THE RELATIONSHIP BETWEEN WEALTH AND MALNUTRITION IN THE HIGHLANDS OF ETHIOPIA

Arabella Duffield¹, Tayech Yimer¹, Kiros Tefera¹, Anna Taylor¹

Introduction

The importance of care in the causality of malnutrition is now widely recognized. Care includes both caring practices i.e. behaviours which have an impact on child nutritional status such as care for women, infant and young child feeding, hygiene practices and health seeking behaviour and caring capacities which are determined by caregivers’ access to economic and human resources (1).

Much of the investment in large scale, long-term nutrition programmes is now focussed on addressing the care components of the causes of malnutrition. For example, the Ethiopian Government is planing to start a community growth promotion programme in selected areas of the country shortly. This programme aims to educate mothers about caring practices through community based growth monitoring and hence improve the growth of young children. While the importance of poverty as a basic cause of malnutrition is recognized, intervening at household and community level to change caring behaviour is regarded as a sustainable and effective way of realizing impacts on malnutrition in the immediate term and before poverty reduction can be achieved.

SC-UK recognizes that there is evidence to suggest that certain communities in Ethiopia employ caring practices, which do not optimize child nutrition. For example the recent DHS survey (2000) showed that only 32% of infants born in Amhara were breastfed within one hour of birth and only 54% of women reported knowledge of ORS packets (2).

There is little evidence, however, to show that intervening at household and community level to change caring behaviour through growth promotion improves nutritional status in Ethiopia. SC-UK is concerned that the relationship between caring practices and the economic and human resources to which households have access has been overlooked. We believe that investigating this relationship

¹ Save the Children UK
will allow decisions on how to spend resources earmarked to improve caring practices can be better informed.

The study described in this paper is part of a wider body of work undertaken by SC-UK in Ethiopia which aims to assess current caring practices in the highlands, understand the reasons behind the caring practices observed and identify possible interventions which could improve caring practices. The objective of the research described here was to determine the extent to which caring practices, malnutrition, morbidity and caregiver’s knowledge are associated with socio-economic status as defined by the community within the project site. The work described here is quantitative – questionnaires were applied to households. Later work will be more qualitative and seek to find explanations for the findings of the quantitative assessment.

Method

Site selection

The study was undertaken in the woina-dega\textsuperscript{2} areas of Gubalafto woreda\textsuperscript{3}, North Wollo Zone in Amhara Region. The woina-dega communities in the North Wollo East Plain live between 1,500-2,200 metres and are dependent on rain-fed agriculture. Land holdings in this area are very limited. Most households own between 0.5-1.0 ha of land (average household size is 5) (SC-UK – North Wollo East Plain Food Economy Zone, 1999).

The woina-dega areas of Gubalafto were selected as the study site for several reasons. The most important is that the population living in this area is relatively typical of Wollo zone; they are not living in either the extreme high or low land. In addition, SC-UK has worked in Gubalafto for many years and currently has an office in Woldiya (the woreda centre). SC-UK has undertaken two food economy assessments in the woreda and our Nutritional Surveillance Programme systematically collected anthropometric and early warning data in this area for many years (SC-UK – North Wollo East Plain Food Economy Zone, 1999, SC-UK The results of community surveys in North and South Wollo, 1995).

Sampling

This study was not intended to be statistically representative of the areas studied. The purpose was to assess differences by

\textsuperscript{2} Woina-dega areas lie between 1,500 and 2,500m above sea level.
\textsuperscript{3} The total population of Gubalafto woreda was estimated at 160,000.
wealth group in selected Peasants Associations (PAs)\(^4\) which were representative of the agro-ecological zone. Households in the selected PAs were exhaustively sampled. Households with children under two were found by going from house to house in every village. A detailed local calendar was used to assess age.

Sample size calculations were based on the following equation (3):

\[
N = \frac{|u\sqrt{[\pi_1(1-\pi_1) + \pi_2(1-\pi_2)] + v\sqrt{2\pi(1-\pi)}}|}{\pi_2 - \pi_1}
\]

where,
\[
\begin{align*}
N &= \text{sample size for each group} \\
\pi_1 &= \text{proportion in first group} \\
\pi_2 &= \text{proportion in second group} \\
U &= \text{one sided percentage point of the normal distribution corresponding to 100\% - the power, for example if power = 90\%, (100\% - \text{power})=10\% and u=1.28} \\
V &= \text{percentage of the normal distribution corresponding to the required (two-sided) significance level, for example if significance level = 5\%, v=1.96} \\
\Pi &= \frac{(\pi_2 + \pi_1)}{2}
\end{align*}
\]

Based on previous SC-UK estimates of wealth groups in the study area, it was estimated that 1,500 children should result in 263 better-off children, 525 medium children and 712 poor children (SC-UK – North Wollo East Plain Food Economy Zone, 1999). This sample size allowed demonstration of a 10\% difference in the prevalence of malnutrition between each wealth group assuming there is a dose response relationship. Tests for trends in mean measurements require smaller sample sizes and hence the sample allowed us to detect smaller changes between mean anthropometric indices for the different groups.

**Variables**

Using participatory rural appraisal (PRA) techniques key informants, (village leaders, teachers, health staff, women’s group leaders and other groups’ representatives) identified different wealth groups in their community and defined the criteria for inclusion in each group. The wealth definitions included criteria related to asset

\(^4\) A peasants association (PA) is the smallest administrative unit recognised by the Government of Ethiopia. The population of the PAs in this study range from 5-6,000.
ownership, access to food, household composition, expenditure and income.

Having agreed the major characteristics of each wealth group, key informants then accompanied SC-UK’s data collectors to each household in order to discreetly identify its wealth status according to the predefined criteria. One key informant was responsible for identifying the wealth group of about 50 households.

Anthropometric measurements and clinical measurement of oedema were taken of all children under two years. A structured, pre-coded questionnaire was applied to the primary caretakers of the children. If either the primary caretaker or the child was not available at the first visit the team returned to the household later.

The questionnaire included questions on household characteristics, infant feeding practices, hygiene, health status, health seeking behaviour, vaccination status and maternal knowledge of hygiene, health and feeding practices. Maternal MUAC, age and pregnancy status was also recorded. The questionnaire was based on SC-UK’s previous experience with health education in the area (SC-UK: The results of community surveys in North and South Wollo, 1995). Wherever possible questions and indicators were consistent with international recommendations (4,2).

The questionnaire was field tested in advance of the study and modified where appropriate.

Data analysis

Data were entered, cleaned and analyzed in EpiInfo 6.04b-c upgrade. EpiInfo was used to calculate anthropometric indices. Flagged records (n=29) were excluded from further analysis.

A maternal knowledge score was created from the six questions concerning mother’s knowledge of hygiene, health and feeding practices. The score ranged from 0-6. The mean score was 3.2. This score was later divided into two – women with good knowledge scoring correctly on at least three of the questions and those with poor knowledge correctly answering less than three questions.

Proportions were entered into contingency tables and associations analyzed using Chi-squared. Where relevant the Mantel-Haenszel chi-squared test, and chi-squared test for trend were applied. Further analysis assessed the relationship between wealth groups and outcomes using multiple and logistic regression.
Results

Wealth ranking

The results of the community’s wealth ranking exercise were almost identical to those obtained by SC-UK in previous studies in the area (SC-UK – North Wollo East Plain Food Economy Zone, 1999). The most important factor identified for the better-off group was the ownership of at least one pair of oxen. Medium households were identified by having one ox and some other large livestock. The poor, apart from not owning any large livestock themselves, also included households without land, or households where the head was disabled, incapacitated or old and without support.

Table 1: Defining characteristics of wealth group as identified by the community

<table>
<thead>
<tr>
<th>Assets</th>
<th>Better-off</th>
<th>Medium</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxen</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Cows</td>
<td>2</td>
<td>1</td>
<td>1 (yerbee)</td>
</tr>
<tr>
<td>Calf</td>
<td>0-1</td>
<td>0-1</td>
<td>1 (yerbee)</td>
</tr>
<tr>
<td>Hefer</td>
<td>0-1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sheep</td>
<td>2-3</td>
<td>1</td>
<td>2-3 (yerbee)</td>
</tr>
<tr>
<td>Goat</td>
<td>2-3</td>
<td>1</td>
<td>2-3 (yerbee)</td>
</tr>
<tr>
<td>Donkey</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Chicken</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Involved in yerbee (looking after other HH’s animals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rent out their land and labour to richer HHs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract their land on annual basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Involved in daily labour and selling firewood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Landless HH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HH with disabled heads</td>
</tr>
</tbody>
</table>

Oxen are extremely important in this community as they allow a household to plough their land. Households who own only one ox must pair up to plough their land. Households who do not own any oxen must rent them of other households. Payment for the rental agreement is usually about 50% of the harvest yields. Thus the better-off groups receive not only their own harvest but a proportion of other households’ harvests too. The poorer groups, however, are often unable to obtain sufficient food to feed themselves given that land holdings in the area are so small and that they have to give so much away (SC-UK – North Wollo East Plain Food Economy Zone, 1999).
SC-UK’s food economy studies have found that better-off households have different diets, income and expenditure than poorer households. The poor households in Gubalafto are normally dependent on food aid for 25% of their food needs in an average year, whereas the better-off are able to obtain enough food for their needs. Previous research has also shown that poorer households have less money to spend on education, clothing, health care, food and other essential purchases (SC-UK – North Wollo East Plain Food Economy Zone, 1999; SC-UK – Assessment of the impact of food aid on household food economies in North Wollo, South Wollo and East Haraghe, Ethiopia, 02/2000, 11/2000).

Malnutrition and age

Graph 1 shows the relationship between malnutrition (<- 2 z-scores weight for age) and age. The relationship between malnutrition and age in the study population is typical of much of the developing world and very similar to the pattern seen in the recent Ethiopian DHS (2). The prevalence of malnutrition appears to level out at 41% at about 12 months. This rate of low WAZ is actually lower than the prevalence estimated in the DHS for Ethiopia as a whole. The fact that the survey was conducted at a time when food was readily available to most of the population may account for this.

Graph 1: The relationship between age and malnutrition (defined as <-2 z-scores weight for age)
The overall prevalence of low WAZ (<-2 z-scores) was only 3.2% up to the age of six months. A large increase in the proportion of low WAZ children is seen between 6 and 10 months. This is the time when complementary foods should be introduced to the children’s diets. Our results indicate that a relatively high proportion of women delay introducing complementary foods to their children until after six months in Gubalafto. Up to 20% of children are only receiving breastmilk until 10 months. However, this is also the time when children begin to crawl, and an analysis of the children in the 6-10 age group reveals that diarrhoea in the 24 hours prior to interview is the only factor significantly associated with the risk of malnutrition at this age.

Given the rise in malnutrition between 6-10 months, it is important that SC-UK and other agencies working in the area focus their efforts on improving the status of children at this age.

**Malnutrition and breastfeeding**

<table>
<thead>
<tr>
<th>Breastfeeding Pattern</th>
<th>Prevalence of Moderate Low WAZ</th>
<th>Significance of Chi-square Test (p)</th>
<th>Prevalence of Severe Low WAZ</th>
<th>Significance of Chi-square Test (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusively breastfed (n=312)</td>
<td>1.9%</td>
<td>&lt;0.01</td>
<td>0%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Not exclusively breastfed (n=67)</td>
<td>9.0%</td>
<td></td>
<td>4.5%</td>
<td></td>
</tr>
<tr>
<td>Predominantly breastfed (n=349)</td>
<td>1.7%</td>
<td>&lt;0.01</td>
<td>0%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Not predominantly breastfed (n=30)</td>
<td>20.0%</td>
<td></td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

Until the age of six months most of the children appear to be protected by breastfeeding. Those who were not predominantly breastfed were significantly more likely to be both severely and moderately malnourished than those who were. Exclusively breastfed children were also less likely to be malnourished than non-exclusively breastfed children.

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5 Infants who are breastfed but also receive water, water-based drinks (sweetened or flavoured water, teas, infusions), fruit juice, or oral rehydration salts solutions are defined as predominantly breastfed. No other liquids (including animal milks) or solids are allowed in this definition (4).

6 Infants who are only given breastmilk are defined as exclusively breastfed (4).
Almost ninety percent of the women interviewed for the survey predominantly breastfed their children up to age 6 months. However, significantly less mothers were exclusively breastfeeding after 3 months. Exclusive breastfeeding depends not only on a mother knowing that exclusive breastfeeding is best, but also on her being able to be with her child for enough hours a day to provide breastmilk continuously. Our results show that women who spent more than two hours away from their child were significantly less likely to exclusively breastfeed their children under six months than those who spent less time away from home (p<0.001). No relation between length of exclusive breastfeeding and knowledge of when to start complementary feeding exists in our data set.

*Wealth and nutritional status*

**Table 3: Means (and standard deviations) of anthropometric indices by wealth group in children aged 6+ months**

<table>
<thead>
<tr>
<th></th>
<th>Better-off (n=125)</th>
<th>Mid (n=374)</th>
<th>Poor (n=549)</th>
<th>All children (n=1048)</th>
<th>Significance of test for trend (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAZ</td>
<td>-1.557 (0.810)</td>
<td>-1.865 (0.971)</td>
<td>-1.871 (1.056)</td>
<td>-1.831 (1.005)</td>
<td>0.01</td>
</tr>
<tr>
<td>WHZ</td>
<td>-0.666 (0.580)</td>
<td>-0.861 (0.850)</td>
<td>-0.969 (0.829)</td>
<td>-0.895 (0.903)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>HAZ</td>
<td>-1.618 (1.383)</td>
<td>-1.840 (1.439)</td>
<td>-1.779 (1.648)</td>
<td>-1.782 (1.543)</td>
<td>0.38</td>
</tr>
</tbody>
</table>

**Graph 2: The prevalence of low WAZ according to wealth group in children aged more than six months**
Table 3 and graphs 2 and 3 show that wealth is significantly associated with malnutrition in children aged 6-24 months. There is a 10% difference in the prevalence of low WAZ (both severe and moderate) between the better-off group and the medium or poor groups. There is more than a three-fold difference in the prevalence of low WHZ between the better-off and poor groups. In fact, less than 2% of the better-off children are wasted.

The relationship between wealth group and stunting is not significant, although the direction of the relationship is the same as that described for WAZ and WHZ, i.e.: children living in richer households have higher mean nutritional status.

**Wealth and health status**

Table 4 shows that among children aged more than six months, the wealth of the household is significantly associated with children’s illness in the 24 hours prior to interview as reported by caregivers. Better-off households were less likely to report that their children had been ill in the past 24 hours.
Table 4: Relationship between wealth and other characteristics in children aged more than 6 months (proportions shown), chi-squared tests

<table>
<thead>
<tr>
<th></th>
<th>Better-off (n=122)</th>
<th>Mid (n=371)</th>
<th>Poor (n=543)</th>
<th>All HH (n=1036)</th>
<th>Significance of difference between rich and other groups (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child had any illness in past 24 hours</td>
<td>24%</td>
<td>32%</td>
<td>32%</td>
<td>31.0%</td>
<td>0.01</td>
</tr>
<tr>
<td>Household has soap</td>
<td>61%</td>
<td>38%</td>
<td>40%</td>
<td>42%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Household use soap more than once a week</td>
<td>52%</td>
<td>52%</td>
<td>31%</td>
<td>33.0%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Child drank milk in past 24 hours</td>
<td>32%</td>
<td>23%</td>
<td>15%</td>
<td>20%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother attended school</td>
<td>30%</td>
<td>21%</td>
<td>21%</td>
<td>22%</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Wealth and other factors

A number of other factors that could influence nutritional status and illness in children were also associated with wealth in this study. These included hygiene practices, feeding practices and educational status of caretakers. Households that were better-off scored more highly on all of these factors (Table 4). For example, better-off households were significantly more likely than poorer households to have a bar of soap in their home and also to use soap at least once a week. Additionally, children aged more than 6 months in better-off households were more likely to have drunk cow milk in the 24 hours prior to interview. The caretakers in better off households were significantly more likely to have been to school and to be able to read. They also scored significantly higher on the knowledge tests than medium or poor groups (Table 5).
Table 5: Relationship between wealth and other characteristics in children aged more than 6 months (means shown), chi-squared tests

<table>
<thead>
<tr>
<th></th>
<th>Better-off (n=122)</th>
<th>Mid (n=371)</th>
<th>Poor (n=543)</th>
<th>All children (n=1036)</th>
<th>Significance of test for trend (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal knowledge score (0-6 points)</td>
<td>3.7 (1.1)</td>
<td>3.2 (1.2)</td>
<td>3.2 (1.3)</td>
<td>3.3 (1.3)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Number of people living in the HH</td>
<td>6.3 (1.6)</td>
<td>5.5 (1.6)</td>
<td>4.5 (1.5)</td>
<td>5.1 (1.7)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

A further characteristic of better-off households was that they were significantly larger (Table 5). This could indirectly affect children’s nutritional status in several ways. Firstly, more labour is available in the household allowing more people to work off the farm and obtain additional income. Secondly, if a household is larger it may mean that caretakers have additional assistance in looking after young children. For example, a mother in a larger household may be able to send someone else to collect water or go to the market rather than do it herself. This could result in her spending more time with her child. However, larger household sizes may also negatively affect nutritional status: more people means more overcrowding and more mouths to feed. In general, however, household food economy studies have shown that households with more labour are better-off (SC-UK – North Wollo East Plain Food Economy Zone, 1999; SC-UK – Assessment of the impact of food aid on household food economies in North Wollo, South Wollo and East Haraghe, Ethiopia, 02/2000, 11/2000).

Nutritional status and other factors

Table 6 shows that children aged more than 6 months who were reported to have been ill in the 24 hours prior to interview were more likely to be malnourished than children who were reported to be healthy. Given the cyclical nature of the association between malnutrition and illness this finding is unsurprising [5].

During initial analysis, using chi-squared tests, in children aged more than 6 months low WAZ was associated with several factors other than age, illness and wealth. These included soap ownership and use and mother’s education. Mother’s maternal knowledge score was not associated with malnutrition, nor was drinking animal milk or household size.
Table 6: Relationship between nutritional status and other factors in children aged 6 months or more, chi-squared tests

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Prevalence of low WAZ</th>
<th>Significance of chi square test (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No illness</td>
<td>719</td>
<td>38.7%</td>
<td>0.005</td>
</tr>
<tr>
<td>Illness</td>
<td>317</td>
<td>47.9%</td>
<td></td>
</tr>
<tr>
<td>Did not attend school</td>
<td>808</td>
<td>43.4%</td>
<td>0.02</td>
</tr>
<tr>
<td>Did attend school</td>
<td>227</td>
<td>34.8%</td>
<td></td>
</tr>
<tr>
<td>Have soap</td>
<td>434</td>
<td>38.0%</td>
<td>0.05</td>
</tr>
<tr>
<td>Do not have soap</td>
<td>602</td>
<td>44.0%</td>
<td></td>
</tr>
<tr>
<td>Use soap more than once a week</td>
<td>357</td>
<td>36.1%</td>
<td>0.02</td>
</tr>
<tr>
<td>Do not use soap once a week</td>
<td>679</td>
<td>44.3%</td>
<td></td>
</tr>
<tr>
<td>Child drank milk in last 24 hours</td>
<td>208</td>
<td>37.1%</td>
<td>0.14</td>
</tr>
<tr>
<td>Child did not drink milk in last 24 hrs</td>
<td>828</td>
<td>42.6%</td>
<td></td>
</tr>
<tr>
<td>Mother scored highly on knowledge test</td>
<td>444</td>
<td>41.9%</td>
<td>0.90</td>
</tr>
<tr>
<td>Mother scored less well on knowledge test</td>
<td>578</td>
<td>41.5%</td>
<td></td>
</tr>
</tbody>
</table>

Multiple regression analyses

Table 7: Results of the multiple regression analyses. Coefficients and (p-values) shown, n= 1035

<table>
<thead>
<tr>
<th>Age of child (months)</th>
<th>HH Wealth (1=rich, 2=medium, 3=poor)</th>
<th>Maternal schooling (0 = no school, 1= school)</th>
<th>Maternal knowledge score (0 to 6)</th>
<th>Child's illness (0= not ill, 1 = ill)</th>
<th>Use soap (0= do not use once per week, 1= use)</th>
<th>Drink milk (0-6 number of times drink milk yesterday)</th>
<th>WAZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAZ -0.015 (0.006)</td>
<td>-0.111 (0.013)</td>
<td>0.218 (0.005)</td>
<td>-0.040 (0.005)</td>
<td>-0.187 (0.005)</td>
<td>0.024 (0.013)</td>
<td>-0.078 (0.005)</td>
<td></td>
</tr>
<tr>
<td>WHZ -0.054 (0.001)</td>
<td>-0.117 (0.002)</td>
<td>0.191 (0.004)</td>
<td>-0.030 (0.047)</td>
<td>-0.113 (0.047)</td>
<td>0.120 (0.036)</td>
<td>0.127 (0.240)</td>
<td></td>
</tr>
<tr>
<td>HAZ 0.000 (0.988)</td>
<td>-0.055 (0.328)</td>
<td>0.117 (0.228)</td>
<td>-0.022 (0.036)</td>
<td>-0.176 (0.038)</td>
<td>0.044 (0.603)</td>
<td>-0.041 (0.037)</td>
<td></td>
</tr>
<tr>
<td>Illness -0.009 (0.001)</td>
<td>0.036 (0.086)</td>
<td>0.022 (0.532)</td>
<td>0.012 (0.312)</td>
<td>-0.090 (0.004)</td>
<td>0.013 (0.445)</td>
<td>-0.040 (0.005)</td>
<td></td>
</tr>
<tr>
<td>Feeding milk 0.000 (0.923)</td>
<td>-0.136 (0.001)</td>
<td>0.141 (0.027)</td>
<td>0.038 (0.066)</td>
<td>0.030 (0.583)</td>
<td>0.000 (0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of soap 0.000 (0.854)</td>
<td>-0.044 (0.036)</td>
<td>0.147 (0.001)</td>
<td>0.063 (0.001)</td>
<td>0.013 (0.950)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 shows the results of multiple regression analyses. Child’s age, wealth group and maternal education remained significantly associated with WAZ and WHZ in multiple regression analyses. These variables are probably determinants of child malnutrition in this community.
Illness also remained associated with poor nutritional status in multiple regression analyses, but given the cyclical nature of the association between illness and health it is not possible to state whether illness determines malnutrition or vice versa.

In the multiple regression analysis WAZ was not associated with any hygiene practices, however improved WHZ was associated with using soap. It is possible to speculate that the use of soap reduces the risk of diarrhoea and hence impacts on nutritional status in this way.

The associations between feeding milk and the use of soap with wealth group and maternal schooling also remained during multiple regression analysis.

Discussion

The results described above are not complete because they represent the findings only of the quantitative survey. The qualitative survey should provide explanations of many of the findings described in this paper. Thus it is stressed that the discussion and recommendations presented below are preliminary only.

For children under six months, it seems that the most important factor associated with malnutrition is breastfeeding pattern. Our results indicate that the most important determinant of whether or not a child is exclusively breastfed is how long the mother spends away from the child. SC-UK needs to find ways to enable women to practice exclusive breastfeeding up to 6 months in terms of both education and time.

Above the age of six months, the wealth of the household is significantly associated with children’s’ illness status, feeding and hygiene practices in the household. This implies that wealth is an important determinant of the basic causes of malnutrition in Gubalafto. We feel that this is an important finding. Most of the previous work looking at the associations between malnutrition and poverty has looked at the relationship across different communities rather than within one community.

Our findings suggest that wealth affects many different facets of malnutrition and thus it will be important to consider the differences between wealth groups during any intervention to improve nutrition. Given that the vast majority of the households in this area are defined as poor or medium (80%), programmes aiming to improve the nutritional situation of this community must look carefully at interventions that can improve the situation for these groups, not only the better-off. Poorer groups may not benefit from
health, nutrition or hygiene education if they cannot afford to carry out the advice. It may be necessary to provide inputs to these groups in order that they can improve their situation.

One example is hygiene. Poorer households own and use less soap than richer households. Soap helps to prevent diarrhoea and hence malnutrition. Education around soap use may be useless if poor households simply cannot afford to buy it. Similarly, buying, or even making, ORS is not always possible for the poorest households. On the other hand, encouraging women to continue to breastfeed when their child has diarrhoea should be effective for all wealth groups.

Mother’s educational status is also associated with child’s nutritional status, illness, feeding and hygiene practices in the household independently of wealth. This result reflects macro-research from other parts of the world (6). Interestingly, the maternal knowledge score was not directly associated with nutritional status, although the score was associated with the mother’s educational status. We speculate that formal maternal schooling empowers women more than just giving them knowledge, possibly by allowing them to make more decisions in the household etc.

In conclusion, the results of this study indicate that both wealth group and maternal formal education play are strongly associated both with malnutrition and some of the causes of malnutrition. Thus we would support programmes providing formal education to women from all wealth groups. Given that wealth is mainly defined by food security in this community, it is clear that improving food security should be a priority for any agency wishing to improve the nutritional situation of children in this community.

References
CHILD-CENTRED CARE IN AFRICAN HEALTH CARE SYSTEMS: WHY IS THERE SO LITTLE OF IT? AND WHAT CAN BE DONE?

