up-to-date training and/or protocols, and experience intermittent stock/supply shortages (for whatever the reason) which inhibit their ability to serve clients needs.

Nutrition management is and should be a key part of provincial health facilities services. Facilities serve a large number of clients and provide many nutrition/micronutrient-related services per year, and are therefore valuable community information channels. Nutrition management capacity at the facility level can be further strengthened through investments in provider training, useful educational materials, and amelioration of facilities-related constraints, summarized as follows:

## VI. Recommendations

1.) A strong nutrition education campaign for health providers in the province to include the following:

- Basic education of current malnutrition situation/statistics for Manica Province, with district/regional details as available. Compare to other poor and rich regions and discuss ways in which other similar communities have united to improve nutrition for very poor.
- Basic knowledge of iron, vitamin A, and iodine and their deficiencies. This should include best (common and available) dietary sources, signs/consequences, at risk groups including adolescent/reproductive-age girls. Strong focus should be placed on the *graver* consequences of these deficiencies which are inter-generational and affect the entire community, and the relative ease with which preventive measures can be implemented. (Especially for the role of iodine, which is rarely discussed.) Basic micronutrient education should address the following issues:
  - a) Current protocol for each nutrient
  - b) Compliance issues (esp. doubts, myths, and side effects of iron/folate)
  - c) Surveillance (importance and methods, i.e., keeping records)
  - d) Relevant dangers (esp. supplementing vitamin A during pregnancy. But since vitamin A needs increase during pregnancy, should counsel to increase dietary intake of vitamin A foods *with* fat for absorption)
- Educate providers to promote improved diets, within the underlying foundations of:
  - *empowerment*, that within each family's economic situation *some* choices exist
  - good food as *preventative medicine*, that eating well helps prevent illness and the need for doctors and medicines

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<sup>18</sup> According to the Director of MCH with Health Alliance International, a minimum of 15 minutes per consult is needed for thorough diagnostic exams, including nutritional assessment.

- *praise and acknowledgement* of providers for their important role in the health of communities

Specific dietary focus should include the following (but not limited to):

- a) The easiest, most important thing mothers can do to guarantee good health of a child is exclusively breastfeed infants under 6 months of age (focus on ‘*exclusive*’ – no water, nothing else)
  - b) Discuss/demonstrate easy nutrient-enriching practices for weanlings as well as the whole family, (eg., adding peanuts or fruits/vegetables to cereals, boosting soups with beans and/or greens, using orange-flesh sweet potatoes) and improved cooking practices which preserve nutrients. Encourage regular demonstrations/classes at facilities
  - c) Incorporating overall more dietary counsel in consultations, inquiring about specific nutritional questions/doubts
  - d) Address specific nutritional topics mentioned by clients as areas of interest
- Counsel as to the *nutritional* importance of preventing/treating malaria, worms and parasites, and stress ‘basic’ and simple hygiene and its connection to long-term nutritional status by way of chronic intestinal ills, especially for weanlings. Focus should be on the simplest and easiest of ways these can be incorporated into one’s lifestyle such as hand-washing and toilet hygiene, boiling water, bed nets and treatments such as chloroquin and mebendazol (free at health posts).
  - Incorporate a strong argument for later parity for girls (and importance of staying in school) – using gestational development and long-term health/educability as the reasons for delaying pregnancy. (INCLUDE: Statistics on health of babies by education level of mother, comparing rich and poor, and middle (Europe/U.S, Cuba, Costa Rica, Africa).
  - Educate providers to stress the use of *iodized* salt (it doesn’t cost much more), and connect it to the rich tradition of having babies in Mozambique. (Iodine is most needed by the foetus).
  - Train providers to do quick, easy exam techniques (eye signs, pallor, goiter) and diagnostic questions, (diet, night blindness) to build into current consult routine without adding much time, effort, or cost.