Pierre Blaise¹, Guy Kegels¹, Bart Criel¹

Introduction

Today, in many African countries the issue of quality of care at the level of modern First Line Health Services (FLHS) - public or private - is prominent. Huge efforts have been deployed in the eighties and nineties to 'revitalize' African primary health care systems. At the level of the first line, the focus has been on arrangements ensuring the provision of the necessary inputs (human, drugs, equipment, etc.) in the health care delivery process and, at the same time, on the rationalization of health care delivery in facilities staffed by auxiliary health workers (1). The sustainability of these policies benefited from the introduction of community financing schemes based on user fees, and on the management of these funds by local health committees. The Bamako Initiative (BI) launched in 1987 by the African Ministers of Health, the World Health Organization (WHO) and the United Nations Children Fund (UNICEF) has without doubt contributed to positive achievements in this domain (2). The operational integration in first line health services of preventive and promotional activities for mothers and children - the Expanded Immunization Programme (EPI), Antenatal Care (ANC) and Well Baby Clinic (WBC) including growth monitoring (GM) - was central in this strategy. Improvements were achieved in the accessibility of health care, in the range of services offered, and in the availability of essential drugs (3).

But today there is a standstill, sometimes even a frank decline, in utilization rates of modern FLHS. The coverage rates of preventive services remain low and the utilization rates of curative services hardly go beyond 0.3 contacts per year per inhabitant in many first line health services, even in 'revitalized' ones. Although there is no such thing as a golden standard when it comes to measure appropriate levels of utilization, these low levels indicate that there is a major problem in accessibility and acceptability of health care. The immunization rates increased sharply over 50%  

¹ Department of Public Health, Institute of Tropical Medicine, Antwerp
but the further increase required to achieve an epidemiological impact is much more difficult to obtain. In the Well Baby Clinic, the over-concentration on measurable targets, justified by a concern for efficiency, has sometimes led to poorly effective rituals. The number of health education sessions held, and thus the number of supposedly well-informed mothers has increased. So did the number of children undergoing regular weighing, at least until the age when they are fully immunized. But the outcome of these activities remains far below expectations (4). To add to this balancing view, there also is a growing concern for equity. There is increasing evidence that the poor have less access to essential services although they are the ones most in need.

A question therefore emerges: why is it that the population is increasingly ignoring these health services? What is happening? Why does the model of the “integrated health centre” not attract people? There is growing evidence pointing to problems in the human interaction between health workers and patients. The increase in the availability of primary health care services was not accompanied by an improvement in the quality of care offered. Evaluations and studies indicated that health services are often seen as hostile and aggressive vis-à-vis patients (5). If patients are given the opportunity to express their feelings, they say that they feel not listened to or heard. They feel that their views and opinions, their own explanations of what happened to them is not sufficiently taken into account (6). They claim that they are not seen as subjects, but rather as an object in a process that offers standardized responses to their complex individual problems. Sometimes, they even claim to have been the victim of aggression, insults and maltreatment. The question health services all over the world, both in the developing as in the industrialized world², need to address is what needs to be done to (re)situate the patient back at the very heart of the health services.

This paper presents an attempt to answer this question. We will concentrate on child health care and analyze the lack of child-centred care observed in African modern FLHS along three lines: i) the dimension of the clinical method that is practiced; ii) the dimension of the organization of health services and programmes; and iii) the dimension pertaining to the social and anthropological environment in which children, mothers and staff interact. In a first part we will introduce the concept of child-centred care. In a second part we will review the gaps between what is being practiced and

² The increasing success of alternative forms of health care witnessed in industrialised countries points to a lack of patient-centredness within the prevailing classical forms of health care delivery.
what would be a child-centred WBC. In a third part we will propose a comprehensive strategy to move towards a more child-centred approach.

What is going wrong? Lack of child centred-care

A lack of patient-centredness in child care is at the heart of the problem of quality of care

Patient satisfaction surveys indicate that public health services are often seen as delivering poor quality of care (7); a key element in that perception is the users’ dissatisfaction with the quality of the interaction between health worker and patient – also in situations where medical doctors staff the first line (8). The clinical consultation is indeed often conducted as a mechanistic process in which the patient is hardly listened to, and where her/his problem is purposely reduced to one or more physical complaints leading the health worker in charge to standard decision-making. Alongside the call from WHO for more responsive health services, efforts are currently being deployed to improve the overall quality of the patient-health worker interaction (9). These efforts tend to focus on (important) aspects pertaining to communication skills and practices, to attitudes of kindness, respect, and compassion vis-à-vis the patient, as well as on more down-to-earth issues like cleanliness of buildings and offices. This is laudable indeed, but not sufficient. Quality of interpersonal care cannot be merely reduced to solely increased patient satisfaction through better communication. Concentrating only on these aspects would constitute a missed opportunity for needed profound changes in the process of clinical care itself. Indeed, the emergence of the problem represents a unique opportunity to integrate the patient-carer interaction within a genuine patient-centred clinical method. Good communication per se is not an end in itself, but should be seen as part of a larger methodological process of patient-centred care where the patient is considered in her/his wider psychological, social, cultural and economic environment.

Indeed, a clinical method centred on the patient is not only more humane and acceptable, but would at the same time yield better results and be more effective. First line health services would also benefit greatly from this approach because they are the place where the initial contact takes place between health services and population; between professionals and patients (or potential patients) and their health problems. Moreover, it has a universal dimension. It would be a mistake to think that this is a luxury reserved for private institutions accessible to the privileged, or for
rich countries. But what exactly is meant by a clinical “patient-centred” method?

*Patient-centred care: a genuine clinical method*

Patient-centred care and thus also child-centred care is a concept which brings five key dimensions at the heart of health care activities: 1) a bio-psychosocial perspective; 2) the patient as a person; 3) the doctor as a person; 4) sharing power and 5) responsibility and the therapeutic alliance (10).

**What is a patient-centred clinical method?**

In the classical ‘biomedical’ approach, which is still the most prevalent approach in medical schools and teaching hospitals of industrialized countries, the task of the health worker consists in interpreting, decoding and translating symptoms and syndromes and to categorize the ‘crude’ complaints expressed by the patient under well-known nosological entities. Eventually, a course of action to be taken is proposed. The health professional thus follows a sort of sorting procedure leading to a diagnosis. He discards whatever is not relevant to his decision-making process. The dialogue, generally led by the health worker, consists of asking precise and generally closed questions in order to obtain further information which is not spontaneously given and which is necessary to his train of thought. He can then come to a diagnosis and propose a treatment. He even may conclude that there is an absence of pathology. In that case, the health worker can reassure his patient and explain him that there being no explanation for the pains, there is no need to worry. Of course, in spite of the sometimes ‘police questioning’ style this approach is not contradictory with a respect for the patient’s dignity, nor with a sense of compassion. Moreover, a kind and respectful attitude and a sense of communication on the part of the health worker contribute - this has been proven - to a better compliance. But a genuine patient-centred clinical method goes in fact a lot further than that.

In the domain of family medicine, Michael Balint first introduced the concept of a “patient-centred clinical method”. It was then further conceptualized by Mc Whinney (11,12) and also applied in a South African context to the postgraduate training of family practitioner specialists (13,14). The technique is based upon the health worker’s identification of clues offered by the patient during the history taking or the clinical examination. These clues are seen as opportunities for the patient to express all the dimensions (physical, psychological and social) of his problem. This is useful for
himself as well as for the provider who will integrate all this information in his clinical reasoning. During this process, the health worker tries to acknowledge and explore the different clues offered by the patient. He/she facilitates the discussion through open questions being as little directive as possible. In this way he/she can come to a more in-depth assessment of the problem. The aim of this interactive assessment is not to find a diagnosis but to come to a three stage assessment of the problem: i.e. a clinical level (the symptoms), a personal level (the patient’s experience), and a contextual level (the interaction between the patient, his health problem, and his environment). This mutual assessment will eventually lead to a plan negotiated between the health worker and the patient. This plan often, but not necessarily, includes a therapeutic dimension (Figure 1).

**Figure 1: The patient-centred consultation model (adapted from Fehrsen & Henbest 1993)**

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**Facilitation**

Patients’ agenda:
- Fears
- Suffering
- Disability

Facilitating and responding to cues offered by the patient

**Clinical reasoning**

Health Workers’ agenda
- History
- Clinical signs
- Investigations
- Diagnostic
- Treatment

**Negotiation**

Three stage assessment:
- context
- person
- disease

Negotiated therapeutic plan

Enablement
Between the classical biomedical approach and the patient-centred clinical method there is an essential difference. In the biomedical approach, the doctor-patient relationship basically serves the purpose to obtain an optimal participation of the patient in the diagnostic (accuracy of information) as well as in the therapeutic process (compliance). Eventually, it aims to achieve a satisfactory result according to biomedical criteria: that is to restore the patient’s good health - the latter being defined by the absence of any apparent disease. The patient-centred clinical method considers the health worker-patient interaction as a facilitating process aiming to improve the understanding of the problem by each of the two actors. A collective negotiation process about a mutually agreeable course of action then follows. These two processes, facilitation and negotiation, are such that they increase the patient’s capacity of facing his problem. They put at the patient’s disposal, if necessary, further information, skills and resources. This process relates to the concept of ‘enablement’ developed by Howie (15). Within this model the outcome of the consultation is no longer a diagnosis-treatment strategy, but a re-built capacity of the patient to face his health problem(s). The intended outcome is not cure per se, but rather an overall restoration of the patient’s capacity to properly function in his environment according to criteria defined by the patient himself.

A child-centred clinical method: the most important feature for child care to be meaningful

We have highlighted that one of the core elements of a child-centred approach is the importance given to the facilitation of the expression of the mother’s agenda. In his paper on routine growth monitoring, Garner states that there is insufficient reliable information to be confident that routine growth monitoring is of benefit to child health. In the same paper, commenting Garner, Davies suggests that an important spin-off of growth monitoring is the opportunity for mothers to ask questions about health issues (4). Bringing these three statements together, one can go on to say that if a well baby clinic, focusing on growth monitoring, is not child-centred, it may very well be irrelevant, if not harmful given the anxiety it may create. Introducing and developing the practice of a child-centred clinical method is thus pivotal if this kind of child-care activities have to remain meaningful.

Proposing an appropriate clinical method is not sufficient, the working environment must also change

It would obviously make no sense to consider the clinical patient-health worker encounter in a perspective where abstraction
is made from the broader environment in which it takes place. Hence the need to take into account the social and cultural aspects of the environment in which patient and health worker interact, the structural features of the health facilities, and the organizational characteristics of the health care delivery process. It is therefore justified, even necessary, to take into account two other dimensions next to the methodological one: a social-anthropological dimension, and a health services' structural-organizational dimension.

The first of these two dimensions concentrates on the social and cultural variables that may limit the patient’s demand for, and the health worker’s supply of patient-centred care. A patient may indeed not wish the health worker to take into account elements other than strictly somatic ones. The health worker her/himself may also resist engaging in a patient-centred relationship for a variety of reasons. The other additional dimension looks into the structural and organizational environment in which patients and health workers interact. An organizational set-up of health care delivery where activities are disintegrated obviously is not ideal for the implementation of a patient-centred and empathic approach (9). An excessive workload resulting from a poor planning of activities does not facilitate an open attitude both from health worker and the patient. The rigid application of diagnostic and therapeutic instruction also does not open space for participatory negotiation of a shared therapeutic plan.

We believe that the introduction and the promotion of child-centred care is not only a matter of participatory interpersonal communication, but also of its articulation with the process of clinical reasoning in a genuine child-centred clinical method. The latter in turn requires an appropriate organizational environment and takes into account possible social & anthropological factors that hamper or to the contrary foster such child-centred care (Figure 2).

**Figure 2: The tripod fostering patient-centred care**
Why is it going wrong? Organizational, methodological and socio-anthropological problems in the delivery of child care

In this section we will briefly review some of the most important gaps between what is actually the practice of under-fives' care and what child-centred care really would need to be. We will analyze this considering the three above-mentioned perspectives.

Organizational obstacles to child-centred care

The structural environment of the child/mother - health worker interaction is often user-unfriendly

At the core of our definition of child-centred care is the capacity to integrate the “patients’ agenda” in its full right in the clinical reasoning of the health worker. The way childcare services are organized in most instances does not foster such an approach. For example: growth-monitoring sessions are often sliced into pieces. One health worker is dealing with registration, another one with weighing, and yet another one with health education, etc. There is a chain-like division of the tasks to be performed for each single clinical case. A health worker, whose main required qualification is to be able to read and write, first registers the baby. Once the baby is weighed, it is taken for the control of its immunization status. Finally a short discussion is held, usually with the nurse in charge of the activity, to enquire about nutrition habits, potential risk factors and possibly prevailing acute disease. Eventually the child is discharged with an appointment for the next visit. It is not exceptional that a problem noticed at one stage of the chain will remain unnoticed at the stage where it should actually be dealt with. Too often, the mother is left with the challenge to make the necessary synthesis and to decide what the appropriate action is to be. It is obvious that this situation is not conducive to facilitate the mother to express her own (and her child’s) agenda even if such a task division may appear more efficient in terms of productivity (number of children seen per unit of time).

Another problem that is often raised by patients is the lack of privacy. Most of the WBC activities are carried out with a group of mothers like in the case of education and immunization sessions, again with the rationale of improving speed and efficiency.

There also is a problem of service availability and permanence. Preventive activities like immunization or growth monitoring can readily be organized on a periodical basis. This improves an efficient utilization of staff time and allows maximizing
the use of vaccines. This is probably not a problem for populations living close to the health centre as long as information is clearly displayed and communicated but not so for scattered and remote populations. For example: a mother walking many kilometres to attend a curative consultation for herself may simply be requested to come again another day for the immunization of the child she carries on her back. Conversely, a woman coming for the immunization of her child and requesting family planning may be told after waiting a whole day to come again at the next family planning session. Such incidents are unfortunately not rare. They not only constitute a wealth of missed opportunities to improve the efficiency and effectiveness of the health care delivery but they also are missed chances to improve the health services’ responsiveness to people’s demands and to increase the acceptability of the system as a whole.

There is not only a problem of permanent availability of the service, but also one of stability of staff. High staff turn-over between facilities, but also poor stability of staff in the different activities performed in one single facility (a given person performing immunizations on day 1, but running the curative consultation on day 2) is not conducive for the mothers and health workers to engage in a long term relationship. A mother will refrain from sharing with the health worker a delicate part of her own history if she anticipates having to disclose such sensitive information to different staff members at the occasion of subsequent visits. This represents once more an obstacle for the mother to express her own agenda.

One of the main reasons raised to justify the lack of patient-centredness is the lack of time due to the high workload. It is indeed very common to see long queues in front of health centres, sometimes very early in the morning even long before the doors open. The issue for many people is to arrive early enough to be first in the queue. Yet it is not uncommon to see empty facilities in the early afternoon and evening. There is clearly room to reorganize the intake of patients in order to spread the workload over a full day. Some simple rules to decide whom to see first, the introduction of appointment systems, and more clearly signalled pathways in the facilities could greatly improve the situation. Sometimes apparently disorganized activities may hide well organized systems of bribery (16). In such cases, attempts to reduce waiting times and to rationalize patients’ flow within the facility may interfere with staff’s own personal interests. Unveiling these “coping strategies” and negotiating acceptable alternative strategies with the staff is crucial if the introduction of change is to be effective (17).
In many countries, the development of health services puts a very strong emphasis on managerial issues. Supervision tends to focus too exclusively on (albeit important) administrative and logistical aspects like the quality of record keeping, the accuracy of the financial accounts or the effectiveness of drug stock control systems. It is common to plan field visits of supervisory teams during the least busy moments of the day so as to avoid “disturbances” by patients. The message that is thereby conveyed to the supervised is that administrative management is more valued than actually interacting with patients. This will certainly not foster the construction of the role model of a supervisor promoting and valuing patient-centred care.

Integrated care is an ill-understood and ill-implemented concept

Integrated care is an important characteristic shaping the quality of the health care delivered at the level of the first line. It has indeed the potential to make health services more user friendly and health care more effective and efficient. But the concept is often ill-understood and/or ill-implemented. A major misconception is that integrated care would be automatically achieved when different types of care (curative care, antenatal care, family planning, care for under-fives, etc…) are offered in one single facility. It is as if the mere existence of different types of care under one single roof would be a sufficient condition for care to be integrated – which is not the case. Integrated care, in fact, is an active approach where the health worker selects the type(s) of care that is (are) best for the patient. The health worker can either offer that care himself when possible, or he may refer to a colleague in his team who offers it, or he refers to a service availed outside his own facility.

Integrated care is an approach ‘cutting through’ all the different activities taking place at the first line (Figure 3). Integrated child care, for instance, refers to an approach whereby every single opportunity of contact between a health service and a child / patient / household / community is used in an optimal way so as to provide the under-fives with the care they need.
Some health care activities for under-fives may be structured within vertical programmes. This may have disruptive effects on the functioning of first line health services. Immunization programmes for instance, although they often claim to be entirely integrated, are usually piloted from a centralized administration and further channelled downwards. Vertical programmes are guided by a different logic compared to the one of primary health care services. They tend to focus on a limited range of quantifiable and thus measurable results. The priorities of the programme manager, the health worker and the family may be conflicting. A vertical programme manager tends to see his activities as having absolute priority and will strive to maximize impact. The manager of the versatile health care delivery system is confronted with the relative priority character of each single activity. He therefore tries to optimize care through the offer of a balanced packet of services. The offer of child-centred care also means that the child’s, the mother’s, and the household’s perspective need to be considered. This may entail an even more relative order of priority. Families, and more in particular poor ones, consider health as a relative priority to be balanced with other priorities like housing, schooling, clothing, etc. The order of priority that people establish will obviously vary over time and from one person to the other.

The necessary articulation between vertical programmes and primary health care services often is a difficult process. In many instances an operational integration of the activities has been achieved but without administrative integration. The routinely offered health care in a first line health service combines interventions and activities related to different programmes. But quite often the tools for monitoring and reporting remain specific to each single programme. Resources for some activities, like outreach immunizations for instance, are often earmarked and conveyed through specific channels. The health workers’ common sense, and his search for efficiency, will motivate him to take advantage of the
resources available for one particular activity to operate other activities not part of that programme. For instance some of the fuel available for Community-Based Growth Monitoring (CBGM) may be used for family planning outreaches, despite the fact that the programme of CBGM may forbid this. Hence, if a specific programme’s resource dry up for a reason internal to one programme, then other activities at the level of the first line may be jeopardized.

The setting of targets to be achieved often takes place under pressure of the managers of the different programmes. Annual plans then look like a juxtaposition of different programmes whereas they should be the balanced result of a comprehensive and participatory analysis of needs and a balanced package of activities. The incentives (financial and others) attached to the achievement of the specific targets of a specific programme of course influence the focus of the staff of the first line. It may imbalance the basic package of activities and decrease the overall acceptability of the first line health service while trying to increase staff’s responsiveness to some specific needs.

**What is there to be done?**

A variety of organizational changes can be proposed to change the way services are offered. The objective should be to arrive at a genuine integration of all activities relevant to decentralized versatile first line health services. It is beyond our scope here to review in detail what could be done; we will limit ourselves to a few examples. The patients’ flow may be reviewed, a more appropriate system of appointments may be useful to reduce waiting time during peak hours, the distribution of tasks may be altered with different job descriptions, etc.

A good example of such an approach has been reported by Bossyns (9) in Niger with Family Planning services. In a set of First Line Health Services, the experiment introduced a package of new operational instructions to actively propose family planning, integrated within curative and under-fives consultations, and coupled with measures to increase the health centres’ responsiveness to their clients. Patients procedures were made more flexible. Family planning services were integrated and special family clinics were abolished. Health staff was asked to systematically propose family planning to all eligible women presenting to the health centre and to engage in a respectful dialogue. Although earmarked family planning consultations disappeared, the number of new family planning acceptors and
other outcome indicators remarkably increased as a result of these simple measures.

We discussed in the preceding section that the delivery of integrated care goes beyond the grouping of activities under one single roof. It is a matter of both rational organization of the service and of an appropriate attitude from the health worker. In reality this may lead to a variety of practical arrangements. When different tasks are distributed among different staff in one team, then regular communication between team members will always remain essential. If different but related activities are spread among different structures, then co-ordination and efficient information systems are required. Last but not least, there will always be the need for an open and empathic attitude from the health worker allowing him to seize all opportunities for needed care.

Methodological problems in the consultation process

The extreme standardization of clinical processes leaves little room for facilitation or negotiation

Still today most of the first line health services in sub-Saharan Africa, but also in other parts of the developing world, are not run by medical doctors but by less qualified health workers to whom clinical and managerial responsibilities are delegated. The leading criterion for doing so is the possibility to standardize the task at hand. Indeed, if well designed, the clinical-therapeutic decision making process can be standardized to an acceptable level to reduce uncertainty and to allow health personnel with low qualification to address many complex clinical situations and to cover most of the health care needs (18). Care for under-fives, be it in the curative consultation or during preventive activities, is practiced in most first line health services within the boundaries of standardized instructions, flow charts and protocols.

The core of the practice of patient-centred care is the facilitation and negotiation process. The encounter between health worker and patient is expected to lead to a common assessment of the patient’s situation with regard to his health. If there is agreement about the existence of a problem, a plan of action is negotiated and agreed with the full participation of the patient (or his spokesman). It is clear that this model is conflicting with the expectation that staff should comply to a complete and precise set of instructions, guidelines and flow charts which link a given clinical observation to a given decision.

The initial experiences in African primary care services of standardization of procedures using flowcharts, beyond the
possibility to delegate complex clinical tasks, pursued two objectives. Firstly, the use of flowcharts was supposed to free the mind of the health worker from clinical reasoning which was hazardous as his competencies were limited, and to free consultation time so as to concentrate on the quality of the relationship with the patient. Indeed less qualified staff was expected to be in a better position to engage in an empathic relationship, being socially closer to his rural patient than would be a medical doctor. Secondly, the delegation of complex tasks to staff with limited qualification was considered as a means of human promotion. Delegation of tasks was seen as a motivation factor for staff (19). Regular supervision visits, training oriented, and carried out by senior practicing health professionals who were primarily responsible for the activities delegated and who had been closely involved in the design of the standardization of the procedures, was essential for the flexible use of flowcharts. The relationship between supervisor and the supervisee was characterized by the willingness of the former to take account of the difficulties met by the staff in applying rigid standards and by the openness and authority to adjust the procedures accordingly. In that perspective, it was expected that such a promotion of auxiliary personnel would gradually, and in the long run, upgrade them to a more professional status. Professional is here understood in the sense of a worker able to make independent decisions, based on his knowledge, and taken in the patients’ interests. Such expectations only materialized when all the above-mentioned conditions and enabling factors were present. Scaled up at large level, the approach has shown to lead to a range of perverse effects: all too often it has reduced the clinical encounter to a mechanistic ritual (20).

The challenge: articulating patient-centred care with compliance to clinical and health programme standards

The tension between patient-centredness and standardization needs to be resolved. Moving the swinging of the pendulum from extreme standardization to an attitude of laissez-faire in a context where professionalism is still lacking in many instances would lead to the loss of all the benefits of policies of standardization and delegation of tasks. The challenge is to arrive at an optimal articulation of the facilitation-negotiation process with the need for conformity to given professional standards. We should not throw the baby away with the bathwater. In Europe professionalism has been the sole quality assurance mechanism for centuries. Today the guideline industry is flooding health professionals with potentially useful, but hardly manageable, evidence-based information at the
point of health care delivery. In developing countries, guideline-based clinical management has been a safeguard in a system where professionalism was weak.

Technical considerations and recommendations should be brought in during the facilitation process as part of the doctor's agenda, and then be considered as an element of the therapeutic planning negotiation. In Australia, a patient-centred model has been developed that suggests best practice occurs when there is a fusion of knowledge derived from the best available evidence, clinical experience and knowledge of the patient's lifestyle and preferences and then consideration of the remote rural context (21). This model is probably also relevant to less resourceful health services. The presentation by Isabelle François during this conference, and which is reported in this book3, of an experiment with an interactive model of care shows that it is indeed possible to give more flexibility of decision making to nurse-practitioners. In this interactive model of under-fives care, the health centre nurse was free to choose what type of investigation and what type of management was appropriate for each child situation. The nurse had access to a set of guidelines to apply, according to his/her own assessment. In addition, the nurse was requested to systematically ask the mother two open questions on how she perceived her child’s health and her child’s growth. The results clearly indicated that the interactive model of care increases staff satisfaction and accountability, and that it improves the outcome of child health care.

Nevertheless, we should not be naive. A child-centred clinical method has definitely the potential to make health care more appropriate and more effective. It also has the potential to be recognized and valued by the staff practicing it. But it cannot be achieved overnight. The move from a biomedical to a biopsychosocial approach may also encounter strong resistance by the health personnel who may feel threatened and destabilized.

Social and cultural problems the health worker faces.

The existing role model of the health worker-patient interaction: more harm than good

The undergraduate training of medical personnel in most developing countries still focuses much on biomedical aspects. Hardly any post-graduate training programmes exist in the field of

3 François, I, Tonglet R et al. A randomised trial for the evaluation of a new model of routine child health care in Ouagadougou, Burkina Faso: the effects of changing practices and attitudes of health staff.
family medicine. For most junior doctors, ill-prepared to take responsibilities at the peripheral levels of the health system, high technology hospitals are perceived as the privileged working place, and a hospital specialist career consequently is the profile most valued.

At the best, the patient-health worker interaction model follows a paternalistic approach. This is even more pronounced when dealing with rural populations. Yet the interaction model most practiced is probably the authoritarian model. In the health care profession, the socialization of personnel by peers is a very strong mode of role modelling. Therefore it is not surprising that a patient-centred approach is not common if an authoritarian model is prevailing. It is further passed on from health worker to health worker.