2) Explore the development of materials to support providers’ efforts at the health unit level (and perhaps community level). Potential materials could include:

- a) Visual aids for use during consultation by health workers reminding them of key nutrition-related actions and messages
- b) Posters describing micronutrients, deficiency signs and nutrient-rich foods
- c) Take-home pamphlet, (written for pregnant and post-partum women, and caretakers of under-5 children), describing deficiency signs, easy diet adjustments/additions, important points (growth/development, myths), etc. The feasibility of such pieces will depend on language capabilities of the intended audience.

- 3) Consider community ‘nutrition task force’ including community members, school-leaders/teachers, health providers, and community-level health promoters (such as work with HAI), to tie together nutrition messages, support and enhance facility-based nutrition services.
- 4) Problems of supplement supply needs to be addressed at central/donor level, and facilities encouraged to monitor stock/supplies carefully.

***Ministry of Health / Central-level recommendations:***

- Review of national iron/folate protocol for all prenatal and post-partum women and children which includes systematic screening, comprehensive treatment (supplementation and presumptive treatment of malaria/worms), and education/counseling guidelines per current international recommendations
- Continue formative research for development of province-specific food-based nutrition counseling messages, as has been conducted in one province in each region (Northern, Central, Southern) so far by the Nutrition Unit
- Consideration of incorporation of new IVACG/WHO/UNICEF guidelines and recommendations on management of VAD
- Single, high-dose Vitamin A for all post-partum women within 8 weeks of delivery, per current WHO recommendations
- Complete national Vitamin A deficiency prevalence estimates
- Increased investment and interest in nutrition services at health facilities, including continuing education for providers, education materials, effective nutrition surveillance and increasing supervision/support (with potential assistance from HKI)

***Potential areas for future research:***

- Further research into iron/folate compliance problems and solutions
- Follow-up to this health facilities study (evaluation), assessing knowledge of provider/client, practices, and facilities-based issues

## VII. References

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## VIII. Annex of Tables

**Table 1. Client Demographics <sup>1</sup>**

		<b>Median</b>	<b>Range</b>	<b>n</b>
Average Age of Women	22.5	21	14 - 40	159
Average Age of Child (Months)	18.5	14	1 - 59	137
Percent Attended School	57%	-	-	326
Average Years of Education	4.15	4.3	1 - 12	186
Average Time (Minutes) Waiting for Consult	81	53	1-360	234
Average Time (minutes) to Travel to Facility	67	41	1-300	233
Method of Transport to Facility (n=326) <sup>2</sup> :				
	Foot	85%		
	Bicycle	5%		
	Chapa	9%		
	Other	2%		

<sup>1</sup> Source: Client Interviews

<sup>2</sup> More than one method of transport could be used.

**Table 2. Languages Used by Clients and Providers**

<b>Language/Communication *</b>	<b>Percent of Consults and Languages Observed (n=189)</b>	<b>Languages Reported Spoken in Household (n=326)</b>	<b>Providers Reporting Language Skills (n=10)</b>
CiBarue	25%	21%	3
Portuguese	24%	26%	8
CiTewe	20%	27%	4
CiManyika	12%	15%	2
Ndau	9%	19%	5
Nhyungue	2%	6%	1
Other Languages	10%	14%	7

**Percent of consults in which use of more than one language was observed (n=189) 6%**

**Table 3.**

<b>Households Reporting Use of Language Not Spoken by Facility Personnel (n=326)</b>		
	<b># HH</b>	<b># HH which Report No Other Language</b>
Magorong	2	2
Cibnga	1	-
Shona	2	-
Matsuga	1	-
Zambeziiana	1	-
Bilonga	1	-
Changana	2	-
Chitonga	3	3
Chigorongosi	2	2
Masha	1	-
<b>Total</b>	<b>16</b>	<b>8</b>
<b>Percent of Total (n=326)</b>	<b>5%</b>	<b>2.5%</b>