The way supervision is usually being conducted also conveys a message and fosters role models that do not contribute to child-centredness. To the question “How do you make a nurse care for his patients?”, a South African family medicine professor answered “You care for him!” Ideally a supervision of health centre personnel should be supportive. It should address in an empathic way the various problems the team encounters in its daily work. It is striking how similar are the process of a patient-centred consultation and the process of a supportive supervision. Both are about facilitating the elicitation of clinical and managerial problems; both put the issues in a health policy perspective (evidence based medicine, programmes instructions and standards); both try to arrive at a common assessment of the problem and an agreement on the course of action to be taken. But in most instances supervision follows an authoritative style drawing on hierarchical relationships and conformity to procedures.

In many countries, the bulk of health services, especially preventive services and mother and child services are provided in the frame of public services. On the one hand, the identity of civil servants is more associated with the control of the population’s general hygiene than with the supply of a service to the public. On the other hand, their identity as health worker is probably associated with a compassionate model of caring. There appears to be a conflict between the social identity as a civil servant exercising control by the state and the professional identity as a health care worker. It is not clear why the former seems so often to overrule the latter.
A variety of socio-cultural elements interfere in the consultation process: a complex and contextual web

There may be good reasons for a health worker not to engage in a child-centred relationship. In a traditional hierarchical society a health worker may feel he does not have the legitimacy to discuss family related problems. A growth problem with an illegitimate child in an HIV high prevalence area would require a good understanding of the family context. Yet it would not be surprising to see a young unmarried nurse very reluctant in such a context to engage in an empathic relationship and to enquire into the family complex.

The boundaries of the therapeutic alliance are not necessarily easy to delineate. Especially when empathy in health care is not part of the usual behaviour of health workers. A nurse-practitioner may fear to get entangled in endless social obligations if he starts to be involved in the social dimensions of health problems. In Conakry, a local NGO (Fraternité Médicale Guinée) developed health centres with a strong social mission statement. At one stage, children consulted for long-standing physical disability. The health centre contacted an existing orthopaedic centre and children were provided with appropriate prostheses. Parents, children and staff did not stop at this stage though the clinical rehabilitation was achieved. The new emerging felt need for these children was one of social rehabilitation. An education project supported by the medical NGO was then created. This was possible because of strong social identity of the facility and because it had developed a network of partners supporting their initiatives. But this is an exceptional situation. In most instances, in the absence of support from a network of social services, it is not surprising to see health workers reluctant to open the “black box” of social problems. It is then (understandably) easier to stick to pure biomedical answers.

One of the comparative advantages of having nurses instead of medical doctors staffing first line health services was seen in the social proximity of nurses with their patients. But this does not automatically imply a more open attitude in the work situation. A career in the public service may be a means for the nurse-practitioner precisely to mark a social difference with the community he emerges from. In addition, there often exists a problem of ethnic differentiation because in some countries it is customary to post civil servants far from their community of origin in order to prevent attitudes of patronage. Moreover, as we mentioned above, we cannot take for granted that the dominant professional identity of the nurse is one of caring.

Health services in many countries are plagued with corruption. Health workers, like other civil servants, have developed
a variety of coping strategies to improve their living, taking advantage of their position. First attempts to describe and analyze this behaviour have taken place (20). They show that different forms of petty corruption are generalized. To some extent, the involvement in such coping strategies is part of the socialization process for the health workers and is justified by the low salaries they are paid. Some of these coping strategies remain rather neutral in terms of patient-health worker interaction: this is the case, for example, of the (ab)use health workers may make of the many opportunities for training workshops (17). But others strategies are clear forms of racketeering and are obviously conflicting with a patient-centred attitude. It will be useless to attempt any change in patient-health worker interaction, unless such behaviour is being addressed.

**Create a social climate that is favourable to child-centred care: fostering professional identity, raising accountability, deterring coping strategies and supporting staff**

Unless the many social and anthropological barriers to child-centred care are being addressed, one may expect resistance to change from staff. A comprehensive package of interventions of different kinds must be considered. First, a professional identity focusing on caring should be promoted. Second, alternatives to coping strategies that conflict with an harmonious patient-health worker interaction should be looked for. These alternatives should permit the staff to have a decent income and to restore morale. Third, strategies to increase accountability of health personnel towards the public must be proposed. Fourth, innovative approaches should be developed to create or to strengthen networks of social services to which the health worker can refer for further support. Fifth, support must be provided to the health workers to help them reflect on the difficulties they will undoubtedly encounter when they start engaging in more empathic and committed relationships. This could take the form of discussion groups of professionals. 'Balint groups' represent an interesting example of such discussion groups usually set up to provide psychological support to medical doctors. Experiments of discussion groups involving patients and health workers have shown effectiveness for structuring the social support to psychiatric patients in Guinea (22). These discussion groups gathering health workers could be structured as a forum where health workers can share their fears, their practical difficulties or successes, while at the same time building a culture of commitment and proactive behaviour in addressing their patients' demands.
Where lie the priorities? A research agenda

We propose to answer this question by raising three other ones. Firstly, where is the problem? Secondly, what are the determinants of the problem? And thirdly, what can be done to tackle the problem? What works and what doesn’t work?

Where is the problem? A general consensus on the lack of child-centredness probably exists

Descriptive surveys in many developing countries repeatedly pointed to the fact that today there is a major problem in terms of acceptability of health care delivery in modern health services, especially when the relational aspects are concerned. The past twenty years there has been a strong focus on the managerial aspects in the development of local health systems. This probably contributed to underestimate the importance of the interpersonal relationships in the provision of health care in general. Yet interpersonal relationships are known to be major determinants of quality in health care. In 1979 already Donabedian made the distinction between technical care and interpersonal relationship in the management of an episode of illness (23). This is even more relevant in situations where the relationship is not a binomial colloquium but where it consists of a triad ‘mother-child-health worker’. Little space, so far, has been given to participation and empowerment in health care programmes that target under-fives and older children. Empirical observations converge to the need to put child and mother’s perception, feelings and opinions at the very centre of the entire child-care process. This is consistent with the perceived lack of client-centredness and accountability towards the public in many public services in Africa. Further research to demonstrate this need is no longer a priority. It is now time to move forward.

What are the determinants of the lack of PCC? Need to investigate the complexity of this multidimensional problem

What is, however, still largely lacking is a thorough understanding of the precise determinants of this lack of patient-centredness. The mere training of staff in communication skills will not solve poor communication. As we pointed out earlier, child-centredness goes far beyond a mere technical issue. There is a need for an inventory, specific to each setting, of the various structural and organizational obstacles to the provision of child-centred care. The reasons for the rude staff behaviour vis-à-vis patients must be understood, unveiled, sociologically decoded and openly discussed.
in a non-judgmental way. Staff’s underlying coping strategies should be identified, addressed and possible alternatives explored. Eventually, more research is needed to develop a more appropriate (i.e. child-centred) clinical method, suitable in situations where there is no qualified medical professional, and which appropriately balances the need for conformity to professional standards with the need for responsiveness to the individual situation of each single child. This new development of the clinical method in African child-care must contribute to the promotion of more professionalism among the health workers.

What strategies work and what strategies do not work? Need to test multidisciplinary interventions aiming to promote child-centred care

We urgently need field trials and demonstration projects to test what works and what does not work. Innovative research programmes must be conducted to identify the most appropriate strategies to boost a more child-centred approach to child health. This research should build on multidisciplinary approaches. Acting solely on communication patterns or on managerial issues or on clinical techniques will not be sufficient. We should encourage a research framework that combines managerial, clinical and socio-anthropological approaches and that gathers field practitioners, public health experts, family medicine specialists and socio-anthropologists.

Positivist research approaches are unlikely to be appropriate for the investigation of the problem and for the identification and testing of possible solutions. Quality improvement techniques often follow a linear reasoning in search of a single root cause to tackle. This would mean considering the clinical interaction as a simple linear process. But the problem is clearly multicausal and relates to several domains and disciplines (biomedical, sociological, anthropological and managerial). The reasons for the lack of patient-centredness are as complex as the possible strategies to address it. We need to move away from naïve positivism and adopt a research and intervention methodology able to deal with complexity. Action research is one of the methodologies that have the potential to deal with complex systemic problems. But innovative approaches are most welcome in an area that is likely to become a major topic for health systems research in the years to come. Perhaps the principal challenge, since Alma Ata, in the promotion of appropriate child health care is to increase the responsiveness of child-care programmes and services through the implementation of more child-centred health care delivery systems.
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Introduction

There is a general consensus in public health and medicine that growth of children is a good measure of their physical well-being. When growth trajectories follow normative standards this indicates that children are experiencing adequate nutrition and health. In addition to a large body of data linking good nutrition to good growth, there is also substantial evidence that in early childhood better physical growth is associated with better psychological development, as assessed through tests of psychomotor, cognitive and social-emotional status. However, good physical growth does not guarantee good psychological development, and there is a considerable amount of research demonstrating the significance of supportive, responsive and stimulating environments in enabling children to achieve their psychological potential. Thus, an extensive body of empirical data, together with well-structured theoretical models, led to the proposition that integrated growth and development interventions are likely to be particularly effective in promoting child well-being.

In this paper we will address three questions that follow from this proposition:

- What do we know about the effectiveness of interventions to improve growth in conditions of endemic undernutrition?
- Is it a good idea to incorporate activities to improve psychological development in growth promotion interventions?
- What are the implications of integrating growth and development activities for programmes and for research?

In addressing these questions, we draw heavily on a review that was conducted by the Department of Child and Adolescent Health and Development of WHO, and which is available as a monograph titled: The Critical Link: Interventions for physical growth and psychological development (1). The review represents the work of a multidisciplinary team that included nutritionists.

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1 Division of Nutritional Sciences, Cornell University, Ithaca, NY
2 Child Development and Nutrition, UNICEF, New Delhi, India
epidemiologists, psychologists, anthropologists, as well as policy science experts.

To prepare the review evidence was collected from many sources, ranging from published articles in peer-reviewed journals to programme reports, papers and educational materials. The data on impact of interventions come from two main types of studies: efficacy trials and programme effectiveness evaluations.

Efficacy trials typically utilize an experimental design in which the intervention group receives the treatment while a comparable control group does not. Some of the efficacy trials are, in effect, clinical trials in the community, while others are designed in such a manner that they are, actually, a test of real world efficacy with a best case scenario -- because they use a delivery system that either potentially feasible or is already in place. In a well-designed efficacy trial investigators work hard to ensure that the intervention is delivered under the best possible circumstances. Efficacy trials are reported primarily in refereed journal articles and in review papers. The second main source of data was programme evaluations, Some of these evaluations also appear in journal articles and reviews. Some were available only in the so-called grey literature of programme documents. These also cover a range from small-scale pilot projects that closely resemble efficacy trials to evaluations of large-scale multi-site programmes.

What do we know about the effectiveness of interventions to improve growth in conditions of endemic undernutrition? Over the decades there have been a number of different types of research and programme activities to promote physical growth in conditions of endemic undernutrition. These different types were classified as follows:

- Supplementary feeding of pregnant and lactating women
- Supplementary feeding of children under five years of age
- Rehabilitation and feeding of undernourished children
- Correction of nutrient deficiencies (multiple and individual)
- Nutrition education to improve breastfeeding, complementary feeding
- Production of special complementary foods
- Growth monitoring and promotion

Within these broad categories, one can also create subdivisions based on the mechanism by which the intervention is delivered. For example, types of interventions to address micronutrient deficiencies include: food fortification, nutrient supplements and capsule distribution, food-based programmes, and special focus nutrition education activities.
Another set of examined interventions are activities that address more distal determinants of poor growth. These include: water and sanitation interventions, control of disease through medical services and immunizations, interventions to increase household food security (eg through food subsidies, food for work programmes, agricultural production and credit programmes) and interventions to increase maternal education, delay childbearing and increase birthspacing.

What can be concluded about effective interventions from this large body of information?

With respect to the direct, nutrition-related interventions, one can say:

- Most interventions work some of the time.
- No interventions work all of the time.

Other broad generalizations that can be supported with empirical data include:

- Interventions during the earliest period of life – pre-natally, during infancy and early childhood – are likely to have the greatest impact.
- Greater effects are usually seen with interventions of longer duration and higher intensity. However, positive effects of short-term interventions, particularly with micronutrient supplementation, have also been demonstrated.
- The children in greatest need are generally the ones who show the greatest response to growth interventions.
- Programmes that use several types of interventions and more than one delivery channel are more efficacious than those that are more restricted in scope.
- Programmes that address distal determinants of nutrition (eg. Immunization, water and sanitation) can be effective in reducing malnutrition when they are accompanied by nutrition and health education activities.

Beyond this very general level, it is not possible to specify which types of interventions are more effective. In part this cannot be done because comparisons among the many different kinds of intervention activities are not easy to make. Certainly, efficacy and effectiveness studies are not comparable and available data do not permit systematic examination of different interventions internal to these two broad categories. Moreover, differences in the methodological quality of studies across the range of efficacy and effectiveness designs also constrain the possibility of making useful comparisons. Apart from technical problems, the most important reason that it is difficult to make blanket statements about the
relative effectiveness of different types of interventions is that they are always **context specific**. They are context specific with respect to the biological context, the environmental context and the socio-cultural context.

With the biological context the locus of the intervention is the individual. There is an increasing body of scientific knowledge documenting the significance of such biological context characteristics as how an individual’s degree of nutritional deficit or how characteristics of diet affect biological responses to nutrition interventions. The influence of the environmental context, which affects both individuals and populations, includes such factors as endemic parasites and poor sanitary conditions.

The socio-cultural context of interventions has multiple influences on their potential effectiveness - on individuals, families, and communities. Beginning with the most macro-level of social policy and political conditions, examples of the types of context factors that affect the impact of interventions include the presence or absence of specific national policy instruments and international and donor funding priorities. Context factors at the political level include public support for particular kinds of interventions and the social orientation of political leadership.

The administrative and programmatic context is a significant factor in intervention outcomes. Among the characteristics that may be influential are:

- The organizational structure of government agencies;
- Level of development and co-ordination of NGO activities;
- Educational, skill levels and motivation of staff;
- Performance incentive structures;
- Efficiency of procurement procedures; and
- The complexity of participation procedures.

The characteristics of social systems and social structure at community level, as well as differential economic resources at the level of communities also have major influences on the effectiveness of interventions. For example, features of community infrastructure, such as transportation and education facilities, as well as social barriers produced by caste and class differentials may all influence interventions. At the micro-level of socio-cultural context are the profound influences of such familiar factors as intra-household food distribution, cultural beliefs and child care practices.

The influence of context factors on the effectiveness of growth promotion interventions is so great that developing strategies for understanding these factors and for working with them in the planning and implementation of programmes is fundamental to their success.
Is it a good idea to incorporate activities to improve psychological development in growth promotion interventions?

The arguments for joint or integrated growth and development interventions fall into two categories: theoretical/scientific and practical.

At the scientific level, there is a large body of empirical data and sound theoretical models that show a very close linkage between physical growth and psychological development, particularly in early childhood. The process that produces growth faltering also produces delayed development. Some of the delay in psychological development, particularly in motor skills, appears to be mediated by delayed physical development. Simply improving nutrition improves development, even without any other intervention. However, one should not conclude that the positive effects on development of improving nutrition are due solely or even mainly to biological mechanisms. Malnutrition in children, as in other animals, has behavioural effects, such as reduced activity and increased emotional reactivity, which compromise the individual's ability to interact with his or her environment in ways that affect development.

Three efficacy trials that used both nutrition and psychological development interventions in conditions of endemic undernutrition provide important empirical data to evaluate the impact of combined interventions. All three studies found that a psychosocial intervention led to significant improvements in psychological development, and the nutrition intervention had positive effects on growth. Two of the three studies found that the combined interventions had a greater effect on psychological development than either intervention alone, and one study showed that the combination of nutrition and psychosocial activities had a greater effect on physical growth than either one alone.

There is other research that points to the relationship between nutritional status of children and care-giver behaviour. A healthy, well-nourished child is better able to elicit care-giving and to profit from environmental stimulation. On the obverse side, there is a tendency for dysfunctional feeding and dysfunctional interaction patterns to occur in the same families. Thus, increasing caregivers' skills may enable them to provide not only improved nutritional care, but also improved psychosocial care. Helping caregivers to undertake child feeding and other care practices in a responsive, stimulating fashion is likely to result in social and cognitive as well as nutritional improvements.

In short,
theoretically-based arguments for improving parental care-giving as a strategy for improving child well-being point to the potential value of integrated growth and development interventions.

At the practical level, there are a number of potential advantages to the incorporation of child development activities into nutrition interventions. To date the majority of child development interventions have been organized under the rubric of early child development and care (ECCD) and have been directed to the older pre-school child – usually from ages three to five. In contrast to the multiplicity of early intervention programmes for nutrition in countries with high rates of undernutrition, programmatic activities for very early interventions for development are much less common and the structural arrangements to support them are not as well established. Including development concerns in nutrition activities is one mechanism for moving toward truly integrated programmes.

The negative effects of poverty on child well-being means that the children who are at high risk for undernutrition are also those who are most likely to benefit from development interventions. Given the difficulties of outreach to those most in need, it makes sense to provide integrated services once the efforts have been made to establish contact and motivate participation.

For parents combining nutrition and development activities may be particularly motivating. One of the serious challenges that nutrition interventions have faced is that preventing mild to moderate undernutrition is not usually a priority for families because the level of malnutrition that results in growth stunting, without overt clinical signs, is rarely perceived to be a problem. On the other hand, parents are generally very interested in promoting cognitive development of their children, particularly as societies become more technologically developed and school success gains importance. Linking nutrition and development activities may, therefore, be more appealing for parents and, as Caulfield et al (15) have noted, one element that is associated with the programme success is the linking of activities to parental aspirations.

At the programmatic level, integration of nutrition and development activities (whether through incorporation of the latter into nutrition programmes or through new, integrated formats) is likely to result in cost savings, through efficiencies in materials, training and personnel. Materials that deal simultaneously with child feeding, care and educational practices have been created by some programmes around the world, and personnel have been trained to use them. However, most of these efforts are small-scale and have not been adequately evaluated. Thus, while it is reasonable to expect cost savings, presently available data do not permit a quantitative, empirical demonstration of this proposition.
Apart from administrative efficiencies, there may be other benefits to integrated programmes in terms of job satisfaction for frontline workers. Motivated by a desire to help families in need, front-line workers may find it intrinsically rewarding to be able to offer an integrated set of services to clients facing multi-dimensional challenges, rather than being restricted to a narrow programme focus. For example, Community Nutrition Educators (CNEs) in a nutrition programme for low income families in the U.S. expressed strong belief in the value of their programme because they were able to go beyond teaching nutrition to help programme participants with issues such as parenting and child-feeding practices, family relationships, and the development of self-worth and self-confidence. CNEs were motivated by an interest in caring for “the whole person” and felt that this was facilitated by the breadth and flexibility of programme content (16). Among these workers, valuing the programme was strongly associated with high levels of job satisfaction (17). In addition, the job of a front-line worker providing integrated services is likely to include greater variety, a factor known to be related to worker motivation (18), as well as opportunities to develop new knowledge and skills.

What are the implications of integrated activities for programme development and for research?

In the previous section some of the advantages of combined nutrition and child development activities were mentioned from the perspective of programmes and families. However, there will also be significant social and organizational challenges.

At the level of the family there are constraints on the amount of time and resources that are available to care-givers, especially mothers, and other family members. Programmes must take care not to over-burden them with additional tasks that make child care more time-demanding, and it may be necessary to create additional support structures to prevent this.

It is essential that programmes do not fall into the trap of making parents feel guilty or at fault for deprivations that arise from conditions in the environment. Both Richter (19) and Myers (20) have pointed out the potential for disempowering parents through the creation of alternative care structures. Combined interventions need to take steps to avoid a similar danger with home-oriented activities. Without thoughtful attention to this potential it would be possible for programmes to create feelings of inadequacy on the part of parents and other care-givers.
An important challenge for the development of integrated programmes is how to deal with issues of coordination across departments and agencies. Existing structures may need to be altered and activities within these structures will inevitably be affected. Sensitivity to the problems that are created by such structural and organizational changes is the first step and careful planning to resolve problems as they arise will be essential for effective programme development.

Another challenge that programmes need to be aware of as they move toward integration is the likelihood that different components of programmatic activities may be differentially successful. As described above, the ways in which contextual features can affect interventions is very complex. As a result, some elements may be more readily accepted or easier to implement than others. Programmes need to guard against the possibility of internal dissension if this occurs. They also need to be prepared to deal creatively with external criticism and the potential for loss of support for a larger programme when some elements are not as popular or do not get implemented as easily as other elements.

At the programmatic level, integration inevitably presents special challenges with respect to a number of administrative concerns, including the need to avoid overloading the supervisory and management system, as well as facilities. Most important are the effects on frontline workers. A fear of putting undue stress on community-level workers and exceeding their technical capacity has been one of the main elements of the rationale for vertical programmes. It would clearly be counter-productive to sacrifice the quality of activities at the community level in order to achieve integration. To avoid these negative consequences will require new tools, curriculum guides, and training procedures and careful monitoring and supervision. To that end, we propose a series of procedures that are intended to facilitate the process of creating and implementing an integrated growth and development programme.

**Steps toward an integrated growth and development programme for communities with endemic under-nutrition**

- Develop a generic counselling package, which can serve as the basic template for programmes. Together with the generic materials there must be clear guidelines for what needs to be done to adapt it to local cultural and environmental
conditions, including suggestions on strategies and procedures for this process.

- Identify potential mechanisms and channels for delivering the package. (These may include existing growth promotion programmes, existing child development programmes, breastfeeding programmes, community health worker outreach activities, community organizations, health service contacts.)
- Develop guidelines for working with community organizations and involving families in the development of the programmes, including local adaptation.
- Develop guidelines for identifying families who need additional supports in order to implement recommendations and procedures for facilitating these supports.
- Develop tools to facilitate the delivery of the integrated counseling package, including guides for training and retraining monitoring and supervision.
- Develop evaluation tools. As with general guidelines, these need to be locally adapted, including the methods that are used to assess child development.

The effective operationalization of the procedures we have outlined above dependent on large sectors of knowledge, most of which are only partially available at present. In the absence of a fuller understanding, the options are to wait until the knowledge base is better developed or to proceed, while at the same time working to build such knowledge. Keeping in mind the underlying principle to “do no harm,” and with the appropriate cautions that this principle enjoins, it appears likely that the latter course is preferable. However, it is important to work simultaneously to improve the knowledge base. This can be done, on one hand, through studies associated with programme implementation, and, on the other, with efficacy trials and other basic research to address critical gaps in knowledge. Among the questions that need attention are the following:

- What are effective approaches for giving families information on child needs and how to meet them? How do these vary in relation to cultural context?
- What are effective techniques for building care-giver skills? Does the use of modeling and culturally appropriate communication facilitate skill acquisition?
- What are the major constraints to “responsive care-giving” and what mechanisms are most effective in overcoming these constraints?” (eg. What is role of care-giver time allocation and availability, self esteem, control over resources, etc.)
Addressing these and other questions concerning the determinants and mechanisms that favor or constrain responsive care-giving in the contexts of poverty and undernutrition will require the investment of economic, institutional and intellectual resources. One of author’s conclusions from carrying out the review process is that there is a need for much greater research attention to fundamental questions about how to support child well-being and meet child needs in the difficult conditions that many of the world’s families face. In addition to the investments that are made to alleviate or modify these conditions and their effects, greater investments in research that would permit more effective use of these investments is essential.

Acknowledgments

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Introduction

Although the serious problems of malnutrition in developing countries have not changed very much over the last 40 years, we have seen each decade, or so, a new panacea, or paradigm, or magic bullet, which is claimed, will greatly reduce prevalence by a targeted date. Between 1955 and 1965 protein deficiencies were seen as the major problems and products such as fish protein concentrate, single cell protein and cereals fortified with amino acids were offered as magic bullets. In the 10 years from 1965 after the "protein fiasco", Nutrition Rehabilitation Centres and Applied Nutrition Programmes were offered as sure solutions. For a decade from about 1975 malnutrition was viewed as needing macro changes, and first nutrition planning and then nutritional surveillance became the dominant strategies while economists and planners began to replace paediatricians and nutritionists as the principal architects of new policies, with much talk of poor nations achieving national food security. In the period beginning in the mid 1980's we saw the IMF, influenced by Reaganomics, push structural adjustment and market economics, while WHO and UNICEF reinvented Applied Nutrition Programmes (ANP’s) which they renamed Joint Nutrition Support Programmes (JNSP’s). Most recently the major concentration has been on micronutrient deficiencies, also termed "hidden hunger," some of which allow agencies to concentrate on “quick fixes” while ignoring the underlying causes of malnutrition (1).

Although many of the interventions were aimed mainly to address serious problems of malnutrition, most were recognized as aiming also to improve growth and development of children even if this was not the main stated objective. Through almost all these years, in one form or another, growth monitoring (GM) of children has been practiced, and often has concentrated on weighing and charting, rather than growth promotion. GM has a long history (2) of enthusiastic advocacy and even bloated rhetoric, despite the fact

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1 Professor of International Nutrition, Cornell University, Ithaca, NY 14853, U.S.A.
that there is little scientific evidence to prove its effectiveness as commonly practiced. Aspects of growth promotion using information from the mother, the community and local health workers have been relatively ignored. There is often a false assumption that the mother is lacking more in knowledge and in desire to care, rather than in resources and time; and that she has access to reasonable health care, when all too often the health care system is dysfunctional. Throughout much of the period, and especially in recent times, very little is being done to reduce poverty, and especially inequity, yet these are the very root causes of malnutrition. Nutritionists have seemed unwilling to advocate revolutionary policies needed to reduce malnutrition which include improving equity, changing the economic order, and taming globalization, while promoting universalisation of human rights including rights to adequate food, health and care (3). Through all these years external funds targeted for development, including for nutrition and health, have not been well spent. A very large proportion benefits the donors, plus the well remunerated persons who they support, and a rather small proportion has reached the intended beneficiaries.

Recently, with the pandemic of HIV/AIDS which has devastated many African countries, and is now marching relentlessly into South Asia, most nutritionists seem to have largely abrogated HIV’s contribution to malnutrition to virologists and AIDS specialists. We see a huge mushrooming of NGO’s concentrating on HIV/AIDS and in some cases a weakening of NGO’s whose mission has traditionally been to address malnutrition, child health and infant feeding in developing countries (4).

Reasons for inadequate success in improving growth and development

Looking historically at actions promulgated over the past 40 years to control malnutrition in the developing countries of the south leads to the conclusion that we have been much less successful than was hoped, and it is important to search for reasons for this relative failure. The variable, but in general disappointing, reduction in childhood malnutrition manifested in the form of stunting and underweight can be laid at the door of many players. These include the governments of developing countries; the world economic order (or disorder) wedded to the marketplace and recently to super-capitalism with power shifting from governments to giant transnational corporations (TNC’s); many non-government organizations (NGO’s) which often base their
programmes on prevailing nutrition fashions and which, of necessity I suppose, follow the money which may be tied to interventions which may not be optimal; professionals, both academic and field based, who often have influenced, and then supported, changes in direction in the dominant actions to control malnutrition even if these are not evidence-based; and UN and other international agencies who despite ACC/SCN have often been disunited, and too often embrace quick fixes while not addressing the basic causes of malnutrition related to inequity, poverty and national debt. Almost all these players have concentrated much more on reducing infant and young child mortality, than improving the health and quality of life of the survivors. The clear evidence that mild or moderate malnutrition manifested as stunting and underweight contributes so importantly to child deaths (5) should serve as an added rationale for concentrating resources and actions on prevention of malnutrition, by maintaining good growth and development.

My thesis is not that the dominant interventions of past decades had no validity, but rather that they were not panaceas to end malnutrition and often they were not evidence based. They were often more curative than preventive. There has been too little recognition that malnutrition, as well as IMR, are adversely influenced by inequity, and that over the last three decades many poor people have become poorer, and rich people richer; and that inequity has increased almost everywhere both north and south.

But returning to the dominant nutrition interventions of previous decades, I believe that all had some valid basis, and all still have some place in our armamentarium of actions to reduce malnutrition. But none were, and none are, panaceas. Very often the stated targets were unrealizable; the promises of what would be achieved were empty; the manner of their implementation was flawed; and most importantly the claims were not evidence based. The answer then is to take from each of these intervention strategies those aspects that work and have been proved effective, to add new actions based on new evidence, and then to co-ordinate a rather broad set of interventions into a more coherent whole, while addressing the very serious underlying causes of malnutrition including inequity and poverty.

It is clear that protein deficiency is not the main cause of malnutrition in the world (6), but protein remains an essential macronutrient. The pendulum may have swung too far, where protein rich foods such as legumes and small amounts of animal based foods are not now adequate in the diets of many children in disadvantaged families in developing countries. The importance of small intakes of heme iron is being increasingly recognized. So
consumption of some protein rich foods is important but single cell protein and amino-acid fortification of cereal flours are not the answers.

Nutrition Rehabilitation Centres as originally promulgated were not a bad idea, but advocating them, as a strategy that would markedly reduce the high prevalence of malnutrition worldwide was exaggerated rhetoric. An evaluation of Nutrition Rehabilitation Centres in Haiti and Guatemala clearly showed this (7). In the 1960’s and 1970’s in Haiti, a great deal of outside support including NGO assistance was directed at control of prevalent malnutrition and much of this relied on NRC’s. Just as with GM activities, NRC’s can only be successful in preventing malnutrition if the educational component is effective, but like GM this aspect has often been its reason for failure.

The report on the evaluation of NRC’s in Haiti and Guatemala has these final comments:

- The conclusion can be reached that Nutrition Rehabilitation Centres are, in general, having a favourable effect on the growth of a majority of children while they are being regularly fed at the centre, but that they are having rather small effect on these children after they return home. The reasons for this are probably several and many can only be surmised.

- It is evident that in the centres included in this study the education of mothers is not as effective as might be hoped. This is probably because (a) much more attention by staff is given to feeding and caring for centre children than to education of their mothers; (b) the nutrition and health education is often unrealistic in terms of what is feasible in the homes (i.e. too much stress on animal protein sources rather than legumes) and (c) a significant proportion of families using the centres are too poor to make the necessary improvements in the diets of their children.

But this is not to conclude that for example a well run NRC connected to a crowded hospital cannot be successfully used to shorten hospital stay and reduce costs for children admitted with severe nutritional marasmus or kwashiorkor, and NRC’s are still claimed to play a useful role in Haiti (8). But there must be recognition that NRC’s will not play the major role in reducing malnutrition.

Nutrition planning in vogue in the 1970’s and nutritional surveillance separately in their own way can play relatively important roles for countries aiming to reduce the prevalence of malnutrition. They can for example provide strategies to improve national and household food security and to put in place a response
to food crises. But the goals of achieving national food security, so much advocated two decades ago, seem to have been swept aside by GATT, the Uruguay Round, WTO rules, and the embrace of free trade aspects of globalization. Developing countries whose economy is agriculturally based can be prevented by WTO from implementing policies, which favour locally produced foods, and place tariffs on imported cereals. Economists and planners still have an important role to play in assisting with policies aimed to improve food security and reduce poverty. But planning is not a panacea.

By the mid 1980's the nutrition planners influence declined and they were sidelined, not by nutritional scientists and child health specialists but by international economic forces. Super-capitalism arising out of Reagonomics was followed by structural adjustment policies of IMF and a decline in support for social services including health, education and fair wages. IMF policies may have contributed to improvements in the economies of some countries, especially middle income countries. But structural adjustment, and related policies, also contributed to a widening gap between rich and poor, which always aggravates rates of malnutrition. As time went on huge debt repayments were worsening the economies of many countries. In several nations in sub-Saharan Africa, all this has made access to health care and to education more difficult for the poor. And few nutritionists would disagree with the premise that adequate health care for children and female education is fundamental to improve nutrition and growth and development of children.

Applied Nutrition Programmes (ANP's) supported by FAO, WHO and UNICEF in the 1960's and their "reinvention" in a modified form as Joint Nutrition Support Programmes (JNSP's) in the 1990's (9) both had components which are important to improve nutrition at the local level, and their attempts to co-ordinate activities in the areas of health, agriculture, education and social services make much sense. But with the exception of the JNSP in Iringa in Tanzania (10) few really demonstrated that they could substantially reduce the prevalence of malnutrition, including stunting and underweight. Did JNSP's concentrate too much on badly implemented GM and the use of inappropriate nutrition education? Much of the education assumed that the main problem was that mothers were ignorant and only needed information, little education was based in learning from mothers, understanding their difficulties, and appreciating that much of the malnutrition was poverty related. Despite considerable interest in the use of a positive deviance approach, this was little used in the JNSP in most countries.
What should have been participatory action, seldom was. But many of the components of both ANP's and JNSP's have real merit, and participatory actions based on adequate recognition of local situations and culture, could contribute importantly to reducing poor growth and development in children. The introduction of a conceptual framework (9) recognizing that adequate food, health and care are all essential to prevent malnutrition has proven very useful.

The 1990's ushered in a concentration on actions designed to control micronutrient deficiencies (11), and especially the Big 3 – namely Iodine Deficiency Disorders; plus iron and vitamin A deficiencies. Recently zinc deficiency has received much attention, but more in the area of research and speculation, rather than programmes and policy. Moving away from the difficulties in attempting to control stunting and underweight, to concentration on micronutrient deficiencies was a very enticing shift for donor agencies, NGO's, academics, and others. This allowed efforts to be made to provide magic bullets, and quick fixes; actions that could be designed in the north for implementation in the south; and there were, and still are hopes of massive financial support. The governments of many non-industrialized countries were easily persuaded to embrace this new focus on malnutrition. It has been very attractive for almost all the actors to appear to be very concerned, and active in controlling malnutrition in developing countries. But in fact while addressing important deficiencies, many are ignoring the major form of malnutrition in these countries, and their underlying causes. These include inadequate intakes of food, problems related to maternal and child care; and an environment conducive to disease, and with poor access to decent health care; all leading to poor growth and development of children.

This is not to say that interventions to control micronutrient deficiencies are not important. The most successful intervention, namely iodination of salt, has been highly beneficial, and when successfully implemented has almost certainly had a major impact on improving psychological development of affected children (12), and in reducing cretinism, one of the most hideous manifestations of malnutrition. Despite all the targets set very few countries have programmes or policies now in place that are likely greatly to reduce nutritional anaemias which remain extremely prevalent and constitute very important health problems.

To what extent does current concentration on reducing micronutrient deficiencies, which are now labelled "hidden hunger", in fact lessen efforts and actions to reduce overt hunger, and the important causes of poor growth and development? How much is this diverting funds, professional expertise, and NGO attention to
micronutrient deficiency control and away from important efforts to reduce the prevalence of poor growth and development?

Promoting better growth

Through almost all these years, in one form or another, growth monitoring (GM) of children has been practiced, and in some countries still constitutes the major intervention aimed to reduce malnutrition. It is often supported by UN and bilateral agencies, by NGO’s and by national governments (14). There are many other different actions that UN agencies, NGO’s and governments can, and do take to promote better growth of children. However for the last several decades many have concentrated on GM and the main assistance from agencies has been the provision of weighing scales, growth charts, and support for weighing and charting. Very often then, GM concentrates on weighing and charting, with very little attention to growth promotion, which should be the main objective. GM has a long history of enthusiastic advocacy, despite the fact that there is little research to prove its effectiveness as commonly practiced. Growth promotion using information from the mother, the community and local health workers has been relatively ignored. There have often been assumptions that the main problem is that the mother is lacking more in knowledge, and in desire and ability to care, rather than lacking in resources, support and time; and that she has good access to reasonable health care, when all too often this is not true. The existing health care system may be dysfunctional, and now because of structural adjustment there may be charges that she cannot afford, so access to health care for mothers and children is even more problematic.

This Colloquium on promoting growth and development of underfives provides an opportunity to examine critically this particular intervention because unlike some others, to which I have alluded; GM is focused on growth failure as the major nutritional problem.

Rightly or wrongly I attribute the beginning of the GM movement to the early work of David Morley in Nigeria leading to the innovative Ilesha growth chart (2). But undoubtedly for many years before that, paediatricians were weighing babies and following their weight gain, and giving advice based on that. But I expect that the way Morley used GM in Ilesha, and elsewhere, was very different from the rapid weighing and charting that has become the commonest form of GM practiced for the last three or more decades, and of which many of us have been critical. We emphasize that GM should be a preventive, promotive and pre-emptive strategy to assist
optimum growth and development and to prevent growth retardation, not mainly to cure it. It should concentrate on maintaining good growth, and not as is often the case be used mainly for rehabilitating children with growth failure.

In 1991 in a chapter on Growth Monitoring and Promotion (15) I wrote:

Growth monitoring, then, is a strategy to empower mothers to maintain good nutritional status in their children and to prevent growth retardation. Much of the action should consist of positive reinforcement rather than corrective action. As a diagnostic exercise it should be as much to find out what mothers are doing right as what is going wrong. Of course it is also to detect early growth faltering, to find the likely reasons for this, and to suggest to mothers corrective actions which are realistic and which they might try. It is likely to be relatively unsuccessful if used mainly to try to “correct” the growth of older children who are moderately or severely stunted, especially if these children are not wasted.

In all cases meaningful involvement of mothers should be the heart of a growth monitoring and promotion programme. It is a participatory exercise; it involves dialogue and discussion, not lecturing and scolding; and mothers should help in decision making, for example, about the location, the hours, and the organization of GM sessions. Mothers need also to be consulted about such matters as the need for privacy and confidentiality, whether it is appropriate in their culture to weigh children nude or clothed.

These views of growth monitoring and promotion present the concept of the author and others of what it should be, rather than what it usually is in practice in countries in Africa, Asia, and Latin America in 1988. This author continues to see growth monitoring in action, which ignores these principles. Too often growth monitoring is used mainly as a weighing exercise, advice is given only to mothers whose children are doing badly (this often consists of public scolding).

Subsequently we conducted a community intervention trial in 12 villages in Tamil Nadu, India to evaluate the benefits of growth monitoring (16). The villages were divided into six “growth monitoring package of intervention villages (GMP)” and six “non-growth monitoring package of intervention villages (NGM)”. In the GM villages the health workers used growth charts to assist in educating mothers, and in the non GM villages mothers received advice and education without the benefit of a growth chart. After
30 months of interventions similar improvements in growth were seen in GM and NGM children. There was no additional benefit from the growth monitoring.

Assessment of growth faltering

It is also important to consider what anthropometric measurements are best to judge the adequacy of growth. In the decades of the 1950's and 1960's nutritionists relied almost entirely on young children's weight for age, and classifications based on this, such as the Gomez classification were widely used to grade malnutrition using this parameter, modified only by Bangoa to take account of oedema. But 30 years ago we pointed out that using height, as well as weight and age, allows for a better classification system (17). Waterlow (18) in his seminal paper entitled "Classification and definition of protein-calorie malnutrition" gave us credit for this, stating:

"As Seoane and Latham pointed out, weight for height is an index of current nutritional status; height for age gives a picture of past nutritional history. Since these parameters measure different things, it is desirable that changes in them be distinguished by different words."

We suggested that with data on weight, height and age malnourished children could be divided into three groups and that height deficits provided a measure of the duration constituting chronic malnutrition, now termed stunted; second children with low weight for height, we first termed acute malnutrition, which Waterlow termed wasted; and third children who we classified as having acute-on-chronic malnutrition have come to be termed children who are both stunted and wasted.

Some 30 years later, despite widespread acceptance of these classifications we find that in most countries GM is practiced based only on weight for age just as it was done in the 1960's and 1970's. Why?

A very important consideration at this Colloquium surely should be to answer that question. For over 30 years many of us have been pointing out that interventions were much more likely to reverse malnutrition in wasted children because of the acuteness of the condition, than in stunted children because of the chronicity. But GM using only weight for age does not distinguish these two forms of malnutrition. It is recognized that interventions may prevent the stunting from becoming worse.
For the young child regularly attending an under-five clinic, or GM post, there is value in following increments in weight. But unless, possibly at broader intervals (perhaps every three months during the first year and every six months after one year of age) the child’s length or height for age is recorded, advice given and actions taken may be inappropriate. It is recognized that length and height are more difficult than weight, to measure accurately in a young child.

Newer evidence (19) shows that stunting often begins in the first three months of life (and of course prenatally), and deterioration often continues for about 18 months. So interventions need to begin prenataally, then concentrate on the early part of life, but continue for three or four years because faltering often occurs until that age. Wasting tends to begin usually after three months of age, but in most parts of the world becomes more prevalent, or severe, only up until about 18 months of age. Interventions, which are more curative, than preventive, may be appropriate for children with wasting.

An important question is whether growth promotion, without weighing and charting, should now be an important strategy. This needs to focus on mothers, families and young children in the community. Activities that can reduce low birth weight, need a high priority. Most interventions are unlikely to be successful unless there is some understanding of local cultures, community resources, and mothers' knowledge and attitudes. What are the child rearing and caring practices; and what are the dietary, socio-economic, behavioural, health, infant feeding and other factors likely to influence growth and development of the young child? How much action should be directed at the individual mother and child, and how much be aimed at the community?

IMCI (20) (the Integrated Management of Childhood Illness) initiated by WHO more recently is being widely promoted by WHO and UNICEF in developing countries. To me it seemed unfortunate that WHO adopted this term, which alludes to dealing with childhood illness, rather than child health and that it is directed at reducing morbidity and mortality rather than protecting health. Can it be reoriented to be more preventive rather than curative? IMCI includes weighing and charting, and apparently this is being done in the traditional way of recognizing and treating growth retardation, rather than concentrating on preventing this. Periodic assessment of length or height rather than only weight would help direct interventions in a better way.
Inequity -- the root cause of malnutrition

The indisputable fact is that in the last 30 years there has been a widening gap between rich and poor, nations and people (21). This growing inequity should be unacceptable and is the root cause of malnutrition. Without effective actions designed to improve equity, stated goals to reduce undernutrition are empty promises. The inequity is not simply a widening gap in incomes, but gaps in access to education; to reasonable health care; to food security; to information; to adequate water; to life in a reasonably sanitary environment; and more. And the inequity may in part be based on inequity related to gender and even to social background or caste (22).

Targets promulgated at international conferences, and approved by governments north and south cannot possibly be achieved without improving equity and addressing some of its external causes such as globalization; the world economic disorder; the increasing power of transnational corporations, including concentration into global oligopolies; the negative impact of structural adjustment and WTO rules; and the resulting weakening of national governments. Inequity is not just another word for poverty. Kerala, Sri Lanka and Cuba provide examples of places where in different ways a greater level of equity, despite prevalent poverty has been associated with lower rates of infant and young child mortality, less undernutrition, less illiteracy, better health, and reduced gender bias than in comparable neighbouring areas or countries with more inequity, but less poverty. In most of these parameters there are striking differences for example between Kerala and Maharashtra; Sri Lanka and India; and Cuba and much of Central America.

We also make a distinction between equity and equality. Attempts to improve equity seek to reduce gross inequalities. The late President Nyerere of Tanzania put it this way when he stated “No man needs to live in a palace, no man should live in a hovel” (21). Where are the statistics on the degrees of equity and inequity in different countries and where are goals and targets to reduce inequity?

So-called free trade and globalization have been offered as the answer to improving the economics of poor countries. But almost everywhere globalization has increased inequity, and has also reduced the ability of poor nations to achieve national or local food and nutrition security. It is important that nutrition scientists study these issues and work with other activists to reduce inequity, to oppose harmful aspects of globalization (while supporting
universalisation of human rights) and to reign in the power of TNCs. Activism in the past has achieved some successes, most notably in countering the unethical promotion of breastmilk substitutes (22).

The 1999 Human Development Report describes the WTO as: “the first multilateral organization with authority to enforce national governments' compliance with rules”. In Seattle a public outcry slowed WTO’s attempts to strengthen its own power, to the detriment of developing countries. If we as nutritionists and health workers genuinely wish to strive for major reductions in undernutrition and anaemia we need to be active in this new coalition seeking to tame globalization and greatly improve equity; to change the unfair economic order and reduce the power of TNC’s and to promote the universalisation of human rights including rights to adequate food, health and care.

HIV/AIDS and nutrition

In any discussion related to promoting growth and development of children under five as we enter the 21st century, there is a need to recognize that the world pandemic of HIV/AIDS will have an influence. Although the major focus now is on sub-Saharan Africa, there will be far more cases of HIV/AIDS in Asia, than in Africa before the end of this decade.

HIV/AIDS can influence child growth and development in many ways. First the relationship between malnutrition and AIDS is well recognized (25). In Uganda many years ago AIDS was known as ‘slim disease’ because those with the disease became wasted. The nutritional status of individuals is compromised by infection, and the progression of the disease may be influenced by poor nutrition. Actions to improve nutrition may increase duration of survival as well as the quality of life of AIDS sufferers.

But in terms of growth and development of the young child there are two different loci with which we need to be particularly concerned. These are:

1. HIV infection in the young child, usually resulting from mother-to-child transmission (MTCT); the impact of HIV, or fear of HIV, on breast feeding and other child feeding practices; and the impact of a mother sick with AIDS or who dies of AIDS on the growth of her young child. Because breast-feeding is so important in supporting good growth and in reducing infections, it is of great importance that it not be undermined. HIV can be transmitted from mother to child through breast-feeding. But two-thirds of women with HIV do not transmit the virus to their infants, and of those that do, by far the majority of infections are contracted in
utero or during childbirth, and not via breastmilk. For most underprivileged mothers in Africa even if HIV positive, the risks in terms of morbidity and mortality are greater through not breast-feeding, than through breast-feeding especially exclusive breast-feeding for six months. Yet because of exaggerated concerns regarding transmission through breastmilk, and an underestimate of the risks of not breast-feeding we see a massive spillover effect with much less support for breast-feeding than there was before. The vast majority of women in Africa do not know their HIV status, and the UN guidelines clearly state that breast-feeding should still be protected, supported and promoted.

(2) The impact of HIV/AIDS, in general, on family, local, national and even international factors which may influence nutritional status of young children in developing countries. HIV/AIDS is overburdening already deficient health services; families and communities are losing their most productive members, and their breadwinners; agriculture in some countries is negatively impacted by AIDS; there is a huge increase in young orphans; teachers, trained health workers and others vital to maintain basic services are dying and not being replaced; and so on.

So the efforts to reduce malnutrition in those countries where HIV is prevalent will be hampered, and this impact cannot be ignored.

Inappropriate use of development funds

We need to examine honestly, and to be very concerned about, what happens to funds allocated to development activities, be this to improve growth and development; to raise health levels; or more generally to reduce poverty. Would I be far of the mark if I suggested that often 80 percent of the money is spent in the donor country; on high salaries, expensive travel including luxury hotel accommodations; on conferences and workshops where participants are housed and fed unnecessarily well; on high priced foreign and local consultants; and so on? Often as little as 10 percent of the funds allocated actually reaches the beneficiaries. This seems often to be the case with projects controlled by UN and bilateral agencies; large NGO’s; international academic programmes; and other development groups. Criticism of the “development set”, in which almost all of us are involved, has been voiced for a long time, but little seems to have changed. This has surely contributed to the very limited success in reaching targeted goals to reduce
Conclusions

In my review of historical trends in nutrition policies and programmes, am I being negative and cynical, and is my message one of pessimism? I think not. I am actually hopeful, and optimistic about the future. We all know that there is enough food grown adequately to feed the whole world population now, and even with population increases this will remain so. I believe that most human beings are good, decent and caring. I believe we have available actions that if adopted, and implemented by communities, could greatly reduce poor growth and development of young children. This would be much more likely to happen if appropriate policies and actions were taken at the national and international levels.

In 1961 in the village of Maposeni (27) and in 2001 on the small Indian Ocean island of Chole – both in Tanzania, I have involved myself deeply in the field doing what would now be termed participatory action research attempting to help communities help themselves using rather broad approaches including health, agriculture, education, communication and social sciences to improve nutrition, by improving the quality of life of rural people. Some of the types of interventions discussed in this paper are included in actions to reduce malnutrition and improve health in Maposeni and Chole.

In terms of my concern for the international economic order and the widening inequity I take a rather activist, or participatory approach be it at the county level or at the international level. In rural Tompkins County in upstate New York there are opportunities to work in favour of better wages for working people; activities in areas of equity and peace; strong Jubilee 2000 efforts to reduce third world debt burden; participation in a local food co-operative, in Eco-village housing; in supporting a local currency and local businesses. At the international level through writings and at conferences or other fora activities include pleas for greater equity and social justice; continuing work to prevent the promotion of breastmilk substitutes; to ensure adherence to the WHO Code; and to prevent manufacturers of breastmilk substitutes from taking advantage of the AIDS pandemic to peddle their products.

I am optimistic that before very long there will be a major revolt against the current economic order. This is because super-capitalism has gone too far; TNC’s have become too powerful, and
too monopolistic; and WTO has developed rules that greatly weaken national governments. So although strongly in favour of democratic institutions and the market place we have seen a distortion of the free market system.

I hope that nutritionists can join in the building coalition with trade unionists, small farmers, oppressed indigenous peoples; women in societies where they lack certain rights, ecologists and environmentalists, human rights activists, and others. Such a coalition using democratic means could in the foreseeable future turn things around for the betterment of humankind.

References

HOW THE GROWTH AND DEVELOPMENT PROGRAMME WAS PUT IN PLACE IN FLANDERS AND WHAT WERE ITS DEVELOPMENTS OVER TIME

Nadine De Ronne

Life expectancy improved for children and adults in the 19th century. Infant mortality was still high at the beginning of the 20th century, due to bad hygiene in preparing bottle-feeding. Breastfeeding was seldom administered. Private initiative started up in several cities where physicians gave advice to young mothers promoting correct hygiene procedures in the care for children, promoting breast-feeding, and giving advice in preparing bottle feeding. These were the first baby well clinics.

These initiatives were centralized in the 'National Ligue for Child Protection' (1904) and financially supported by the National Health Department from 1908.

By those means other initiatives started: the number of infant welfare clinics increased, meals were prepared in large kitchens and offered to sick and weak children, and to pregnant and breastfeeding mothers, prenatal consultations tried to monitor pregnant women at risk, there was day and night care for children of working mothers, orphanages could be opened, and there were organizations fighting child abuse and neglect (f.i. the Brussels Société Protectrice des Enfants Martyrs).

The Nationaal Werk voor Kinderwelzijn (NWK) was established in 1919 as a public organization with the epidemiological aim of diminishing infant mortality by means of preventive advice. Besides the executive board and the administration staff there was a controlling medical committee supervising the items physicians had to deal with in the infant welfare clinics. Every child under age three could come to the consultations at the clinics. Nurses performed home visits to registered families to check if the advice was well understood and implemented. Families attending infant welfare clinics obtained material advantages on a regular basis: bottle feeding and vitamin supplements were distributed, baby linen was sold at low prices.

During the first decades of the 20th century food and hygiene were the most important issues to control for in infants, children, pregnant and breast-feeding mothers. Postnatal and infant mortality decreased, owing to a combination of the intensive work of

1 Kind en Gezin, Belgium
the NWK, better water supply provisions, sanitation of housing and social security.

Since 1930 medical knowledge progressed and the financial and social situation was improving. Preventive care changed: hygiene and food were no longer the most important issues. A vaccination programme against variola was implemented. Children from 3 to 6 years old could attend at separate sessions in the infant welfare clinics if not sufficiently followed by the school medical service. Because of the high postnatal mortality rate due to peri- and postnatal complications, prenatal monitoring clinics tried, by means of supplying preventive advice, to make pregnant women aware of the importance of good prenatal monitoring. There was a close co-operation with maternity hospitals in order to refer women if any problem was found. A social investigation in 1936 showed poverty was due to incompetence of young mothers to prepare meals, and to a failing basic hygiene. As a consequence cooking, sewing, housekeeping, and child welfare classes were given to all volunteers.