**Table 4.**

<b>Type and Level of Health Facilities Staff (n=30<sup>1</sup>)</b>	
<b>Level/type</b>	<b>% of consultations</b>
<b>Elementary (Total)</b>	(20%)
Nurse	7%
Midwife	13%
<b>Basic (Total)</b>	(67%)
General Nurse	33%
ESMI	37%
<b>Medium (Total)</b>	(10%)
ESMI	10%
<b>Ratio of ESMI Nurses at C.S. compared to P.S.<sup>2</sup></b>	2.2
<hr/>	
Ave. number of years as health practitioner <sup>3</sup>	8.8 yrs
Percent Female	70%
<sup>1</sup> Source: Observations. One provider per group, per facility (n=30). <sup>2</sup> C.S.= Centros de Saude; P.S. = Postos de Saude <sup>3</sup> Range: 1 - 28 years	

**Table 5.**

<b>Provider Training in Nutrition (N=10) <sup>1</sup></b>	<b>Number</b>	<b>Year of Training (range)</b>
As part of General Training	6	<i>na</i>
Special Course or Seminar	4	1996 - 2000
Other <sup>2</sup>	2	<i>na</i>
None	1	<i>na</i>

<sup>1</sup> Source: Provider Interviews

<sup>2</sup> "Other" = 1) meeting; 2) culinary demonstration.

Note: More than one answer possible per respondent

**Table 6.**

	<b>Number of Providers</b>		
	<b>Pre-natal (n=10)</b>	<b>Post-partum (n=10)</b>	<b>Children Under-5 (n=10)</b>
<b>Reporting Malnutrition is Problem in District</b>	4	4	8
<b>Most Common Types of Malnutrition <sup>1</sup></b>			
Anemia	2	2	-
Underweight	-	1	-
Marasmus	-	-	2
Kwashiorkor	-	-	1
<b>Reported Reasons for Malnutrition<sup>2</sup></b>			
Shortage of Food	2	1	5
Early cessation of breastfeeding	-	-	2
Poverty	1	-	-
Hygiene	-	1	-
Taboos	-	-	1

<sup>1</sup> This section was misunderstood by interviewers and providers. Responses also included illnesses such as TB, malaria and diarrhea in addition to nutrition outcomes.

<sup>2</sup> Responses were freely given by providers and are shown here to illustrate provider thoughts about indirect reasons for malnutrition.

Note: Not all providers reporting malnutrition is a problem gave responses about types/reasons.

**Table 7.**

<b>Provider Knowledge of Specific Nutrient Deficiencies (numbers of providers =10)</b>		
	<i>Knows Sign</i> <sup>1</sup>	<i>Knows Consequence</i> <sup>2</sup>
Iron	10	7
Vitamin A	10	8
Iodine	8	0
Folate	na	7

<sup>1</sup> Correctly stated sign of deficiency

<sup>2</sup> 'Consequences' were meant to elicit responses recognized as separate and distinct from 'signs' of deficiency, and indications of the gravity of these deficiencies. Named consequences of Iron deficiency were: anemia and death. Vitamin A deficiency: blindness, night blindness, increased illness. Iodine deficiency: No ultimate grave consequences named, but hypothyroidism and goiter were named, both are 'signs' as well as 'consequences'. They are NOT included as correct. Consequences of folate deficiency: premature birth and abortion of fetus, anemia, low birth weight were named as consequences.

**Table 8. Provider Communication and Client Knowledge**

	<b>Provider Discussed Deficiency</b>		<b>Client Able to Name Sign of Deficiency *</b>
	<i>Interview</i> (n=326)	<i>Observed</i> (n=189)	<i>Total</i> (n=326)
Iron	25%	6%	31%
Vitamin A	20%	2%	8%
Iodine	3%	0%	2%

\* Questionnaires asked both if client is able to name a sign, and if so, what is that sign. Data on exact signs named by client is incomplete, therefore these figures assume interviewer marked "yes" only if response was correct.

Table 9.