During World War II (1940-45) the nutritive conditions were bad because of an unbalanced feeding. There was a lack of fresh milk. Low fat milk was used. Because of the deficient growing parameters butter, sugar or cereals were added, which was dangerous because of its inappropriate composition for infant feeding and the lack of hygiene during manipulation. Fruits and vegetables were rare and expensive. Epidemic outbreaks of pertussis, diphtheria, measles, influenza, impetigo and scabies threatened children. Preventive support was very important for infants and for young children.

In the 60’s there was a reorientation in the activities to vaccination coverage, infection tracing, developmental follow-up, and family relationship. By that time paediatrics had become a full discipline.

As a consequence of the institutional reform of Belgium the role of the NWK was taken over by Kind en Gezin (Child and Family, 1/2/1987) in Flanders and by the Office de la Naissance et de l’Enfance (ONE) in the southern part. The activities of both organizations were enlarged but they are still related to preventive child support. In the meantime birth rate was sinking, there were fewer children per family and day care had become a primary concern because more parents were both working. Problems of the multicultural society, behavioural problems, child neglect and maltreatment, uncertainty of young parents gave the input to reorientation.

Kind en Gezin activities start from a concept of “good health” as the combination of normal growth, normal development, absence
of illnesses, social adaptation and emotional stability. The purpose is to promote infant welfare in Flanders. Advice concerning physical health, family relationships, psychological support and pedagogic advice enable us to make prevention a global concept. Longitudinal follow-up in the different disciplines can teach us something about the child in its environmental and social context.

Preventive family care anno 2001 is built on what was prepared last century. The aim of preventive childcare evolved from reducing infant mortality by means of implementing better hygienic conditions into the monitoring of every child in its entire development.

In the setting of the organization Kind en Gezin, preventive care service is possible for all families with young children up to the age of three. It starts during pregnancy with information sessions, prenatal consultations in co-operation with maternity clinics, maternity visits to explain the need for regular follow-up for every infant, and is continued by home visits by nurses, consultations by a physician and psycho-social-pedagogical advice by the nurses at the clinics, telephonic permanency by nurses every working day at district centres.

In the most deprived areas of Flanders particular initiatives have been set up. Special infant welfare clinics try to offer a wide range of made-to-measure services containing more than the basic package in both individual and group terms both before and after birth. Because of the multicultural population intercultural co-workers are employed who act as interpreters and bridge cultural differences. Day-care is needed more than ever because of changing working conditions (in shifts, at night) and because of the fact that in our region it is no longer a general rule that grandparents take care of their grandchildren. Professional day-care is provided by private or registered child minders, day nurseries and out-of-school care initiatives. Confidential Child Abuse Centres are located in every Flemish province and operate as points for reporting child abuse, provide initial assistance, and make a diagnosis so as to refer the children later on. These centres are responsible for co-ordinating and monitoring social work and for raising the awareness of the problem.

Preventive support includes screening programmes based on evidence based research: such as postnatal metabolic screening and the neonatal hearing-screening programme (AABR). A vaccination programme set up by the government is implemented everywhere in the clinics. Physicians working in the clinics are paediatricians or general practitioners with extra training in youth health problems.

Because of the multidisciplinary approach the staff consists of medical doctors, pedagogues, psychologists responsible for
updating on issues nurses and physicians are dealing with. Medical knowledge remains a very important issue in the follow-up of every infant, but it can be integrated with other disciplines. Medical staff is present at all levels in the organization: central administration, provincial committees, and for the quality coordination in preventive consultations and in day care.

All this together is the way we try to monitor every child in its growth and development in the broader sense of the word.

References

LET'S MOVE GROWTH MONITORING OUT OF LIMBO

David Morley¹, Mike Elmore-Meegan²

Early history of growth monitoring

In the late 50’s and early 60’s a longitudinal study of children growing up was undertaken in the village of Imesi-Ile in Nigeria. Parallel to this research the concept of a preventive and curative Under-5’s clinic was being developed (I). Central to both of these was the introduction and universal use of a simple large growth chart on which, at every monthly attendance, the weight for age of the child was recorded. Two innovations helped to make these charts more successful.

- **The child’s age was recorded using a calendar system.** The ‘clerks’ were weighing between 100-200 children every morning and calculating the age of each child would have caused inordinate delay. Instead the months starting with the child’s birth month were written in spaces at the bottom of the chart (Figure 1).

- **A home-based record.** The size of the population seeking good primary health care in a developing country makes any attempt at filing records financially impracticable. In practice, if mothers are encouraged to see the home based record as their passport to primary health care, losses were shown to be far less than for records filed in a clinic.

Worldwide spread in the 70’s

Growth monitoring, oral rehydration, breast feeding and immunization (‘GOBI’) were all involved in the early attempts to develop primary child health care world-wide with the encouragement of UNICEF, WHO, Governments and NGO’s. Considerable investment was made in weighing scales and training of staff. In many countries every child was provided with a growth chart and weighing of children became a universal symbol for primary child care depicted on stamps and in the media.

1 Institute of Child Health, University College, University of London.
2 ICROSS, Kenya
The 1980’s: A period of evaluation

The success of health care was evaluated in terms of cost input, and outcomes in terms of improved nutrition and decreased child mortality. Immunization and oral rehydration were shown to have a dramatic impact on the nutrition of children and their mortality rates. Growth monitoring, although successful in limited NGO situations, could not be shown to have an effect when spread nationally (2).

The 1990’s: Growth monitoring thrown into limbo

Examination of programmes and plans for improving nutrition of children in disadvantaged countries made by WHO, UNICEF, FAO and major NGO’s rarely now include any mention of growth monitoring (3). However, children are still weighed worldwide and some attempt is made to complete growth charts. The general experience is that these charts are not used for decision-making, and as a result are of limited value.

Discussions with those concerned with primary school education in developing countries will help us to understand why problems exist in completing weight charts and even more in their interpretation. Psychologists suggest that graphical representation
of number, such as a line graph is more easily learnt by children of primary school age. However, graphs are not taught in most primary schools in disadvantaged countries and are probably a subject beyond the ability of the teachers. Piaget (1896-1980) suggests that it is one of the more difficult concepts in learning. We need to appreciate that the understanding of graphs, if achieved, is only likely to take place during periods of higher education.

Experience in the past (4) showed that a proportion of postgraduate doctors attending a course in London had difficulty in completing a weight chart. If it can be accepted that primary school teachers are unable to teach the creation and meaning of line graphs, it is not surprising that health workers, even if they understand it themselves, can not pass this on to mothers. If we can accept that the creation and interpretation of line graphs is part of higher education, then it is not surprising that growth monitoring as practiced so far, has failed.

What should growth monitoring achieve?

Growth monitoring should achieve adequate growth and normal brain development. In many countries over half the children and adults are stunted in their growth. The vast majority of this stunting commences before birth and in the first year of life, although it is rarely recognized until later. Some of this stunting may have its origin in the insufficient milk supply from the undernourished mother. However, the major part is due or exacerbated by the low calorie density of weaning foods often associated with a low intake of micronutrients. The first year of life, when growth may falter, is also the period of rapid brain growth (Figure 2). Fortunately most of the infants are breast-fed and receive the essential nutrients for brain growth found almost exclusively in breastmilk. While the effect of poor body growth on the brain can be debated there is no doubt that undernourished infants with a poor calorie intake will reduce their physical activity at a time when this activity is needed for the child to participate in the stimulating environment now considered so important for success in formal education at a later age (5).

Growth monitoring should ensure adequate growth and is without question the only practical way of identifying faltering in growth within one or two months of its occurrence. If possible this should be immediately apparent to the mother and family who are those most capable of taking remedial action.
Figure 2: During the first two years of life, the human brain grows rapidly and cells intercommunicate.

A simple technology

In the successful eradication of smallpox, the introduction of a simple technology, the bifurcated needle, was considered to have played a major part. Similarly, it is hoped that a simple technology, a spring that stretches 1cm/kg, will give new life to growth monitoring. This spring mounted in the Direct Recording Scale stretches up the child’s growth chart; the kilogram lines on this chart are one centimetre apart.

The vast majority of children in developing countries are weighed in a busy clinic situation with a scale that uses a dial. The mother sees the needle of the dial moving, the health worker taking a reading and making the next entry on her child’s growth curve. Few mothers will understand this. The direct recording scale is
used away from a clinic and close to the home. In the presence of the family, the mother places her child into the trousers below the scale and immediately sees the spring stretching up her child’s growth chart. She herself, through a hole in the pointer at the top of the spring, introduces the next point on her child’s growth curve.

The major studies on the use of this scale have been undertaken by one of us (M. E-M.) in Kenya. The Maasai mothers come to understand child growth, why a child should be weighed, and identify from several charts the one chart showing normal growth (6). Further studies suggest that not only the mother but the grandmother, who in so many societies is the decision-maker, and the older daughters who are the future mothers, come to a similar level of understanding (7). The disadvantages and advantages of these two approaches to weighing infants are set out in the figure (Figure 3).

**Figure 3: A comparison of the dial scales with the Direct Recording Scales**
Locally made scales

The mention of weighing scales implies for most of us an expensive factory product. With the concept of the direct recording scales, all that is needed is a spring that stretches 1 cm per kilogram. These have an indefinite life and unless removed from the scale and over-stretched will remain accurate. There is no reason why these scales cannot be made locally from wood this will further reduce the cost. In general terms the costs including postage and packing, are likely to be: dial scales US $80, direct recording scale US $25, spring and plastic attachments US $12. Attempts in two areas are being made to create small income generating projects by making scales locally.

Summary

In all societies there is a move to take primary health care more into the community and involve community participation. Growth monitoring is still considered a major part of health care in many countries, but so far few have considered involving community members in undertaking growth monitoring. Nor is this likely to be successful if dial scales are used due to their expense and the complexity of creating and interpreting a growth chart. Evidence is available that if the mother is involved in weighing her child and plotting her child’s weight gain using a Direct Recording Scale, she and other family members comes to understand what she is doing. If faltering occurs research shows she may recognize it and take immediate action to improve her child’s intake of food.

References


**Direct Recording Scales and the Springs and further information available from Teaching Aids at Low Cost (TALC), PO Box 49, St Albans, AL1 5TK, UK. E-mail Talc@btinternet.com.**
**EVALUATING THE QUALITY OF GROWTH MONITORING AND PROMOTION PROGRAMMES IN CÔTE D’IVOIRE: MATERNAL SATISFACTION AND NORMATIVE ASSESSMENT**

Fèrîma Coulibaly¹, Hélène Delisle², Slim Haddad³

**Introduction**

Growth monitoring and promotion (GMP) is recognized as a key strategy for the prevention of child malnutrition by many, including UNICEF (1). However, the relevance of GMP is regularly challenged (2,3). Yet with appropriate training and supervision of personnel, and with community participation, positive impact was reported, for instance, in Tanzania (4), in India (5), and in Costa Rica (6). This suggests that GMP is likely effective provided it is well done.

In our study in Côte d’Ivoire, we assessed quality of four GMP programmes using two sets of methods: a normative approach, and evaluation through perceptions and satisfaction of mothers. The impact of programmes on children’s nutritional status was not assessed. Our basic assumption was that provided programmes met quality standards and mothers were satisfied, they would have an impact on children’s health and nutrition. The objectives were to identify the mothers’ criteria to judge the quality of GMP and compare these with our normative criteria, to assess the quality of programmes according to norms and to mothers’ satisfaction, and to suggest means of improving GMP programmes on the basis of observed strengths and weaknesses. We hypothesized that the quality of human relationships was the main criteria for mothers, and that assessing mothers’ satisfaction would give a good indication of overall programme quality since all dimensions of quality are interrelated. This paper presents the findings on mothers’ satisfaction and some results of the normative evaluation. More detailed findings on programme quality based on accepted criteria of good practice of GMP (5,7) are published elsewhere (8).

¹ MD, Department of Nutrition  
² PhD, Department of Nutrition  
³ MD, PhD Department of Health Administration, Université de Montréal, P.O. Box 6128, Downtown Station, Montreal H3C 3J7, Canada
Methods

**Study Design and Sites**

A qualitative approach was used, with a multiple case study design (9). Each of the four GMP programmes represented a case. Three of the 4 GMP programmes were located in poor districts of Abidjan, and the last one was in a near-by rural area. Two programmes (one urban and the only rural one) were in government health centres; the other two were run by NGO’s (one catholic mission and one civil organization).

**Conceptual Framework and Study Variables**

The same conceptual framework was applied to the normative and perceptual quality assessment (see Figure 1).

**Figure 1: Conceptual Framework**
Mothers’ evaluation criteria and satisfaction were examined in connection with the four dimensions used in the normative evaluation of the GMP programmes, namely organization, which encompasses physical structure and equipment, technical procedures, interpersonal relations, and knowledge and skills of personnel, which are partly reflected in technical procedures and interpersonal relations. These are seen as major determinants of GMP quality and of GMP benefits perceived by mothers. Mothers’ satisfaction criteria were identified on the basis of their expectations vis-à-vis GMP, and their criticisms.

Data Collection Methods

Focus groups and in-depth individual interviews with mothers were conducted to explore their quality criteria and their judgement on the GMP programmes. Individual satisfaction level was only assessed during individual interviews. Mothers attending GMP activities, as well as those not attending, were invited to take part in the study. The principal investigator spent six weeks in each of the four study sites. Four focus groups and eight individual interviews with mothers attending GMP, and two focus groups with non-attending mothers, were conducted in each site. Mothers of 0-36 month-old children were invited to join the study as they arrived for GMP. They had to give their informed consent, after being explained the purpose of the study. The first eight mothers were recruited for individual interviews. For focus groups, mothers were divided in two groups according to age (15-29 and 30-45 years) in order to allow for more open discussion. Mothers not attending GMP were recruited in the community with the help of attending ones. Individual home visits were again paid to all participants before the interviews to gain their trust and to insist on the confidential nature of the information they would provide. Language spoken was another grouping criterion, but there was no need to differentiate according to socio-economic status. All lived in rather poor areas and they had limited or no schooling. For the normative assessment, we observed several GMP sessions using a detailed checklist of good practice indicators. Each GMP officer was observed at least twice, on random days, for a total of 23 observations. Individual interviews (n=12) with personnel were conducted, using a semi-structured questionnaire to assess their knowledge, attitudes and practices.

Data Analysis

Interview transcripts were first analyzed to identify the main theme constructs discussed by the respondents (10), based on the
interview questions and on the conceptual framework of the study. Inter-analyst reliability was 65% first, and after concertation, it reached 88%. Intra-analyst reliability coefficient was 90%.

The themes and sub-themes referred to the following topics:

- Mothers’ criteria of GMP quality, and the expectations of those attending and not attending GMP;
- Mothers’ judgement on GMP programmes, including positive aspects and criticisms;
- Reasons for not attending GMP (in the case of non-attending mothers).

Themes and sub-themes were imported into NUD-IST 4.0 software for analysis.

The frequency of occurrence of different criteria, expectations or criticisms as expressed by mothers was calculated. In-group discussions, a given criterion (or expectation or criticism) was only counted once even if more than one woman mentioned it. Four levels of satisfaction were identified based on individual interviews with mothers: unsatisfied, little satisfied, satisfied and very much satisfied, with corresponding scores ranging from 1 to 4. Mean overall satisfaction level was calculated in each programme, and satisfaction with each dimension of GMP was correlated with other dimensions, and with overall satisfaction. For normative assessment, quantifiable data were analyzed with SPSS 9.0. Quality scores were calculated for every dimension of GMP, and their association analyzed using Spearman correlation. The internal consistency of scores was tested with Cronbach Alpha.

Results

GMP is an activity of the health sector, and it is carried out by health professionals (midwives, nurses, social workers) or community health workers. GMP is sometimes coupled with immunization and with group talks for health and nutrition education. In all the sites, curative care is available, generic drugs are sold at low price, and nutrition rehabilitation is provided for malnourished children.

Around 50 mothers were involved in group or individual interviews in each site. Women appeared more reluctant to talk in individual interviews than in focus groups, especially in the rural site. A few questions remained unanswered, particularly those pertaining to behaviour of GMP personnel. Non-attending mothers appeared very vocal in their criticisms of the programmes. Most of attending mothers had a child aged under one year.
Criteria used by mothers to assess quality of GMP programmes

General and specific expectations of mothers regarding GMP are considered to define their criteria of quality and satisfaction.

General expectations and expected benefits

Mothers value the importance of GMP. What they seek in the intervention is to be reassured on their child’s growth, and to learn how to feed and care for the child for optimal health. This is what motivates them to attend GMP.

Specific expectations

These refer to mothers’ perceptions of how GMP should be organized and executed.

Organization

Avoiding waste of maternal time was frequently mentioned. Mothers expressed the wish for GMP to be held more frequently in order for shorter waits for attending mothers. GMP should be offered not only in mornings, but also in afternoons, as mothers feel that they would then be more available to attend. They would like that all mothers that show up for GMP be accepted, and in order of their arrival. GMP should start on time. Two other criteria were frequently mentioned by non-attending mothers: a maximum fee and a walking distance.

Technical procedures

The need for individual advice or group education in order for mothers to better feed and care for their children is mentioned in nearly all interviews and discussions. They expect to be informed of the weight and health status of their child at each weighing. In the case of inadequate weight gain, they want the worker doing the GMP to look for the cause of the problem and to inform them on what they can do to solve the problem.

“If they weigh my child and find that his weight is good, they should let me know. If I weigh the child myself, I will not know what is OK and what is not. So they should tell me what I have to do so the child gains weight and is doing well.”

Mothers also expect that if the child is sick when coming to be weighed, he will receive proper treatment. They state that immunization status should be verified. Mothers would like to be complimented on their child if he is doing well. They want food demonstrations, and they also want to be asked how they feed their child in order for any mistake to be corrected. Some mothers
expressed the wish to learn from the feeding and care practices of mothers whose children are thriving. Some also insisted that the GMP practitioners should make sure that they understand and can put into practice the advice given to them.

**Interpersonal relationships**

Nearly all respondents emphasized the need to be well received, and to be respected. Mothers also wish to be able to speak to the GMP officer without fear, and in return, they want the officer to answer in a gentle manner, and to be willing to help.

“I want them to be our friends, so that we can talk freely with them. Child weighing has to be a way for the GMP officer to help mothers, and mothers also have to help one another”.

In the rural government programme and in the civil NGO one, mothers mentioned that they should be able to understand the language spoken by the GMP officer, and also that conflicts between mothers should be avoided.

Regarding GMP-related services, supplying essential drugs at low cost (done in all programmes), selling complementary feeds at low cost, and immunizations are highly valued by mothers, who recognize that the immunized child is protected against major killer diseases. “Add-ons” that mothers view as incentives to participate in GMP are some form of rewards for regular attendants with children who are doing well, as well as material assistance for the very poor.

In all focus groups with mothers attending GMP, involving community leaders was seen as important, as it would result in social mobilization for GMP, and mothers would more easily gain approval and support on the part of their family. The proper age range for GMP was up to 2 years in 66% of group discussions.

**Mothers' and experts’ GMP quality criteria**

Table I lists the criteria of GMP quality under three categories: those that mothers mentioned and that we used in our good practice-based evaluation of programmes; those that were identified only by mothers; and those that were only considered by us, and not by mothers. It is seen that maternal and “expert” criteria show a great deal of consistency. Those that are omitted by mothers are primarily technical in nature. Sharing of knowledge and best practices among mothers, and using their own language were only mentioned by mothers; these criteria were not included in our checklist, in spite of their relevance. As for complementary services or activities, others referred to material assistance, although immunization was also mentioned.
Table 1: Consistency between expert’s and mothers’ quality criteria

<table>
<thead>
<tr>
<th>Organization</th>
<th>Expert’s criteria identified by mothers</th>
<th>Expert’s criteria not mentioned by mothers</th>
<th>Mothers’ criteria not included in expert’s list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting time</td>
<td>Results transfer to higher levels</td>
<td>All mothers who show up for GPM are accepted</td>
<td></td>
</tr>
<tr>
<td>Attendance fees</td>
<td>Personnel (numbers and qualification)</td>
<td>GMP starts on time</td>
<td></td>
</tr>
<tr>
<td>Opening hours</td>
<td>Supply of growth charts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to GMP site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of sessions per week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of child weighing per month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precincts and scales cleanliness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of seats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organiza- tion</td>
<td>Check scale</td>
<td>Examine child doing well once in a while</td>
<td></td>
</tr>
<tr>
<td>Technical procedures</td>
<td>Copy children’s weight in the general registry of centre</td>
<td>Share knowledge and best practices among mothers</td>
<td></td>
</tr>
<tr>
<td>Do history of feeding practices</td>
<td>Draw the growth curve, interpret it and explain it to mother</td>
<td>Look for simpler and cheaper alternatives solutions</td>
<td></td>
</tr>
<tr>
<td>Encourage and congratulate mothers if child doing well</td>
<td>Closely follow-up children with growth faltering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give nutrition advice to mothers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remind immunization date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek causes/solutions in growth faltering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check mother’s understanding</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Make sure mother can follow advice</td>
<td></td>
<td></td>
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<tr>
<td>Motivate mother to come back</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Treat sick children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do food demonstrations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Related activities</td>
<td>Related activities</td>
<td>Related activities</td>
<td>Related activities</td>
</tr>
<tr>
<td>Immunizations</td>
<td>Family planning advices</td>
<td>Rewards for mothers whose children thrive</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material assistance of poor mothers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drugs and complementary food at low cost</td>
<td></td>
</tr>
<tr>
<td>Interpersonal relationships</td>
<td>Officer’s motivation and interest in GMP</td>
<td>Mothers want:</td>
<td></td>
</tr>
<tr>
<td>Mothers want to:</td>
<td>Contact time between officer and mother</td>
<td>To be able to speak to the GMP officer without fear</td>
<td></td>
</tr>
<tr>
<td>Be well received</td>
<td></td>
<td>To get help from GMP officers</td>
<td></td>
</tr>
<tr>
<td>Be respected</td>
<td></td>
<td>To understand the language spoken by the GMP officer</td>
<td></td>
</tr>
<tr>
<td>Have GMP officer’s personal attention</td>
<td></td>
<td>Avoidance of conflicts between mothers</td>
<td></td>
</tr>
</tbody>
</table>

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Mothers’ judgement on GMP vs. normative quality

Figure 2 gives the total number of positive and negative statements made by mothers on each programme. It is seen that government’s programmes are more criticized than the others.

However, all four programmes were similarly evaluated as regards organization, and similar shortcomings were identified by mothers, as well as through our evaluation. Opening hours are inadequate and fees are usually considered too high. Mothers complained about waiting time and being turned down in certain instances owing to overcrowding. Criticisms predominate on technical procedures only in the case of government programmes. Mothers complain about the lack of advice given to them, the absence of investigation of the causes of growth failure, and the fact that immunization status is not checked. We found the same through observation. In non-governmental programmes, there are few complaints. Nutritional advice is usually given in the course of group education, including the promotion of breast-feeding. Mothers value the advice, although it is not always scientifically sound (which they cannot judge) as mentioned in normative evaluation, nor practicable (which they forcibly recognize). For instance, recommending orange juice for two week-old infants is not justified. In the non-governmental programmes, mothers are asked
about the health of the child. However, it is only in the Mission that a systematic history of the child’s diet is taken and mothers informed of the weight of their child.

Mothers are generally unaware of the growth chart. Malnourished children screened in the GMP programme are referred to the hospital if severe infection is present, otherwise nutritional rehabilitation is done on a day-care basis over two or 3 weeks according to WHO protocol (11). Regarding human relationships, mothers, particularly younger ones, complain about poor reception, lack of consideration and of personalized attention, particularly in government programmes and in the civil NGO. In all four programmes, mothers complain about being sometimes turned down even before closing time, and about their time being wasted in long waits before being attended to. All criticisms and positive points mentioned by mothers on technical procedures and human relationships were included in the normative assessment. The scores for these two components of quality were correlated in our evaluation of programmes \( r=0.92 \) and \( p<0.01 \), but showed no relationship with GMP officers’ knowledge scores.

The results of the normative evaluation of programmes are shown in Figure 3, and maternal satisfaction scores in Figure 4. It is seen that the ranking of programmes is similar with both methods.

**Figure 3: Mean scores of technical procedures, interpersonal relationships and knowledge by programmes**
Figure 4: Maternal satisfaction with GMP programmes in general and with specific components (from individual interviews)

Satisfaction with government programmes appears lower. The Mission programme is the best rated. The civil NGO programme gets a lower mark than the Mission run programme. There is a close correlation among specific component satisfaction scores, and between these and overall satisfaction, as seen in Table 2. Satisfaction score with interpersonal relations is the most closely correlated with overall satisfaction (r=0.73)

Table 2: Correlation among scores of mothers’ satisfaction, overall and specific (Spearman r)

<table>
<thead>
<tr>
<th></th>
<th>Organization</th>
<th>Technical Procedures</th>
<th>Interpersonal relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall satisfaction</td>
<td>0.63*</td>
<td>0.59*</td>
<td>0.73*</td>
</tr>
<tr>
<td>Technical procedures</td>
<td></td>
<td></td>
<td>0.78*</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td></td>
<td>0.55*</td>
</tr>
</tbody>
</table>

*P<0.01

As can be expected, mothers report that they are more likely to attend GMP if they are satisfied with the programme. All non-
attending mothers had already attended GMP. Most often, they would stop going because they were not satisfied, meaning that their expectations were not fulfilled.

“They don’t tell you that your child is not growing, that you should give him this or that to eat. I don’t like that. If they told me, I would like it. But since they don’t, I don’t like the weighing and I feel I waste my time and my work by going there”.

Other reasons for not attending are interference with income generating activities of mothers, or with domestic chores normally done in mornings, or else, disapproval by a family member.

Discussion

Our in-depth study of four GMP programmes run by different institutions in Côte d’Ivoire was intended to assess maternal satisfaction, the underlying criteria, and to compare these with our own criteria for evaluating the quality of these programmes. Many of the criteria stated by mothers have been reported in previous studies on satisfaction with primary health care and reproductive health services (12,13). To our knowledge, our study is the first to use such an approach in the framework of evaluation of nutrition programmes (for GMP is considered a nutrition intervention programme, or better, a strategy for nutritional improvement).

It is interesting to note that mothers’ overall evaluation of programmes is very close to the conclusions of our normative assessment of the same programmes, which adds to the credibility of the findings (9), and confirms the ability of mothers to judge programme quality. Programmes indeed varied in quality, but government-run programmes rated lower than NGO-run programmes. Detection and follow-up of high-risk children was inadequate in all programmes, and particularly so in government ones. A common observation or complaint was poor organization. Mothers brought out most shortcomings regarding interpersonal relations, but only some of the technical weaknesses. There are indeed limitations to end-users’ evaluation, as noted by some authors (14). In our study, for instance, mothers were not in a position to fully evaluate technical procedures as they are not aware of specific requirements, and they cannot assess the scientific relevance of the advice given to them. Nonetheless, the remarkable consistency of mothers’ and expert’s criteria of GMP programme quality is indicative of content validity (9) of our study.
Mothers perhaps even more than GMP officers recognize the importance of prevention in GMP since they include many such items as criteria of their satisfaction. They wish to be given support, advice and information in order to better feed and care for their child, thereby preventing growth failure and disease. Identified shortcomings in technical procedures and interpersonal relations betray inadequacies of personnel in nutrition, in persuasive communication, and in caring; these shortcomings could be overcome by training focusing on skill development. The poorer quality of government programmes could be ascribed, at least partly, to shortage of material. Lack of personnel interest and motivation in the activities may also be involved, in addition to lack of supervision.

Mothers express a rather high level of overall satisfaction with the GMP programmes, in spite of numerous criticisms. It is a common observation that few beneficiaries would express general dissatisfaction with health programmes (15). In studies in Tanzania, the great majority of health care beneficiaries declared themselves satisfied, irrespective of the number of complaints or criticisms (12,16). The apparent discrepancy may be associated with methodological weaknesses, specific patients, characteristics, or else, the fear of reprisal. Fear may have been present in our study, and could explain the reluctance of mothers to express their own judgement on programmes, particularly in the rural area and during individual interviews. At least one respondent said that she feared that what she said would be repeated to the officers. Notwithstanding, the higher level of mothers’ satisfaction and a greater number of positive statements in the better quality GMP programmes provide external validity to our findings, which could therefore also apply to other similar population groups (9).

The strong positive correlation observed between technical procedures and interpersonal relationships in the normative assessment, as well as among mothers’ satisfaction scores on GMP suggest that these aspects are closely interrelated. Maternal satisfaction with interpersonal relationships was even more closely correlated with overall satisfaction, which confirms our hypothesis. Mothers are interested in GMP and recognize its importance, but they may stop attending if the programme is not in accordance with their expectations. Factors unrelated to quality of services were found to hinder GMP attendance, as also observed in other studies. In a study on GMP in Zaire (17), the end of immunization contacts with the health system, a child apparently in good health and maternal workload were common reasons for interrupting. In studies in Tanzania, lack of consideration or harshness of health workers were reported to discourage use of health services.
Community involvement in the GMP programme, assistance for the very poor, and rewards for regular attendance were among the incentives wanted by mothers. Interestingly, community mobilization was a key ingredient of success of the community-based GMP programme in Iringa, Tanzania (18). This strongly suggests that mothers’ wants and suggestions need to be taken seriously.

Conclusion

Our results show that mothers are capable of assessing the quality of services. Interestingly, mothers’ perception of GMP is congruent with the triple-A approach of UNICEF – Assessment, Analysis, and Action. However, programmes do not emphasize this preventive approach. More adequate training of personnel, and community involvement so that mothers’ expectations are better fulfilled, may bring about improvements in GMP programmes. Quality control is also needed for programmes to meet minimum standards as regards, for instance, the relevance of nutritional advice. For supervision, a checklist of criteria such as developed in our study could be used, after adding the relevant criteria supplied by mothers, particularly the sharing among mothers of positive experiences with child feeding practices. Unknowingly, these mothers advocate the positive deviance’ approach (19). Mothers’ satisfaction could be checked periodically in-group discussions so that programmes evolve in the right direction.

Acknowledgements

The authors wish to thank UNICEF Côte d’Ivoire for funding field data collection. They acknowledge support provided by Dr Jeanne Diarra-Nama, Director, National Institute of Public Health of Côte d’Ivoire. They are also most grateful to mothers and workers for their participation in the study.

References

PROMOTING GROWTH AND DEVELOPMENT
OF UNDER-FIVES
SEECALE – WORLD PROGRAMME IN MADAGASCAR

Michelle Ratsivalaka

Introduction

In Madagascar in 1992, nutrition action made a turn around from a limited number of isolated relatively ineffective nutrition interventions. Further the Malagasy Government requested the World Bank to support its poverty reduction objective by fighting malnutrition.

The Government and the World Bank reached agreement on a Food Security and Nutrition project (SECALINE 1) with a strong orientation on community involvement. SECALINE 1 was an independently managed project reporting to the Prime Minister's office, and made a contribution to the reduction of child malnutrition through the development of community based nutrition interventions in two of the most food insecure provinces of the country (Toliara and Antananarivo). Moderate malnutrition among children under five was reduced; however, the actions were too limited in their scope and coverage to impact on the nutrition situation of the country as a whole. Following SECALINE 1, SEECALINE 2 is based on lessons learned from SECALINE 1 and from local and international experience. The project aims at reducing child malnutrition nation wide and achieving sustainable nutrition outcomes by improving the quality and quantity of food intake by children and pregnant and lactating women.

The two projects, SECALINE 1 (1993-1998) and SEECALINE 2 (1998-2003) are funded by:

- World Bank (IDA): 49 million US Dollars
- World Food Programme(grant): 24 million US Dollars
- Malagasy Government: 3.1 million US$
- Japanese Government (ppf): 1.1 million US$
- Beneficiaries: 1.8 million US$

Country Profile

With a land surface of 587,040 square kilometers, Madagascar is the world’s fourth largest island. A narrow coastal
plain of 5,000 km, and a high plateau and mountains in the centre characterize the country, which is comparable in size to France, and the Netherlands combined. The climate is extremely diverse with tropical zones along the coast and in the north, temperate climate in the elevated areas upcountry, and arid areas in the South. The island is subject to natural disasters such as cyclones, droughts, and locust invasions in the South.

Administratively, Madagascar is divided into six provinces or “faritany”, districts and villages.

Madagascar has an estimated population of almost 16 million people. The population is growing at an estimated rate of 2.8 percent per year. More than half of the population is below 19 years of age and the total fertility rate is around 5.7 children per woman. About three-quarters of the total population live in rural areas (Table 1).

**Table 1: Basic social demographic and health related indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>15,0 million</td>
</tr>
<tr>
<td>Total fertility rate</td>
<td>6,0</td>
</tr>
<tr>
<td>Population growth rate</td>
<td>2.9 %</td>
</tr>
<tr>
<td>Proportion under 5 years</td>
<td>18 %</td>
</tr>
<tr>
<td>Proportion under 15 years</td>
<td>45 %</td>
</tr>
<tr>
<td>Proportion urban</td>
<td>28 %</td>
</tr>
<tr>
<td>GNP per capita (2000)</td>
<td>260 US$</td>
</tr>
<tr>
<td>GDP growth (2000)</td>
<td>4.8 %</td>
</tr>
<tr>
<td>Wood/charcoal of total energy consumption</td>
<td>80 %</td>
</tr>
<tr>
<td>Access to safe water</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>4 %</td>
</tr>
<tr>
<td>Urban</td>
<td>54 %</td>
</tr>
<tr>
<td>Literacy rate (population 15 +)</td>
<td>46 %</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>58 years</td>
</tr>
<tr>
<td>Women giving birth before age 20</td>
<td>57 %</td>
</tr>
<tr>
<td>Under 5 mortality rate</td>
<td>157/1,000</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>95/1,000</td>
</tr>
<tr>
<td>Stunting 0 – 36 months</td>
<td>48 %</td>
</tr>
<tr>
<td>Wasting 0 – 36 months</td>
<td>7 %</td>
</tr>
<tr>
<td>Underweight 0 – 36 months</td>
<td>40 %</td>
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</table>

**Nutritional Status**

Madagascar has one of the highest rates of chronic and severe malnutrition in Africa. At 48 percent, the proportion of stunted children below three years of age in Madagascar is the highest among the Sub-Saharan countries. Seven percent are wasted and 40 percent underweight. This implies that chronic malnutrition for
children under three is 21 times higher than the international standard.

In addition to the anthropometric indicators of malnutrition, national surveys also show that iron deficiency, leading to anaemia, is widespread among children. The prevalence of anaemia for women (15-49 years) is 42 percent, children under three 67 percent and school-age children (6-14 years) 38.5 percent. The prevalence of vitamin A deficiency is estimated at around 41.8%.

Finally, Iodine Deficiency Disorders (IDD) have been virtually eliminated since the launching of the National IDD control programme in 1992.

Poverty, lack of education, and poor feeding, health, and caring practices are the main causes of malnutrition in Madagascar. Malagasy’s actions to fight against malnutrition are:

⇒ Integrated Management of childhood illnesses (IMCI)
  • Vaccination;
  • Growth monitoring;
  • Vitamin A supplementation;
  • Iron-folate supplementation;
  • De-worming;
  • Salt iodination;
  • Prenatal and postnatal check-ups.

Nutrition action

**SECALINE 1**

The Food Security and Nutrition Project was the first in Madagascar of its scope and size to work with communities and NGO’s. The project focused on two provinces, suffering from extreme food scarcities, Antananarivo and Toliara. The components were:

• Income generating activities through a Social Development Fund and Food-for-Work;
• Direct nutrition activities;
• Institutional Strengthening through IEC and development of a National Food Security Strategy.

The Nutrition component included:

• Financial support for the national IDD control programme and iodized salt campaign;
• Community based nutrition with growth monitoring, nutrition education and supplementary feeding;
• Information, Education and Communication support and the elaboration of a National Food Security Strategy.
Results

One of the most remarkable results of this project, which closed in 1998, was the set-up of 535 community nutrition sites in two of the six regions where the growth of half a million children under five was monitored. There was a highly significant impact on children. In the targeted communities with nutrition sites, the rate of malnutrition among these children decreased by about 58% in Antananarivo and 48% in Toliara.

Thanks to the nation-wide iodized salt campaign, the goitre prevalence in pregnant women and school children decreased from 45% in 1992 to 15% in 1998.

The Social Development Fund paid for 2.8 million person-days of temporary work. The rural roads, bridges and other structures built mean that people now have better access to social services and markets. While the first Secaline project was highly successful only the iodized salt campaign had national impact. If anything, due to economic stagnation, hunger or malnutrition rates in Madagascar was worse in 1997 than in 1993. Expansion of the programme was sorely needed.

SEECLLINE 2

The second Community Nutrition project “SEECLLINE 2” covers the entire country, targeting almost a million children under three years of age, 2.5 million children up to 14 years, and more than 700,000 pregnant or lactating women. This coverage is reached by setting up 4,600 community nutrition sites in the most affected regions, where malnutrition rate is over 43% according to the anthropometric survey in 1998. In addition, SEECLLINE includes a nation-wide primary school nutrition component that includes de-worming (also for pre-schoolers), iron/folate supplements, promotion of hygiene among children and their teachers, in more than 6,500 primary schools.

Goals

- Reduce underweight and vitamin A deficiency in children under three by 30%;
- reduce iron deficiency anaemia among primary school children by 25%;
- Reduce helminthes infections (parasites) among 3 –14 years old by 25%;
- Improve community awareness and capacity to take action.
Methods

SEECALINE 2 is built on our prior experiences of the following interventions in SECALINE 1:

- Promotion of changing inadequate nutritional behaviour;
- Growth monitoring and promotion;
- On-site food supplementation of malnourished children and nutrition education;
- Support to the salt iodination campaign to reduce goitre;
- Focus on the community to improve nutrition and hygiene;
- Partnership between NGO’s and the regional sub-units to jointly select and invite communities to participate.

In SEECALINE 2 we expanded our efforts in the struggle against malnutrition by:

- Distribution of food supplements to take home,
- Food supplementation for all pregnant women in the last trimester,
- Vitamin A supplementation for children and mothers after delivery
- A school nutrition and health programme
- Implementation by several ministries of the aspects of the programme pertinent to their sectors. For example SEECALINE provides iron tablets to the Ministry of Education for primary school children, anti-helminthes to pre-schoolers as well as primary school children. SEECALINE supports the Ministry of Health by providing training in Integrated Management of Childhood Illnesses to medical personnel, and non-medical equipment to hospitals that have special units for severely malnourished children.

Whereas SECALINE 1 addressed children under five years of age, SEECALINE 2 is now targeting children under three, but also pregnant and lactating women, pre-schoolers (3 – 5 years) and primary school children. World Bank (1997) sees nutrition as a major determinant of human capital, and tailored actions by the community may correct growth faltering only if we intervene before the age of three years.

SEECALINE is halfway the second project. Until now, 1,947 community nutrition sites are operational in 49 districts of six provinces; 343,988 children under three participate in the growth-monitoring programme.

196,691 children from 6 months to three years old and 36,621 lactating mothers of new-born children have been supplemented with vitamin A, 176,760 malnourished children and
23,132 pregnant women were supplemented with Corn Soy Blend, a donation of the World Food Programme. 430,687 primary school children and 249,496 pre-schoolers are de-wormed and 424,385 primary school going children were supplemented with iron-folate.

The anthropometric studies showed a 15 percent decrease in the rate of malnutrition. It is too early to assess impact of the project, but monitoring and promoting growth is a central point to SEECALINE 2, as it is to many nutrition programmes around the world, as a tool to change inadequate habits in child health care and feeding in the fight against malnutrition.

In fact, the community perception still exists that inadequate food availability and production alone cause malnutrition and that increasing food production will solve the problem. Hence, agricultural development is generally seen as the only sustainable response to malnutrition, facing this problem, SEECALINE promotes behavioural change through the implementation of their IEC strategy as another sustainable solution in order to reach adequate infant feeding and breast feeding practices, and micronutrient supplementation. For SEECALINE, growth monitoring is an entry point to the sensitization to change inadequate habits. All children under three are weighed monthly by the NCA with the assistance of mothers. The NCA counsels the mother on the nutritional status of her child, as indicated by the growth chart, and advises her according to the child needs.

Through this activity, SEECALINE convinces mothers and the community to adopt its programme philosophy. Multiple IEC techniques and supports are used:

- Register, and reporting of individual data on a graph for the whole population;
- Home visits to children that show no progress in growth;
- Every trimester, NCA and the social worker discuss and sensitize the community the nutrition situation in the village, based on the evolution of the nutritional status of children, and the likely determinants of malnutrition in their community.

They help the community to identify solutions and design doable and sustainable activities and pass on other nutrition messages.

Even the very poor can improve their nutrition; the secret lies in proper breast-feeding weaning and knowing which local, low cost foods are nutritious. Thus interpersonal communication and counselling are vital.
SEECALINE’s mothers accept to bring their infant monthly to the community sites to weigh, because they are convinced that the child’s growth chart shows his health and they know what it means: a green child – yellow child – or red child on a growth chart. Promoting growth at SEECALINE’s community sites is very successful because over 70 percent of the targeted children under three are participating in growth monitoring. Moreover, weighing sessions are followed by group sessions of nutrition education and cooking demonstrations on top of the individual talks with the mother.

In Madagascar multiple partners in nutrition collaborate to harmonize messages, that can easily be understood by illiterate mothers. Which message is most effective in addressing essential behaviour? How do we get the messages across? SEECALINE’s key to these questions is to identify simple, do-able actions, which will make the biggest difference.

The messages cover infant growth monitoring and promotion, mother care, breast feeding, complementary feeding, micronutrients and food hygiene. All the messages have been validated and field-tested.

Some messages:

- Mothers, your child’s weight shows his growth and his health;
- Breast feed exclusively for six months, after six months, gradually add simple, nutritious foods;
- Families, wash your hands before eating to avoid transmitting germs, and thus prevent sickness.

Finally, many baby girls are now named SECALINE, this recognition can be attributed to the success of the programme.

Conclusive remarks

- Growth monitoring and promotion is not an activity that stand on its own
- It is a tool, an entry point to successful behavioural change communication
- It can and should be used to transmit health and nutrition messages to the entire community as well as to the individual parents
# Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GNP</td>
<td>Gross National Product</td>
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<tr>
<td>IDD</td>
<td>Iodine Deficiency Disorders</td>
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<tr>
<td>IEC</td>
<td>Information - Education - Communication</td>
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<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood illnesses</td>
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<td>MOA</td>
<td>Ministry of Agriculture</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>NCA</td>
<td>Nutrition Community Agent</td>
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<tr>
<td>NGO</td>
<td>Non Governmental Organism</td>
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<tr>
<td>PPF</td>
<td>Project preparation fund</td>
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<td>SECALINE I</td>
<td>Food Security and Nutrition</td>
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<td>SEECALINE II</td>
<td>School, Community, Surveillance and Education in Nutrition</td>
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<tr>
<td>WFP</td>
<td>World food programme</td>
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ASSISTING MOTHERS AND CARETAKERS TO ADOPT
BEHAVIOURS THAT PROMOTE CHILD GROWTH AND
DEVELOPMENT: THE HEARTH PROGRAMME IN
HAITI, VIETNAM AND ELSEWHERE

Gretchen Berggren¹, Monique Sternin², Jerry
Sternin², Warren Berggren³, Eddy Genece⁴,
Antoine Augustin⁵, Herve Bottex⁶

Introduction

Transferring Skills from the Successful (“Positive Deviant”) Caretaker
to the Family of the Malnourished Child

In most villages or poverty-stricken neighbourhoods in third
world countries there are some poor families whose children,
against all odds, remain relatively well nourished. Their mothers or
caretakers, known as “positive deviants”, hold the key to behaviours
that could be life-saving to other members of the community if
those skills could be transferred (1). The HEARTH method
accomplishes this transfer through a series of village level skill-
building workshops that take place in the “hearth” (kitchen) of a
motivated and trained volunteer mother from the same community
who uses local foods to begin the rehabilitation process for her
neighbour's malnourished children. The change in the child after
two weeks of receiving an extra meal and snack is, in many
children, so obvious that the whole community begins to take
notice. The menu, ferreted out through local participation in the
“positive deviant inquiry” (PDI) reflects the best of their own
traditions as well as sound dietary principles. In the fifteen
countries where the HEARTH/Positive Deviance method has been
applied, prerequisites usually include an ongoing community based
primary health care programme, growth monitoring/counselling
(GMC) capability, trained and supervised local nutrition trainers,

1 International Health Consultant (Dallas TX), Lecturer Harvard University School of
Public Health (retired)
2 Tufts University School of Nutrition, Medford, MA, USA
3 International Health Consultant (Dallas TX), formerly assist. Prof. of Tropical Public
Health, Harvard University School of Public Health
4 “Promoteurs Objectif ZERO AIDS (POZSIDA)”, Port au Prince, Haiti
5 CITYMED and MARCH projects; Ministry of Health and Population, Port au Prince,
Haiti
6 AIDS Family Services, Volunteers of America, Yonkers, NY, USA
and volunteer mothers as well as community preparation and commitment (2).

The Hearth/positive deviance method must be adapted to each culture where it is applied. Sternin and Choo (3), describing the method in Vietnam, write, “By examining the behaviour of the positive deviants in the community, we hoped to find local strategies for combating malnutrition. And that’s exactly what we did find. It turns out that the mothers in those families were going out every day to nearby rice paddies and collecting tiny shrimps and crabs, which they were adding, along with sweet potato greens, to their children’s meals. They were also feeding their children three to four times a day, rather than the customary twice a day. The shellfish and greens were both readily available and free for the taking, but conventional village wisdom held these foods to be inappropriate for young children. It was clear, therefore, that the immediate solution to the malnutrition problem did not require...money or outside resources; it simply required the community members to change their behaviour and to start emulating the positive deviants in their midst”.

Justification

To encourage child growth and development, programmes in the third world often develop community based strategies to reach every child with immunization, distribution of micro-nutrients, regular deworming, and growth monitoring/counselling (GMC), as well as early detection and referral for infectious disease. However, a sustainable and culturally appropriate nutrition intervention, is often lacking. Such an intervention should leave families with the capacity to intervene when a child begins to become malnourished, that is, when he or she falls behind in growth and/or is in danger of doing so. In order for the child to fully recover, “catch-up growth” is necessary; that is, the child needs to begin to grow again at a rate as fast or faster than the international standard median. The child may need to have an infection treated, but the mother or caretaker needs skills to overcome anorexia and to provide an appealing menu composed of inexpensive, calorie-dense local foods. A change in child-feeding behaviours is often needed. The HEARTH exercise in her own neighbourhood offers a mother or caretaker the chance to practice child-feeding and hygienic skills in a supportive atmosphere, surrounded by peers, under the direction of a trained volunteer mother. The alternative to simply “counsel” such mothers rarely results in behavioural change. Mothers may repeat a “message” and even understand it, but the question is whether they can apply it. Provision of a skill-building practicum that allows caretakers to participate in very low-cost food preparation and
feeding of malnourished children daily over a two to four week period is more apt to result in behavioural change.

The HEARTH model, if properly applied, allows enough time to develop new habits. At the same time, parental observation of the change in the child, if it can be attributed to improved feeding practices, is a powerful demonstration that “refeeding” the child really works. And because it involves training of volunteer mothers by locally recruited and trained nutrition-aids (a “training of trainers” approach) there is “fall-out” to the whole community. Fathers especially become excited by the idea that malnutrition can be prevented. It is expected that:

- A major output will be a cadre of volunteer mothers who can recognize malnutrition and begin the rehabilitation process in their own homes, using local foods, based on the PDI (above);
- Malnutrition will be prevented in the future by caretakers trained during the rehabilitative process;
- The whole community will be “turned on” to combat malnutrition (3).

Methodology:

How and why the HEARTH/Positive Deviance Method works

The goal of the HEARTH programme is to reduce or eliminate malnutrition in a sustainable way through a “skill transfer” of caring and child-feeding behaviours using a menu built on a local “positive deviance inquiry” (PDI) in the same village. Ideally, poverty alleviation is also associated with the programme, but in any case, the HEARTH approach allows mothers to practice and master skills that leave them better able to combat malnutrition. Related caring and enabling behaviours, such as good hygiene and child spacing methods are demonstrated or discussed during daily sessions for two weeks. The participating mother or caretaker is expected to contribute her share of the menu daily, to accompany her child, and to agree to continue the extra daily meal and snack for two weeks in her own home under the watchful eye of the volunteer.

HEARTHs are small, temporary village-level workshops for mothers or caretakers to practice nutrition and caring behaviours by beginning to rehabilitate their own children in the home-kitchen (HEARTH) of a neighbourhood volunteer, using local foods. The daily menu, based on a PDI previously accomplished by the villagers themselves, is practical and low cost. Since the HEARTH works neighbourhood by neighbourhood, there will be only 4 – 6 mothers and children in each HEARTH, and several will be going on
at once. One HEARTH supervisor-trainer will look in on each of
several HEARTHs in a given village daily for two weeks. Other
HEARTH trainer-supervisors will be working in villages nearby at
the same time, depending on how many HEARTH supervisor-
trainers the programme can employ.

Overall, the HEARTH supervisor-trainer, under the
supervision of her superior, will be supervising the rehabilitation of
20 – 30 children per month. More than this number of children
may be reached as mothers are permitted to bring younger siblings
to the HEARTH, and the volunteer mother herself may have a child
(malnourished or not) that will participate. (N.B.: One cannot expect
the volunteer mother to deny her own child the “extra meal and
snack” that the HEARTH offers!) The HEARTH supervisor-trainer,
previously trained by the staff of the programme, must be present
in the village while HEARTHs are going on, visiting each HEARTH to
trouble-shoot any problems, to be sure the menu is adequate, and
to complete forms for the information system. She will have
previously trained the volunteer mothers (five days training for a
few hours each day).

Steps to HEARTH Implementation

Preliminary preparation

The local staff must have one professional who devotes a good
part of his or her time to the project over one or more years. Several
young women, locally recruited and willing to live in and/or
work in outlying villages must be trained in communication skills,
simple nutrition, anthropology, principles of nutrition
rehabilitation, and use of the local food-value table to calculate at
least protein and calorie content of a given menu (involves weighing
food portions from the local market and calculating their food
value). They must carry out their own PDI after having weighed all
the children in a pilot village and visited their homes to find the true
“positive deviants”. They must carry out a PDI to the satisfaction of
their teachers, and understand the local child survival programme
components (such as immunization, family planning, and protocol
for de-worming). These young women, at least those proving
themselves capable, will become the supervisor-trainers for the
HEARTH programme. In Vietnam, such women were already part of
the infrastructure, and were willing to play this role. Ability to
communicate and have patience with mothers as they learn new
skills is important. A practicum in a nearby hospital for training in
breast-feeding and nutrition rehabilitation may be added.
Community preparation

The most crucial step for HEARTH implementation: Many visits to the community are required to assure that the whole village understands the problem of malnutrition and that something can be done. Community members, especially fathers, are invited to participate. The community is expected to furnish temporary housing for the supervisor trainer, and to support the volunteer mothers by helping with water and fuel, provision of temporary shade (a “tonnelle” in Haiti) and a nearby latrine.