<b>Observed Practices Related to Nutritional Health Assessment <sup>1</sup></b>					
<b>Diagnostic Exam Questions (percent)</b>	<b>Pre-natal (n=73)</b>	<b>Post-Partum (n=39)</b>	<b>Children &lt; 59 months (n=78)</b>	<b>Total (n=189)</b>	<b>Percent of Providers Reporting Practice as Part of Diagnostic Routine, (n=30 <sup>3</sup>)</b>
Asked reason for visit <sup>2</sup>	48	51	74	59	<i>na</i>
Asked how client is feeling	78	87	<i>na</i>	81	90%
Asked about appetite/diet	69	82	41	60	40%
Asked about malaria/other illnesses	34	39	69	49	<i>na</i>
Asked about vaccination	<i>na</i>	<i>na</i>	49	49	50%
Asked about hemorrhage	<i>na</i>	85	<i>na</i>	85	10%
Asked about current drugs/vitamins	39	28	27	32	20%
Mean num. questions asked per consult	2.7	3.7	2.6	3.0	<i>na</i>

<sup>1</sup> Providers were allowed to 'freely' respond as to the questions and exams they normally perform during a consultation

<sup>2</sup> 36% of providers overall knew beforehand the reason for visit (48% each of pre-natal and post-Partum consults, and 19% of child consults)

<sup>3</sup> n=30 if question applies to all groups; n=10 provider respondents per group (pre-natal, post-partum, children < 59 months)

*na* = question did not apply to particular group in questionnaire

Source: Observations

**Table 10.**

<b>Clinical Diagnosis: Exams Performed (percent) <sup>1</sup></b>					
	<b>Pre-natal (n=73)</b>	<b>Post-Partum (n=39)</b>	<b>Children &lt; 59 months (n=78)</b>	<b>Total (n=189)</b>	<b>Percent of Providers Reporting Practice as Part of Diagnostic Routine, (n=30 <sup>2</sup>)</b>
<b>Exams</b>					
Pelvic/Breast Exam	70	82	<i>na</i>	74	40%
Fetal Measurement	97	<i>na</i>	<i>na</i>	97	<i>na</i>
Fetal Heartrate	99	<i>na</i>	<i>na</i>	99	70%
Temperature	<i>na</i>	36	18	24	50%
Urine Exam	6	0	<i>na</i>	4	30%
<b>Nutrition Relevant Exams</b>					
Weight (growth monitoring)	89	59	72	76	70%
Blood Pressure	92	59	<i>na</i>	81	60%
Mucosas of the Eyes	71	48	39	53	70%
Inquired about Night Blindness	3	3	6	4	10%
Examined Pallor for Anemia <sup>3</sup>	26	18	4	15	70%
Assessed Edema	48	46	<i>na</i>	47	40%
Hemoglobin Test	25	3	10	14	40%
<b>Average Number of Nutrition Relevant Exams per Consult</b>					
	3.5	2.7	1.3	2.5	<i>na</i>
<sup>1</sup> Providers were allowed to 'freely' respond as to the questions and exams they normally perform during a consultation.					
<sup>2</sup> n=30 if question applies to all groups; n=10 provider respondents per group (pre-natal, post-partum, children < 59 months)					
<sup>3</sup> Could include skin, nails, palms, tongue and/or mucosas of the eyes.					
<i>na</i> = question did not apply to particular group in questinnaire					
Source: Observations					

**Table 11.**

<b>Clinical Diagnosis of Child if also Examined during Post-Partum Consult</b>		
<b>Diagnostic Exam Questions</b>	<b>Post-Partum Observations (n=38)</b>	<b>Percent of Providers Reporting Practice as Part of Diagnostic Routine, (n=9)</b>
Asked if mother is breastfeeding	87%	9
Asked about problems with breastfeeding	77%	9
Asked about infections or illness with child	48%	5
Asked if mother is giving other liquids	8%	5
Asked about child vaccination	33%	3
<b>Nutrition Relevant Exams</b>	<b>(n=39)</b>	<b>(n=9)</b>
Weight (Growth Monitoring)	59%	9
Mucosas of the Eyes	41%	5
Temperature	18%	4
<b>Average Number of Nutrition Relevant Exams per Consult</b>	2.0	<i>na</i>