Identification and recruitment of volunteer mothers distributed across the community. One volunteer mother for each 20-30 families, geographically distributed across the community is necessary. They may be illiterate, but must be willing later to devote a few hours each day for five days prior to HEARTH implementation in any given village, to learn to do a PDI and debrief with their supervisor-trainer, help create a menu based on the PDI, carry out a simple market survey to determine the lowest possible cost for a balanced menu, and demonstrate their capability to communicate with mothers and to cook a tasty meal using local foods.

Community participatory diagnosis of malnutrition

After having weighed all the children (usually under-threes) to detect those that are well nourished as well as those in need of rehabilitation, community members may help interpret their findings by construction a “pie diagram” to demonstrate the proportion of children, who are “normal”, the proportion severely malnourished (weighing who less than 3 std deviations below the international std median; or WAZ – 3), and the proportion moderately malnourished (weighing -2 to -3 std deviations below the international std median or WAZ -2 to -3). During a village “weigh-in”, the community health team identifies some under-threes, already weaned from the breast, who are members of poor families, and who are growing normally. Their families will be the focus of the PDI, carried out by local volunteers under supervision of the supervisor-trainer. The latter is a young woman with eighth grade education and a few weeks of extra training in nutrition. The “investigators” are volunteer mothers who will have training sessions in how to conduct the daily HEARTH exercise that includes good hygienic practices as well as preparation of the “positive deviant” foods and snacks.

Positive Deviant Inquiry

The PDI is accomplished through home visits to several (at least six) local poor families whose children (after complete weaning
from the breast) remain well nourished. It must precede every HEARTH in every village in order that volunteer mothers “discover” what skills they are expected to model (3). During the home visits to poor families a few local volunteer women and some staff members go together to the homes of several well nourished children to look for the key behaviours that are being applied in that home. This makes the HEARTH exercise culturally appropriate and means that there will be different findings in different cultures, and that HEARTH must be modified from place to place.

The PDI takes several hours and may require more than one visit. It includes a greatly simplified 24 hour diet recall for the well nourished pre-schooler that will pinpoint quality (what was fed) as well as the number of meals and snacks offered per day. Volunteer mothers can observe and memorize these findings and later debrief with their supervisor-trainer who records and synthesizes the results from a number of PDI’s; she helps the local interviewers to discover the consistent foods that are in use, at this season in this village. For example, in Than Hoa province of Vietnam, the finding was that families with well-nourished children consistently included shrimp, free for the taking from nearby canals, as well as sweet potato greens in their diets. Interviewers also look for the “three goods”:

- Good health seeking behaviours;
- Good caring behaviours;
- Good child feeding practices (3).

Hearth implementation (4,5)

HEARTHS rotate from neighbourhood to neighbourhood across a given geographic zone under the direction of trainer-supervisors (“monitrices”) who in turn are supervised by the professional manager-trainer, usually a doctor, a nurse, or a highly trained development worker. If one visits a village where HEARTHS are active, one sees that at a given convenient time of day, mothers or caretakers of malnourished children are making their way along with a child to a neighbour’s home to participate in preparation of an “extra meal” preceded by a snack and followed by group discussion of the menu for the day, and what will be expected on the morrow. Often the discussion includes related subjects such as child spacing.

Neighbourhoods are identified within a village, and all under-threes (or under-fives) are registered. The HEARTH nutrition-aid acts as a trainer-supervisor and must visit daily to encourage and help volunteer mothers in each neighbourhood, each of whom has been trained in the previous week. Mothers of malnourished children (participant mothers) have met together in preliminary
sessions in order to understand their contribution. They bring at least some of the foods to be used. The programme must provide some logistical support, including the training of each group of volunteer mothers before the HEARTH exercise begins (6,5).

After working with villagers to be sure they understand and want the programme, a trained supervisor-trainer (nutrition aid) will have trained volunteer mothers (not necessarily the “positive deviants”) who are willing to offer their homes for two weeks to begin the rehabilitation process for children in their own neighbourhoods. These volunteers carry out and learn from the “positive deviants” they visit to congratulate them and to observe their caring behaviours, including their good child-feeding practices (the PDI). There must be supervision by an overall professional manager-trainer, usually a professional nurse, doctor, or experienced development worker who is attached to the health or development project concerned. One such manager-trainer can train and supervise 12 –16 local nutrition aids (“monitrices”), each of whom must have at least an eighth grade education plus a few weeks training in health and nutrition. The overall professional manager should insist that training includes local market surveys as well as the PDI, and must understand and be able to calculate protein and calorie content of locally available foods, using the local food value table.

Are you ready for HEARTH? Preliminary requirements and preparation

The primary health care programme that undergirds HEARTH

The method requires that there be a primary health care programme and referral system, ideally, community based, that includes pre-school child immunization, community-based growth monitoring/counselling (GMC), micronutrient distribution, and deworming.

N.B.: A census-based approach followed by growth monitoring/counselling is ideal. Every child counts! Community volunteers can map and number houses and keep simple registers on mothers and children by address so that every child is reached and a record kept on pertinent data, such child’s monthly, bimonthly or quarterly weight. Door-to-door contact is essential to provide a “personal prompt”. Many private voluntary organizations (PVO’s) train resident home-visitors to invite mothers and children to “posts de rassemblement” where immunization, Vitamin A and iron supplement distribution, and periodic deworming are carried out as well as growth monitoring/counselling.
Trained staff and designated resources

At least one person professionally trained in nutrition must devote a portion of his/her time to nutrition training and programme management/supervision. Resources must be set aside to provide for identification, recruitment, and training or retraining of several local women or female community health workers as nutrition-aids (local trainer/supervisors) who can devote full time to supervision of HEARTS for a time-limited period (for example, three years to reach a population of 250,000). There must be provision for simple nutrition training; and training in how to identify, recruit and train local volunteer mothers (1:30 families).

Provision for a management information system (MIS) that will interdigitate with the local government health information system. Community health workers and/or HEARTH trainers (known as “monitrices” in Haiti) collect data necessary to calculate appropriate indicators: For each child one needs to know the nutritional status of the child at entry, at exit, and six months later in order to determine whether or not the child is recovering, that is, growing as fast or faster than the international standard median. Trainer-supervisors must have:

- Consecutive dates/weights (and occasional length measurements, if possible) on children being followed. A simple manual register of children with columns for each one’s date-of-birth, sex, address, and consecutive weights on given dates will suffice. The HEARTH trainer-supervisor keeps records on each HEARTH session. In addition to recording the results of the “positive deviant inquiry” (PDI), for each HEARTH participant the “trainer”, if not the volunteer mother, records: Name/address of child and of child’s caretaker; Date of birth, sex, date/weight (and height if possible) at entry, followed by date/weight at two weeks, four weeks, at six months and one year later.

- Consecutive weights/dates on younger siblings of malnourished children is also important in order to see if the mother has been able to prevent malnutrition.

Tools and plan for Community preparation and diagnosis

The project must have tools and instruments in place for participatory exercises that lead to a “community diagnosis” of malnutrition. Local weight/age growth charts or home-based growth monitoring records and weighing scales will be necessary. Parents help determine exact age in months for all under-threes and then weigh or re-weigh all the children, in a neighbourhood growth monitoring session. Someone in the community will be
trained to place one data-point on a collective weight/age graph for each child weighed, taking care not to embarrass any parent. Usually the national “road-to-health” growth monitoring card will have indicated some norms based on the international standard median, so that one can count the number of children that fall into the category of weighing less than two standard deviations below the international standard median. In addition, any child known to be losing weight or having growth faltering may have his or her data point circled to indicate danger of malnutrition. Adult caretakers participate in discussions to reach consensus on the importance of the problem.

Results

Results in Haiti

Historically, child mortality rates declined and admissions to the hospital for severe malnutrition declined during the period when village level rehabilitation/education centres (CERNs; see discussion section) were applied to a defined population in the Hopital Albert Schweitzer (HAS) district of the Artibonite Valley of Haiti (7). In other parts of Haiti, evaluators documented that mothers trained in CERNs had adopted better use of local foods and had better knowledge about how to combat malnutrition.

During the 1980’s, the “Division d’Hygiène Famila” of the Ministry of Health and Population of Haiti, under the late Dr Ary Bordes, recognized the need for nutrition intervention at the village level, but sought a low cost alternative to the CERN. With technical assistance from the Harvard School of Public Health, the “Projet Intégré de Santé et de Population” in the Grand Goave-Petit Goave-Trou Chou-chou region, re-established the use of nutrition rehabilitation centres, shortening the three month rehabilitation time to a two week demonstration of appropriate feeding behaviours and a two-week follow-up (8). This exercise was known as a village level apprenticeship in nutrition or “Ti Foyers” for rural mothers, and showed results equal to those of the CERNs. Children rehabilitated in the three-month-long CERNs were no better off, in a two year follow-up, than those who had benefited from the “Ti Foyers” (9).

From 1993-1997 the HEARTH method was applied by the Hopital Albert Schweitzer (HAS) to a population of over 200,000 during an embargo THAT ADVERSELY AFFECTED CHILD HEALTH (10). In a 1999 survey carried out by the Institut Haitien de L’Enfance on the same HAS population, infant and child mortality levels in the villages served by HAS or its outlying dispensaries were
at roughly half the national average. The accomplishment was attributed to good primary health care as well as an active nutrition intervention (the HEARTH model) \textsuperscript{(11)}.

Initial results of the HEARTH programme after a two-year application at HAS showed that, without a poverty-alleviation programme, about 60\% of mothers could be expected to prevent malnutrition after HEARTH training. Of the 40\% of children who fell back into malnutrition, half had chronic illness such as tuberculosis, and half came from extremely poor homes, in need of poverty alleviation \textsuperscript{(12)}. A retrospective study carried out by BASICS was flawed due to the high mobility of the population. Findings were confined to children who still resided in the area, and as many as 25\% had moved out after their HEARTH experience. In those remaining who could be studied, children mildly malnourished at the time of their HEARTH experience (usually younger siblings of the malnourished children) had profited most \textsuperscript{(2)}.

More recent results in Haiti have shown that about a third of mothers cannot respond to the HEARTH programme unless their children are first treated for chronic disease (often hidden tuberculosis), and/or unless they have access to a poverty lending programme.

Dubuisson, in the Save the Children impact area (Plateau Centrale near Maissade) Haiti, found from ongoing growth monitoring data that there had been a reduction from 3rd degree (severe) malnutrition form 26\% to 3\% over a three year period during HEARTH interventions \textsuperscript{(13)}.

\textit{Results in Vietnam}

Childhood malnutrition in Vietnam remains a serious and widespread problem. Despite recent downward trends, at the time of this programme application, 45\% of all children under age five years were more than two standard deviations below the reference median for weight-for-age. Reducing the prevalence of under-five malnutrition to less than 30\% by the year 2000 was a key goal in the 1995 National Plan of Action. The evaluation data reported here are for programmes that were in effect before recent secular trends were recorded. They did, however, compare data from where HEARTH had been applied to data from a similar ecological zone where it had not been applied.

Severe malnutrition has nearly disappeared and moderate malnutrition has been significantly lowered in villages where the HEARTH/Positive Deviance (or Poverty Alleviation/Nutrition Programme, as it is known there) was applied in Than Hoa province by a programme funded by Save the Children, USA (SC). Thanh
Hoa, a rural northern traditional Vietnamese Province with a population of 3 million, is located approximately 150 kilometres south of Hanoi. There, the method was combined with a poverty alleviation programme from the outset. Four main components were implemented in ten communes in Thanh Hoa Province, Vietnam from 1993-1995. These were:

- A community census;
- A growth monitoring and promotion programme for all children under three years of age;
- A positive deviance inquiry (PDI) to identify key growth promoting behaviours;
- A nutrition education and rehabilitation programme (NERP), that incorporated the results of the PDI, for children suffering from severe malnutrition (children whose weight/age was more than 3 standard deviations below the international standard median, express as <-3 WAZ).

A recent study was carried out in collaboration with the Ministry of Health in Vietnam and the Rollins School of Public Health of Emory University, in order to document the impact of the programme.

The evaluators write: “Evaluations of Save the Children’s (SC) Poverty Alleviation and Nutrition Programme (PANP) in rural communes of Vietnam have documented significant improvements in child nutritional status at the end the programme. A central element of PANP is the use of the Positive Deviance (PD) approach to identify key growth promoting behaviours. The objective of the study was to investigate whether improvements seen during a PANP intervention (1993-1995) were sustained three and four years after SC’s departure. Cross-sectional surveys were administered to 46 randomly selected households in four communes that had previously participated in PANP and 25 households in a neighbouring comparison community in 1998 and 1999. Two children per household, an older child who had participated in PANP and a younger sibling who had not, were measured (total n=142 children), and their mothers were interviewed.

Results: Older SC children tended to be better nourished than their counterparts. Their younger siblings were significantly better nourished than those in the comparison group, with adjusted mean weight-for-age Z-scores of -1.82 vs.-2.45 (p=0.007), weight-for-height Z-scores of -0.71 vs.-1.45 (p<0.001), and height-for-age Z-scores of -2.11 and -2.37 (Ns, p=0.4), respectively. SC mothers reporting feeding the younger siblings more than their counterparts did (2.9 versus 2.2 main meals per day [p<0.001] and 96.2% versus 52% offering snacks [p < 0.01]). All SC mothers reported washing
their hands “often” while only 76% of the comparison mothers did
[p<0.001].

Discussion: In sum, growth-promoting behaviours identified
through positive deviant studies and practiced through SC’s
neighbourhood-based rehabilitation sessions persisted 3-4 years
after programme completion. These sustained behaviours
contributed to better growth of younger siblings who were never
exposed to the programme itself” (14).

Results in Other Countries

Emerging data from more than 15 other countries where the
HEARTH method is applied look promising. Most are being
implemented by private voluntary organizations (PVOs) such as
CARE, World Vision/Canada, Africare, and Save the Children/USA.
The method is increasingly recognized as worthy of wider
application and of scaling up (15).
Sternin summarized incoming data from a number of countries with
the following findings from Save the children and other PVO’s in a
workshop in Bamako, Mali, in November 2000 as follows (3):

**Egypt**: (Save the Children, USA in Minya impact area): Reduction in malnutrition from 46% to 13% in first six months;
among control villages the rates of malnutrition had not changed
(16).

**Guinea**: (Africare Project) Weight gain at 2 months after
HEARTH entry showed that 57% of malnourished children exhibited
“catch up growth”, growing at a rate faster then the international
standard median growth rate (weight/age. Another 26% were
growing at normal rates. The remainder was being investigated for
chronic illnesses such as hidden tuberculosis.

**Bangladesh**: (Christian Service Society project in Khulna
region). Weight/age measurements on malnourished children two
months after entry into HEARTHS (“Shishukabars”) revealed 43 %
had “catch up growth” and another 47% had normal weight gain as
revealed on national home-based growth monitoring (weight/age)
graph.

**Mali**: Six months after Hearth intervention, 85% of children
showed continued improvement in nutritional status and 60% of
mothers had adopted appropriate weaning techniques.

**Nepal**: 73% of families whose children had participated the
HEARTH/Positive deviance approach continued steady
improvement of their nutritional status 18 months later.
Discussion

Historical Background

The HEARTH model is an outgrowth of Community-based Education and Rehabilitation Nutrition Centres (CERNS) of the 1960’s and 70’s, as they were applied in Latin America under PAHO leadership (National Institute of Nutrition of Colombia, 1971). These community-based centres educated mothers in their own communities to rehabilitate children using local foods. Usually they reached 30-40 mothers and children at a time, and children came daily for three months or more, with mothers taking turns in a practicum to prepare meals and learn new child feeding behaviours (17,18). They were extensively documented and shown to affect child feeding behaviours and improve nutritional status in Haiti, but not shown to be cost-effective elsewhere (19). The original model was an itinerant one, designed to have temporary centres in village after village. Once the CERNS tended to become permanent within a village, reaching further and further out to find malnourished children, they were less cost-effective, partly due to absenteeism and lack of participation from mothers who came from far away.

How adults learn

Adults learn best when they are given a chance to discover for themselves, and practice new skills in an atmosphere of safety and trust, where they are encouraged by their peers. There must be much iteration before a new behaviour is internalized. Behaviouralists in the advertising industry have discovered that it takes “21 repetitions of a skill in order to form a habit” (20). HEARTH offers, for a few hours each day for two weeks, a practicum in how and what to feed a malnourished child, followed by two weeks of follow-up. The person in charge of the practicum, a nearby volunteer mother, continues to look in on the mother or caretaker of the malnourished child for two more weeks as she practices in her own home. The demonstration that most affects villagers is the change in the child as he or she becomes hungry, playful, and active during recuperation. During group discussion and feedback sessions, the change can be attributed to food and not to medicine, as would happen in a hospital recuperation centre (21,22).
Pitfalls

**Personnel training, supervision and adherence to norms**

HEARTH programmes fail without adequate training and supervision. There is also a tendency to take short cuts, such as leaving out the participatory PDI.

Volunteer mothers are the key to HEARTH programmes, and they must in turn be trained and supervised by female workers (nutrition aids or supervisor-trainers known as “monitrices” in Haiti). These local women must have completed primary school, be highly motivated, and willing to learn and apply basic nutrition principles, as well as the techniques for the “positive deviant inquiry” (PDI). They supervise, and must in turn be regularly supervised. They must be committed to improving the quality and the implementation and evaluation methods for HEARTH. In Haiti and in Vietnam, supervisor-trainers are also trained in communication (how to teach mothers and transfer skills). They or their supervisors must be able to participate in local market surveys, and use local food value tables to calculate the vitamin, calorie and protein values of a given menu. They must have competency in recruiting and training local volunteer mothers to conduct the HEARTHs. They must master skills to carry out monitoring and evaluation requirements, and these will vary from country to country, but must be decided upon before the programme starts.

**The HEARTH menus**

The daily HEARTH menu, in the form of an "extra meal" and snack, ideally must offer at least 700-900 calories and 25 grams of protein as well as adequate micronutrients, especially Vitamin A and iron. The supervisor-trainer is responsible for this. Malnourished children require up to 150 cals/kilo/day, so the foods found in the PDI may need to be made more calorie-dense (23). In order to accomplish this, participant mothers must agree not to deny the child his or her portion of the family pot, once back at home (6,5).

**Community preparation and participation**

Well supervised multiple visits to communities to help them make their own “community diagnosis” of malnutrition are necessary. Community leaders can create pie diagrams in order to explain the proportion of children needing rehabilitation. They must be informed of the determinants and consequences of malnutrition. A “positive deviant inquiry” during home visits is a prerequisite to every HEARTH exercise. Community participants seek out “the three goods” (good behaviours) during home visits:
child feeding practices, health seeking behaviours and caring practices.

**Respecting the principles of participatory adult education and the PDI**

If the PDI is dropped, community participants see the menu as being imposed instead of realizing it came from their own successful mothers or caretakers. If mothers are "preached at" instead of counselled, if they are denied the privilege of participating in-group discussion the HEARTH programme will miss its mark. Regular supervision will help guard against this pitfall. Nutrition-aids may tend to find it boring and repetitive. They must be encouraged to continue to allow adults to discover for themselves (22).

**References**


General recommended references for the subject


Resources


7. Red Barna SC. Norway video on Nepal: this is a training video in Nepalese and English, lasting 37 minutes. It is based in the Hill country.
The following presentation will consider the Save the Children – US Positive Deviance Nutrition Programme in Taik Kyi Township, Yangon Province, Myanmar. It looks briefly at the process that was undertaken and then raises a number of issues identified during an evaluation visit made to the project in December 2000. The Nat Chung Village tract – part of the Taik Kyi township is made up of 14 villages under one chairman. Within the village tract there are a number of different ethnic groups represented and villages would appear to divide along ethnic lines. However within the groups of villages there is a degree of “community” felt – a factor necessary for the Positive Deviant approach to work.

The Project was set up as a “Pilot” during 2000 – beginning with a nutritional assessment that was undertaken during March 2000 in 14 villages where a malnutrition rate of 49% was found – using weight for age as the indicator of choice. Following presentation of the findings to members of the community and a commitment gained that the community wanted to be involved in addressing the issues of malnutrition within the village tract, volunteers from each of the 14 villages were identified. The volunteers then received training on the measuring of children, and also how to carry out the participatory situation analysis as well as the whole positive deviance process.

A participatory situation analysis then took place, the stated aims of which were to:

- Enable the Save the Children team and the villagers to get acquainted at the beginning of the project collaboration;
- Discover the current feeding, caring and health seeking behaviour in the community regarding children under three, in light of the baseline survey revealing a very high malnutrition rate of 49% in that age group (appendix A for various practices identified);
- Mobilize the villagers around child care and health issues in their communities and elicit their commitment to combat malnutrition in young children.

More than 60 mothers of children under 3 participated in the process through a number of focus group discussions and individual conversations and a number of home visits were also carried out. Other members of the community – traditional birth...
attendants, village elders, fathers and older siblings were also involved in some of the activities that took place.

Out of this process a Child Health and Development Group was formed with responsibilities for growth monitoring, immunization mobilization, births and deaths recording and also to be involved in general health campaigns within the villages.

The Positive Deviant Inquiry (PDI) was then undertaken by the villages elders and the volunteers: All children under three were measured and then the children divided up into those that were well nourished – ‘green’ the moderately malnourished – ‘yellow’ and the malnourished ‘red’. A coloured stick was taken and broken up to show the proportions of healthy and malnourished children. The question then asked was “are there children that are ‘green’ that come from poor families? The suggestion was then made that it is from these families that the community should learn what they have to do to have a well-nourished child. The emphasis of this part of the process is very much the “discovery” that poor families can have well-nourished children.

Families were then divided with those that had children < 3 years of age that were normal – “well nourished” then being wealth ranked. Those poor families were then measured against the following criteria:

- Child must not be an only child;
- Child cannot be less than 6 months;
- Child must belong to a family with a minimum of three children;
- Child should be a girl – preferably because the baseline survey revealed that more girls were malnourished than boys.

Families are then visited and through a process of interviews and observations the “positive deviant“ activities are identified. (See appendix B for full list of activities identified)

The next stage of the project can be seen to be divided into monthly cycles with Nutrition education sessions (NERS) held for 10 consecutive days at the beginning of each month – lasting between 2 and 3 hours each day. Mothers of the malnourished children identified are expected to attend for the session each day, bring food to cook, take turns at cooking the food and also participate in nutrition education sessions. The sessions take place in the home of one of the mothers or occasionally in the home of the volunteer.

Nutrition teaching takes place each day and covers the following five topics:

- Food and body hygiene
- Breast-feeding
- Prevention and treatment of illnesses
• Child care and development
• The balanced diet

Each topic is taught twice during the 10-day cycle to allow for reinforcement of the message and to be sure that mothers who miss a session don’t miss out on one part of the curriculum. The volunteers use ready-made visual aids and are trained in the messages that they need to explain to the mothers. Mothers are encouraged to discuss and ask questions, although volunteers vary as to how ‘interactive’ the sessions are.

Children are weighed on the 1st and the 10th day and their weight recorded on their growth charts. Those that gain sufficient weight and reach the “green” level on the growth chart, “graduate” from the programme. Foods used in the NERS sessions are identified through the PDI and mothers are expected to bring a contribution that increases so that by the end of the 10 days they are asked to bring almost all the foods except the oil and the peanuts. These ingredients are provided by Save the Children US through the project funding.

The full food ration given each day to the children in the NERS sessions is as follows:
• Rice 50g
• Oil 10g
• Peanuts 15g
• Egg 65g
• Fish/shrimp 31g
• Green Leafy Vegetables 80g

Which provides a total of 548.75 Kilocalories and 24.6g protein.

Using a food chart with the foods divided into 3 groups – the “GO”, “GROW” and the “GLOW” foods as promoted by the Myanmar “National Nutrition Centre”, mothers are taught how to make up a balanced diet for their children. By bringing a contribution, mothers get into the “habit” of providing these foods for their children. They also learn that some of the local beliefs about these foods (e.g. Fish gives children worms, vegetables give children diarrhoea) are untrue and that their children can gain weight on the diet.

For the remaining 20 days of the month the mother is encouraged to feed her child the same foods at home. The child is reweighed at the beginning of the next month to see what progress has been made with the expectation that the child will have continued to gain weight as it has continued to be fed the additional food at home.

Growth monitoring of all children under 3 takes place in the villages every second month to identify new children to be included
in the programme and also to continue to monitor children once they have “graduated” from the NERS sessions.

The positive deviance approach:

Advantages

Community Based
By involving the community at all stages of the process, the community themselves will have the opportunity to work out why their children are becoming malnourished and also can see that not all poor children are malnourished - as is often thought to be the case. The community can themselves identify what works for some families and learn to replicate these activities within their own homes. Therefore solutions are “home grown” rather than suggested by outsiders. The community can also provide support to mothers and their families, as they are involved in the NERS sessions.

Positive Emphasis
Looking at what works rather than what doesn’t, by taking a more positive approach. This is unusual. Many programmes concentrate on knowledge gaps and what mothers are doing wrong rather than putting the emphasis on what is working.

Mothers’ contribution
Mothers learn by doing – and obviously take pride when their children “graduate” into the green category on the chart.