<sup>^</sup> Providers were allowed to 'freely' respond as to the questions and exams they normally perform during consult.  
*na* = question did not apply to particular group in questionnaire

**Table 12.**

<b>Mean Time per Consultation (minutes)</b>				
	<b>Pre-natal (n=72)</b>	<b>Post-Partum (n=37)</b>	<b>Children &lt; 59 months (n=61)</b>	<b>Total Observed (n=170)</b>
<b>Type of Facility</b>				
Centro de Saude	8.6	11.3	6.5	8.8
Posto de Saude	6.2	7.8	7.1	7.0
<b>Total</b>	8.0	10.6	6.7	8.4

**Table 13.**

<b>Reported Deficiency Diagnosis and Treatment Practice <sup>1</sup></b>			
<b>Treatment Methods as Reported by Providers</b>			
	<b>Pre-natal (n=10)</b>	<b>Post- Partum (n=10)</b>	<b>Children &lt; 59 months (n=10)</b>
<b>Anemia</b>			
Give Iron/folate tablets	9	7	7
Counsel to eat iron rich foods	7	5	4
Give Chloroquin	0	0	2
Give Mebendazol	0	0	2
<b>Vitamin A Deficiency</b>			
Give vitamin A capsules	3	3	7
Counsel to eat vitamin A-rich foods	6	6	5
Do not treat	1	1	1

<sup>1</sup> Providers responded 'freely' when asked how they treat Anemia and Vitamin A deficiency.

**Table 14.**

<b>Prescription-related Treatment and Communication (percent)</b>				
	<b>Pre-natal (n=129)</b>	<b>Post- Partum (n=50)</b>	<b>Children <sup>1</sup> &lt; 59 months (n=115)</b>	<b>Total (n=294)</b>
Prescribed/gave Iron/Folate Tablets	66	20	17	39
Prescribed/gave Chloroquin	11	6	47	24
Prescribed/gave Vitamin A	<i>na</i>	<i>na</i>	6.8 (n=147)	<i>na</i>
Explained importance of taking medicines <sup>2</sup>	39 (n=85)	67 (n=12)	62 (n=68)	51 (n=165)
<b>For those who received iron/folate:</b>				
Client knows why given iron/folate	40	80	50	45
Provider explained how to take iron/folate	93	60	60	84
Provider explained about secondary effects	19	20	25	20
Client intends to take iron/folate	72	60	<i>na</i>	71

<sup>1</sup> 78% (115/147) of all child consults were for illness as reported by caregivers, n=115 for under-5 children. Table C, text.

<sup>2</sup> Received either iron/folate or chloroquin or vitamin A

Source: Client Interviews

**Table 15.**

<b>Key reasons why client will not take iron/folate (n=28)</b>	
Causes vomiting	7%
Enjoada <sup>1</sup>	5%
First time (worried)	2%
No response	86%

<sup>1</sup> "Enjoada" refers to feeling of nausea

**Table 16. Recording Practices: Health and Pre-Natal Cards**

	<b>Pre-natal</b>	<b>Post-Partum</b>	<b>Children &lt; 59 months</b>	<b>Total</b>
<b>Client Has Pre-natal/Health Card <sup>1</sup></b>	(n=129) 98%	(n=50) 96%	(n=149) 88%	(n=326) 94%
<b>Provider Verified Card <sup>2</sup></b>	(n=73) 97%	(n=39) 69%	(n=78) 50%	(n=190) 93%
<b>Provider Marked Health Facility Register <sup>2</sup></b>	78%	68%	<i>na</i>	80%

<sup>1</sup> Source: Client Interviews  
<sup>2</sup> Source: Observations

**Table 17.**

Provider Communication Practices (percent)	Pre-natal		Post-Partum		Children < 59 months		Total	
	Obs	Int	Obs	Int	Obs	Int	Obs	Int
	(n=73)	(n=129)	(n=39)	(n=50)	(n=78)	(n=147)	(n=190)	(n=326)
Used Cartazes/Materials to Assist Explanation	12	12	28	18	1	9	11	12
Client understood language used by provider	97	98	100	98	95	95	97	97
Client understood counsel given	86	72	82	84	82	85	84	80
Provider asked about client doubts/questions	73	16	62	34	39	10	57	16
Provider explained nature of illness to caregiver <sup>1</sup>	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>	42% (n=53)	<i>na</i>	<i>na</i>	<i>na</i>

<sup>1</sup> Question applies only to sick children < 59 months.

**Table 18.**

Communication & Information Gaps (percent)				
	Pre-natal	Post-Partum	Children < 59 months	Total
	(n=129)	(n=50)	(n=147)	(n=326)
Percent of clients expressing desire for more information from providers	30	64	50	44
<b>Types of information desired <sup>1</sup>:</b>	<b>(n=39)</b>	<b>(n=32)</b>	<b>(n=74)</b>	<b>(n=145)</b>
Pregnancy	16	8	3	8
General Health	4	8	20	13
Diet during pregnancy	17	12	12	13
Nutrition in general	2	20	8	9
Child Feeding	5	36	24	22

<sup>1</sup> Non-mutually exclusive categories  
Source: Client Interviews

**Table 19.**

	<i>Client Interview</i>				<i>Observed</i>			
	Pre-natal (n=129)	Post- Partum (n=50)	Children < 59 months (n=147)	Total Reported by Client (n=326)	Pre- natal (n=73)	Post- Partum (n=39)	Children < 59 months (n=78)	Total Observed (n=189)
Provider Discussed Nutritional Status of Client	83	96	69	79	na	na	na	na
Provider Discussed Diet with Client	17	na <sup>1</sup>	12	19 (n=276)	59	49	26	44
Discussed Nutrient Deficiencies:								
Iron	45	18	10	25	8	0	8	6
Vitamin A	10	22	27	20	4	0	1	2
Iodine	5	2	1	3	0	0	0	0
Percent of providers discussing at least one of above deficiencies specifically	43	36	29	36	8	0	9	7
<b>Number of facilities who report providing nutrition / food-preparation demonstration (n=8)<sup>2</sup>:</b>				<b>6 (75%)</b>				

Note: n's as listed in top categories apply to entire table unless otherwise stated  
na = question did not apply to particular group in questionnaire  
<sup>1</sup> "Diet" for post-partum group applies only to infant feeding  
<sup>2</sup> Source: Provider questionnaires

**Table 20.**

<b>Child Feeding Practices (percent)<sup>1</sup></b>	<i>Client Interview</i>			<i>Observed</i>		
	Pre-natal (n=129)	Post- Partum (n=50)	Children < 59 months <sup>2</sup>	Pre- natal (n=73)	Post- Partum (n=39)	Children < 59 months <sup>3</sup>
			(n=110)			(n=45)
Discussed Infant/Child Feeding	12 (n=129)	88 (n=50)	12 (n=137)	na	72 (n=39)	26 (n=58)
Discussed exclusive breastfeeding < 6 months of age	8 (n=129)	70 (n=50)	11 (n=27)	na	72 (n=39)	46 (n=13)
Discussed complimentary foods > 6 months of age	na	na	12	na	na	33
Enriched foods (cereals/soups)	na	na	10	na	na	33
Eggs, milk, meat	na	na	4	na	na	27
Greens and vegetables	na	na	4	na	na	9
Fruit	na	na	9	na	na	31

na = question did not apply to particular group in questionnaire  
<sup>1</sup> Questions apply to Post-partum and children < 59 months only with the exception of 'future' feeding practices for pre-natal interviews.  
<sup>2</sup> Sample size for children (interviews) < 59 months: Total: 149. < 6 months = 27; > 6 months = 110. Ages for 10 are missing. Age related feeding practices do not include missing ages.  
<sup>3</sup> Sample size for observed children < 59 months: Total: 78. < 6 months = 13; > 6 months = 45. Ages for 20 are missing. Age related feeding practices do not include missing ages.

**Table 21.**

<b>Type of Nutritional Counseling by Type of Facility</b> (Source: Client Interviews)		
	<b>Centro Saude (n=140)</b>	<b>Posto Saude (n=50)</b>
Iron	5%	10%
Vitamin A	3%	0%
Iodine	0%	0%
Nutritional Diet	36%	62%
Time of Consult <sup>1</sup>	8.8	7.0

<sup>1</sup> Mean number of minutes, from observations, n=170.

**Table 22.**

<b>Physical Condition of Health Facility (n=10)</b>	
<b>Water Source</b>	<b>Number of Facilities</b>
Piped, inside clinic	6
Piped, public source	1
Public well	1
Other	2
<b>Storage Facilities</b>	
Supplements/Medicines protected from rain/sun	10
Supplements/Medicines stored on shelves (not floor)	8

**Table 23.**

<b>Equipment/Supplies in Facility at time of Study (n=10)</b>	<b>Number of Facilities Which Currently Have in Stock (n=10)</b>	<b>for which stock has run out during the last 6 months (n=10)</b>	<b>Run out of frequently * (n=9)</b>
Iron/Folate Tablets	10	2	1
Vitamin A Capsules	6	1	2
Chloroquin	9	1	-
Laboratory Facilities	5	-	-
Adult Scale	10	-	-
Child Scale	10	-	-

\* Providers were asked in separate question if they ever need medicines/supplements but don't have them, and if so, which ones they frequently need. Of 4 affirmative respondents, 2 noted vitamin A, and 1 iron/folate. One also noted multi-vitamins.

**Table 24.**

<b>Materials and Supplies related to Nutrition, Diet, and Vitamin A (n=9)</b>	
<b>Type of Material</b>	<b>Number of Facilities which Have Materials</b>
Posters	8
Serial Albums	7
Flipchart	3
Brochures, pamphlets	5
Report having at least 2 types educ. materials	9
Work Guides	3
Information Bulletins	5
Health Cards (pre-natal, child health)	8

**Table 25.**

<b>Protocols for Nutrition-related Activities at the Health Facility Level (n=8)</b>		
<b>Type of Protocol</b>	<b>Number of Facilities</b>	<b>Year of publication <sup>1</sup></b>
Iron/Folate	7	Ranges from 1999 - 2001
Vitamin A	6	Ranges from 1999 - 2001
Iodine <sup>2</sup>	2	Ranges from 1999 - 2001
Number of Facilities with No Protocols	2	-
Number of Facilities with All Three Protocols	2	Ranges from 1999 - 2001

<sup>1</sup> Protocols updated and published monthly per DPS  
<sup>2</sup> According to DPS, no official protocol exists for iodine

**Table 26.**

<b>Providers and Client Services</b>			
	<b>Mean</b>	<b>Median</b>	<b>Range</b>
Number of nurses/technicos per facility	9.38	1.5	1 - 54
Number of minutes per consult <sup>1</sup>	8.4	7.0	1 - 21
Appx. number of clients awaiting service <sup>2</sup>	45	50	1 - 80

<sup>1</sup> Per observations  
<sup>2</sup> As observed at time of interview (n=170)

**Table 27.**

<b>Supervision/Support as Reported by Facility (n=7)</b>	
<b>Facility</b>	<b>Date of Last Visit</b>
Gondola C.S.	Feb-01
Sussundenga Sede	May-01
Rotanda	Jul-00
Machaze	Aug-01
Guro C.S.	Aug-01
Catandica C.S.	Aug-01
Nhamagua	Jun-00