Use of volunteers from the community
The programme uses highly motivated volunteers, mostly women to implement the programme and this is very positive as each are a member of the community and so are an integral part of the process. They know the families well and the needs of each family and can easily work to support the families over the lifetime of the project.

Issues with the approach
Within the Myanmar example there are a number of issues that can be identified with the approach and also the outworking of it in this project.
The small number of positive deviant families identified

There is a clear criteria for positive deviant families. In this case only 4 children from the 150 were found to fit the criteria and in reality none of these strictly fit – as 3 were male children and the 4th came from a family of only 2 children. The criteria themselves may constitute positive activities – i.e. small families may have less malnourished children, culturally boys may be fed before girls and therefore receive the better food. This was not considered within the process.

Cross checking of activities

By looking at what families with healthy children are doing but not cross checking, there is a risk that these same practices are being used by families with malnourished children and therefore these may not be the actual practices that are making the difference. There is a tendency to take any “good practice” seen or mentioned in the homes of the identified positive deviant families and take these as positive deviant activities. In this case activities mentioned in only one home were taken as positive deviant activities. Many of these practices were probably also being practiced in homes where children were getting malnourished.

What to do if there are no positive deviant activities

If there are no obvious activities what happens then. In the Myanmar case it seems that general good practice was promoted while any good activity that was identified by one family was used. While the community approach added some benefit it is difficult to say what the added benefit was of the positive deviant approach when the activities promoted could not be clearly seen to be making a difference within that community.

Sustainability

Behaviour change is very difficult to achieve and the Positive Deviance approach does not necessarily address the reasons why mothers feed their children on certain foods and why they use certain care practices. When talking to mothers in the NERS sessions it was clear that while they would bring the foods to the sessions and that they understood that these foods were good for their children, they stated that they would not be able to continue for the remainder of the month due to the costs involved. Therefore while the education had taught them what they could do – their economic conditions dictated that they would not be able to change behaviour. This finding is borne out in the reweighing statistics
within the project, which found that of those discharged having attended one set of 10 NERS sessions, 53.3% lost weight and needed to be readmitted. This figure did decrease to 25.9% for mothers that had attended 3 months of sessions but this still means that 24.1% of mothers are unable or unwilling to change their behaviour after continual inputs for a 3-month period.

**Caregivers**

One of the key concerns in the Myanmar situation is that of the main caregiver. As in many South East Asian villages – mothers have an important role to play within the agricultural production process and this means that the main caregiver is often a grandmother, or more likely an older sibling. In one NERS session, there were 5 young boys – aged between 6 and 9 who brought their younger siblings to the session. This means that the nutrition education is not reaching its intended target and also that the mothers are not learning to prepare the new foods. One of the main causes of malnutrition in these young children is because they are not fed often enough, an issue identified during the PLA process. Mothers leave the house at six in the morning and don’t return until it gets dark. Older siblings are in charge to the younger children and only feed when they themselves are hungry. Re-weighing sessions also take place during the day and so in many cases the mothers cannot be involved as they have other responsibilities. Therefore the opportunity for individual education and encouragement is lost.

**Wet versus dry feeding**

There is no doubt that providing cooked food allows the volunteers to watch the mother/caregiver feeding her child and also allows the mother to practice cooking the different foods – some that she may have never cooked before. However due to time constraints – some of the children are expected to eat a large meal in a short time – which they cannot do. Also as has already been mentioned many mothers cannot attend the sessions, as they simply do not have time to be there for 2-3 hours a day for 10 days. They may attend for one session and then send another family member with the child. There is no food provided for the carer and so often older children – that are hungry themselves are expected to persevere and feed a younger sibling while receiving nothing themselves. Often an older sibling will therefore share some of the food and so the child will receive less than is intended.
Supplementation or substitution?

With food in short supply it is likely that a child receiving a meal at the NERS will not receive another meal – i.e. the meal will replace one that would normally be given by the family and so there is a substitution rather than a supplementation effect. While the meal given is likely to be of a higher nutritive value and so there is some advantage to the child, the amount given is still low, around 500 kilocalories and so there is a potential devaluing of the additional food.

Ration Scale used

The programme only provides 500 kilocalories/child/day – which is considered low when programming for supplementary feeding. Emphasis is on the variety of foods involved but there is also a requirement to have all foods every day. Therefore the message is given that there needs to be a mix of foods each day – rather than providing fish one day and peanuts another day – which is a much more realistic diet for these families.

Provision of food by SC US

SC US provide the two foods that contain the highest number of kilocalories and therefore will make a considerable contribution to the weight gain of the children while attending the NERS sessions. These are foods that mothers may have difficulty being able to afford themselves and therefore there is a dependency on the organization for the energy dense foods. This may distort the weight gains achieved during the NERS sessions and also question the sustainability of the project. With a dependency on outside food the community is not actually feeding its own children back to health and it means that should the input from the external agency end then the project is unlikely to continue.

Cost of food

This issue is linked to sustainability as it was found that mothers – accepting that they could give different foods to their children and that these foods were good, admitted that they would not because they could not afford to do so. Therefore it can be seen that unless the programme actually addresses some of the underlying poverty issues as well it is unlikely that the impact will be maximized.
**Time for volunteers**

The programme depends on its volunteers to work very hard to mobilize the mothers. Volunteers are expected to visit families during the 20 days that the NERS sessions are not happening, encourage mothers to bring foods and fuel to the sessions and also to carry out the growth monitoring on a regular basis. It is clear from the villages visited that the volunteers that put in the hours do get better results. Many of the volunteers are busy mothers themselves and therefore care needs to be taken to not overload them with demands.

**Using weight/age**

While weight/age is an indicator of chronic poverty and therefore should be the correct measure to use – along with height for age, both have problems, as age is often very difficult to determine. Many children have no record of age and small errors in the age can make the difference between a child being included and not being included within the project. Therefore there may be a need for some more general interventions so that families don’t miss out from the education being provided.

**Conclusions**

The original Positive Deviant Project was set up in Vietnam and achieved a recognizable impact on nutritional status as clear positive deviant activities were identified that were replicable by all mothers with minimal additional cost or time.

However in the Myanmar experience, where no clear PD activities were defined the programme was devised promoting general best practice. Activities that were known to be “good” were promoted if mentioned by one family. Foods were also used within the NERS sessions that were not mentioned within the positive deviant inquiry but were chosen by the team as available at low cost within the village setting. However while available there was a cost involved and this was sufficient to put them out of reach to most mothers on a regular basis. This had the effect of promoting a feeding practice that was desirable nutritionally but not achievable.

The model strongly promotes the role of the mother as the caregiver and the person whose behaviour is expected to change. It was unclear how to deal with the situation where the daily care for the young children is by older siblings. Nutrition education was not tailored to this age group – while the rigid structure of daily NERS sessions precluded many mothers from attending. The growth
monitoring activity also takes place during the day, when the team is able to visit and so mothers are unlikely to be able to regularly attend this part of the process either.

While recognizing the positive benefits of the approach there is a need for more flexibility to be built into the implementation process. Growth monitoring sessions, with education could perhaps take place in the evenings to enable mothers and other members of the community to attend. Support to young caregivers is also important as they clearly have a role to play in the care of young children but must not themselves lose out by being involved in the NERS sessions. Steps should also be taken to work with the communities to address some of the other root causes of the malnutrition — economic and social rather than only focusing on behaviour.

**APPENDIX A: Summary of current feeding, caring, health seeking behaviour regarding children under 3**

<table>
<thead>
<tr>
<th>Feeding Behaviours</th>
<th>Caring Practices</th>
<th>Health Seeking Habits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding rice to babies under 4 months old</td>
<td>Child not supervised at meals</td>
<td>Food Hygiene</td>
</tr>
<tr>
<td>Young children not fed regularly</td>
<td>Child with poor appetite not coaxed to eat</td>
<td>Uncooked food placed on dirty surfaces</td>
</tr>
<tr>
<td>Not enough food per meal</td>
<td>Older sibling not trained to look after younger children</td>
<td>Cooked food not covered at all times</td>
</tr>
<tr>
<td>No variety of food except oil and salt</td>
<td>Child left to play by himself</td>
<td>Hands not washed with soap before handling food</td>
</tr>
<tr>
<td>Feeding non-nutritious snacks like puffed stick like cakes</td>
<td>Young caregivers do not want to play with toddlers or babies</td>
<td>Leftover food not heated before eating</td>
</tr>
<tr>
<td>Infrequent feeding</td>
<td>Fathers not involved in child caring</td>
<td>Body Hygiene</td>
</tr>
<tr>
<td>Rice water discarded</td>
<td>Food Hygiene</td>
<td></td>
</tr>
</tbody>
</table>

Feeding Behaviours:
- Feeding rice to babies under 4 months old
- Young children not fed regularly
- Not enough food per meal
- No variety of food except oil and salt
- Feeding non-nutritious snacks like puffed stick like cakes
- Infrequent feeding
- Rice water discarded

Caring Practices:
- Child not supervised at meals
- Child with poor appetite not coaxed to eat
- Older sibling not trained to look after younger children
- Child left to play by himself
- Young caregivers do not want to play with toddlers or babies
- Fathers not involved in child caring

Health Seeking Habits:
- Food Hygiene
  - Vegetables not washed thoroughly
  - Uncooked food placed on dirty surfaces
  - Cooked food not covered at all times
  - Hands not washed with soap before handling food
  - Leftover food not heated before eating
- Body Hygiene
  - Hands not washed with soap before eating
  - Children's hands and face not washed with soap before and after feeding
  - Hands not washed after going to the latrine
- Environment Hygiene
  - Fingernails not cut regularly
  - Floors not swept properly
  - Tables for meals not washed
  - Pigs, ducks, chickens and hens not kept in sites or coops
  - Pots and pans not washed with soap after use
  - Preventative and Curative Practices
    - Iodized salt not used
    - Late treatment of sick children
    - Do not know how to use ORS salt
    - Immunizations shunned because of fever
APPENDIX B: Selected Behaviours for Nutrition/ECCD Project
8/00

Feeding Behaviours
- Complementary feeding by 6 months
- Feeding the young child 4-6 times a day: 3 meals + snacks
- Feeding the young child a good amount of food per meal
- Feeding the young child a variety of food such as eggs, fish, beans and vegetables
- Cooking food with enough oil
- Feeding the young child nutritious snacks

Caring Practices
- Caregivers practice active feeding and supervise child at meals
- Caregivers play and sing with child
- Older sibling is trained to look after the younger child
- Caregivers encourage child with poor appetite

Health Seeking Habits

Food hygiene
- Washing vegetables at least 3 times
- Keep uncooked food in safe place
- Cover food at all times
- Wash hands with soap before handling food
- Heat up left over food before eating

Body hygiene
- Wash hands with soap before and after feeding child
- Wash child’s hands and face before and after feeding
- After going to latrine wash hands with soap
- Check children’s nails regularly and cut nails if necessary

Environmental hygiene
- Sweep floor before and after eating
- Clean bowls, spoons, pots and pans with soap and ashes after use

Preventative Practices
- Use of iodized salt
- Identification of danger signs (Looks unwell, refuse to play, not eating or drinking, lethargic, experiences changes in consciousness, vomits frequently, has high fever, has fast and difficult breathing)
- Home treatment of the sick child
- Home made ORS
- Immunization.
References


PREVENTIVE CHILD SUPPORT IN BELGIUM

Nadine De Ronne

At the beginning of the 20th century, bad hygiene mainly in preparing bottle feeding and prematurity were the main causes of high infant mortality which was in discrepancy with a better life expectancy for children and adults.

Private initiatives started all over Belgium giving free preventive advice to the young mothers in the infant welfare clinics in order to prevent this dramatic phenomenon. These private initiatives were controlled by one authority, the ‘Nationaal Werk voor Kinderwelzijn (NWK)’or ‘National Action for Child Welfare’ founded in 1919. This organization fulfilled a unique role concerning infant welfare in Belgium since 1920, and significantly contributed to a substantial decrease of infant mortality.

In order to reduce perinatal mortality due to prematurity and maternal morbidity, prenatal monitoring clinics were started in 1930. They tried to make pregnant women aware of the importance of good prenatal monitoring by supplying information, in cooperation with maternity hospitals.

Developments in medical science were not in line with actual needs at that time. When the social situation was improving, the issues doctors were dealing with had to change. The urge for advice involving only hygiene and food preparation decreased. Vaccination, child development and social issues became part of routine preventive care.

As access to medical care became universal (1945) and the number of physicians increased, the role of therapeutic and preventive child health care had to be redefined. Prevention became available not only in the public preventive setting but also in the ‘private’ setting: anticipatory guidance, screening for infections and metabolic diseases, and implementation of a comprehensive vaccination programme. The difference between the two settings is that parents have to pay for private consultations (co payment); welfare clinics are entirely free of charge.

When NWK stopped its activities in 1986 and its role was taken over by Kind en Gezin (K&G) in Flanders and the Office de la Naissance et de l’Enfance (ONE) in Wallonië, the vision of ‘health’ had changed even more from basic hygienic advice to a combination of growth, development, psychological support and pedagogic advice.

1 Kind en Gezin, Belgium
From that moment on child support was no longer an exclusive medical issue, but became a multidisciplinary matter including medical, social, cultural, pedagogic and psychological advice.

Child support enlarged into family support.

Good health evolved from a medical concern aimed at lowering infant mortality into a condition of absence of disease combined with social and pedagogic welfare. The good outcome cannot be attributed to the efforts of one organization, but also to cooperation with the other partners.

The preventive aims (screening, vaccinations, growth) can be monitored by means of electronic data collection implementing a survey output of the target group. This information is very important for everyone working in prevention and health care because it is the basis for programme adjustments.

IKAROS (Integrated Child Activity District Support System) enables nurses and physicians to learn about new births within hours instead of weeks so that babies' and mothers' health can be monitored more quickly. Information can be exchanged smoothly. Kind en Gezin focused on state-of-the-art technologies to develop and implement this information system to automate time-consuming management activities and proactively monitor systems activity to improve performance and data.

Vaccination data from infant welfare clinics together with those from private settings will be gathered in the Flemish Vaccination Databank (Vacc Vlaanderen) in the very near future. With the aid of this databank all physicians (working in private as well as in community settings) will be able to enter the vaccination data of every child. Statistical data on the vaccination status of Flemish children will be accessible.

As a result of a long research, Kind en Gezin started in 1997 a generalized programme of systematic neonatal hearing screening integrated in the existing preventive setting; the Algo-test (Automatically Auditory Brain Response-test) can detect hearing problems simply and effectively on a very young age of 2-4 weeks in order to start with new methods of treatment at an optimum age.

The relationship between K&G and healthcare medical associations remains very delicate, but working together and listening to each other can help a good deal. Actually, we all have the same aim: promoting the health of our children.
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THE IMCI STRATEGY IN THE REGION OF THE
AMERICAS: IMPACTS ON INFANT MORTALITY,
HEALTH CARE QUALITY AND CHILD DEVELOPMENT

Yehuda Benguigui

Introduction

Improving people’s health continues to be a major challenge for developing countries (1) and its prioritization in relation to children is critical (2). Simple prevention and treatment measures have been available during the last two decades, but still each year many children die or suffer from frequent episodes of diseases that can be easily and effectively prevented or treated (3). In some cases, those diseases result in temporary or permanent disability, with severe negative consequences for children’s growth and development.

The lack of access to available interventions for the prevention and control of those diseases, and inadequate care practices for children at home, with such negative consequences for children and their families, are due to a lack of information regarding healthy behaviours (3), lack of access to health personnel, and/or health facilities able to provide adequate treatment when a child is sick. Other deaths, and many episodes of diseases, could be avoided if children would receive health prevention measures, or if they were in better nutritional condition, the latter resulting from appropriate breastfeeding, weaning and feeding practices (4).

To reduce the incidence and severity of children’s diseases, families must have access to available strategies for prevention and treatment. Families also need access to information for health promotion, in order to improve current practices for caring children at home, thereby contributing to improving children’s growth and development. However, resources for increasing population’s access to health facilities and for a broad dissemination of information are scarce in most developing countries (5). Thus, the main challenge these countries face is to find ways to make a more efficient use of available resources for providing good quality care to children and their families and to disseminate key information for improving parents’ practices of children care in the home.

In support of countries’ efforts, the World Health Organization (WHO) and the United Nations Found for Children (UNICEF) worked

1 PAHO/WHO, Washington DC, USA.
together to elaborate a single strategy to improve the quality of care that children receive at home and at health facility levels (6). The strategy was designed to focus on the children's health condition as a whole instead of children's specific diseases, so as to avoid missed opportunities for early detection of problems and allow parents and health workers to take the appropriate actions.

The integrated management of childhood illness (IMCI) is the result of this joint effort and brings together all the previously available interventions for improving children's health. Moreover, by adapting the strategy to the particular epidemiological situation where it is applied, more actions for health promotion, prevention and treatment may be added, taking into account the availability of resources and the specific operative conditions of the country or region (7). By operating in this manner, IMCI increases the ability of health workers and parents to provide better quality care for children.

In the Region of the Americas, the Pan American Health Organization (PAHO), which acts as the regional office of WHO, launched IMCI in 1996 (8). From that year through 2001 seventeen countries have adopted the strategy, made adaptations to their particular epidemiological and operative conditions, and began its implementation2. Initial implementation targeted regions and areas with child mortality rate higher than 30 per 1,000 live birth, so as to broaden the important impact that IMCI would have in those particular contexts. Further expansion is currently underway in most countries, and IMCI is being used in most regions and areas, including those with lower IMR, due to the benefits of the strategy for children's quality of care at health facilities and at home.

An overview of childhood mortality and morbidity in the region of the Americas

PAHO estimates that more than half a million children under five die each year in the Region of the Americas, and around one up to three of those deaths are from infectious diseases and malnutrition (Figure 1). The importance of those diseases in the overall mortality of children under five is different and reaches 40% and more in some developing countries, while it is as low as 5% in developed countries of the Region3.
Figure 1: Distribution of deaths in children under five years of age in the Region of the Americas. Estimates from 1999

Diarrhoeal diseases and pneumonia are the leading causes of those deaths; and malnutrition contributes also to the death toll, being the main or the associated cause of most deaths from infectious diseases during childhood.

Infectious diseases are also the main cause of sickness during childhood. Acute respiratory infections, for example, affects children’s health at an average of four to five times a year during their early years; and in many developing countries, diarrhoea is also an important cause of children’s disease (9-14). ARI and diarrhoea, together with other infectious diseases, are then the cause of half or more of all hospitalizations in children under five, and the cause of 70% or more of all consultations to health facilities (Figure 2) (15).
Figure 2: Reduction in mortality from diarrhoeal diseases and acute respiratory infections in the Region of the Americas. Estimates for 1990, 1995 and 1999


Multiple factors account for this situation. The lack of knowledge and adequate practices for caring children at home place children in a greater risk for suffering infectious diseases and make them more severe when they hit the child (16). Lack or inadequate breastfeeding, poor weaning practices, inadequate feeding, and lack of hygiene, among others, are important causes of children being at risk of catching an infectious disease (17,18). Inability to perceive danger signs to look for care outside the home, together with less than adequate health providers, are additional problems that contribute to treatment delays and increase the risk of death (19-23).

In addition, large portions of the population have limited or no access to health facilities or personnel, which in turn reduces the chances for children to receive prompt care when sick or having access to preventive measures such as vaccination (24). In some cases, even though health facilities or personnel are available, the quality of care they provide is poor or limited (25). Short schedules for providing care, lack of medicines, difficult referral services for complementary diagnostic or treatment techniques, and even inadequate training of health workers are some of the main causes of poor quality care at first level health facilities.
Several specific interventions were implemented during the last decades to face these problems, vaccination probably being the most vastly known and the most successful (26). Interventions like the standard case management of diarrhoea or ARI were also an important contribution, not only to reduce mortality and morbidity, but also for improving the quality of care children receive at home and at health facilities (27-29).

A problem with the implementation of those strategies, however, was promptly identified: the use of single and specific strategies does not help health workers to see the child as a whole (30-31), and missed opportunities for detection of problems other than the cause of consultation were frequent (32-34). Those specific strategies also failed to disseminate systematic information and education regarding care of children at home, thereby failing to take advantage of the moment of consultation with the health worker or facility.

The integrated management of childhood illness strategy

The Integrated Management of Childhood Illness (IMCI) is a single strategy elaborated by the World Health Organization (WHO) and the United Nations Fund for Children (UNICEF). This strategy brings together all the available interventions for the control and prevention of the main causes of disease during childhood, and for health promotion of the growth and development of children (6). In its basic design (35-36), IMCI includes first checking for the main symptoms of common diseases affecting children in developing countries; thus including severe diseases such as pneumonia or meningitis, acute respiratory infections, diarrhoeal diseases, malaria and otitis. Secondly, IMCI includes the assessment of the child’s nutritional condition, and immunization status. Finally, IMCI provides all the instructions for treatment, including administration of medication, recommendations about how to care for the child at home, next control visit for checking progress of treatment, and when to seek for care immediately due to the worsening of the disease.

The strategy was designed in a way that allows further adaptation to the epidemiological conditions of each country, or even region inside the country; and to the operational resources that are available for its implementation (37-38). This includes the category and training of health workers who will be using IMCI, the availability of medicines and diagnostic technologies, the reference systems from first level health facilities to hospitals, among others.
The content of IMCI is not new, and is already included in several different strategies or in internationally disseminated bibliography (26-29). But IMCI brings together all that information in such a practical way that health workers, including not only physicians but also nurses and other auxiliary personnel, may use the strategy to provide care at first level health facilities. Therefore, IMCI results in the best available strategy for providing integrated and good quality care for children in developing countries where resources, both human and facilities, are very limited (39).

On the other hand, as the IMCI strategy provides information on practices for health workers and also for parents, its potential for improving children’s care may be expanded not only to health facilities and health workers, but also to the family.

In sum, by applying IMCI health workers may provide a good quality of care each time they are in contact with a child (40). At the same times, parents following IMCI recommendations for treatment, prevention and caring children at home, will give them the best possible protection to their health and will contribute to promote their healthy growth and development (41).

For the above-mentioned reasons, the main strength of IMCI is its potential impact for reducing mortality, preventing diseases and improving the quality of care. This last by reducing missed opportunities for early detection and treatment of diseases and for disease prevention (42), through a more rational use of medication (43) and by using the consultation for improving the knowledge and practices of parent’s for children’s care at home (44).

IMCI was launched by WHO in 1996 and in the same year PAHO launched the strategy and began the first implementation in selected countries (8). From that initial year, 17 countries of the Americas are now using IMCI after adapting the strategy to the particular conditions of them4. Expansion of IMCI is currently underway, both including increasing the population covered by the strategy and the incorporation of new components for health prevention, treatment of diseases and children’s health promotion.

Impact of IMCI on children’s health. The Healthy Children: Goal 2002 Initiative

On the basis of its potential impact, and the fast manner in which countries decided to implement IMCI, PAHO launched the initiative Healthy Children: Goal 2002, which proposes to reduce

100,000 deaths in children under five in the Region of the Americas during the period 1999-2002 (45). The initiative was proposed after analyzing the possibility of increasing the rate of reduction in childhood mortality, as a consequence of the expansion of IMCI strategy in countries, particularly providing access to the most vulnerable groups of the population, where most childhood deaths occurred.

First assessments made regarding mortality from diseases targeted by IMCI has shown an important reduction in the number, rate and percentage of deaths due to those diseases, when estimates for 1999 are compared with those for 1996. Analyzing data from the most important causes of mortality from diseases targeted by IMCI, that is diarrhoeal diseases and acute respiratory infections, a sustainable reduction is observed in the first one and an increasing rate of reduction in the last one (Figure 2).

Results from using IMCI were also obtained regarding the improvement in health workers performance and in parent’s knowledge on how to adequately care for children at home. The use of inadequate medication for the treatment of ARI in the health centre “La Vicentina”, in Quito, Ecuador, dropped by 95% by using IMCI. In the same centre, no antibiotics were used for the treatment of ARI no-pneumonia, but the use of antibiotics remained 100%5.

Assessments made in the Dominican Republic have also shown that the use of IMCI contributed to increase parental awareness regarding danger signs for early seeking of care from a health worker, and with regard to better care of children at home during diarrhoea and ARI episodes (44).

New perspectives for strengthening IMCI

Although the use of IMCI has all these benefits, some common child problems in developing countries are not widely covered by its content. This is particularly important in the Region of the Americas where mortality from diseases targeted by IMCI in its basic design represents less than 30% of all childhood deaths, with an increased rate of reduction in this burden6. In addition, health facilities and health workers using IMCI face also other health problems that children have, and which are the main reason for parents seeking

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5 Gavilanes E, G, Flores V, C, Pavón C, M, Palma P, L. Impacto de la estrategia atención integrada de las enfermedades prevalentes de la infancia sobre el uso de antibióticos para el tratamiento de las IRA y las EDA en el centro de salud “La Vicentina” de la ciudad de Quito. (en prensa).
care. These include, among others, obstructive respiratory diseases, such as asthma, accidents, child-abuse, and even some neonatal problems. Finally, although IMCI strategy has a strong component for prevention and health promotion, the content of these components are mainly related to the nutritional status, with no mention of developmental problems, i.e. their early detection and adequate treatment, together with the promotion of early stimulation.

Complementing the IMCI strategy by including the latter contents is becoming a priority, especially in the Region of the Americas, where some countries were already working on its design, with the support of the IMCI Regional Unit at PAHO.

Treatment and control of asthma and other obstructive respiratory diseases was one of the first contents that countries identified as necessary to be added to IMCI (46). One reason was because the assessment and treatment of wheezing mostly associated with obstructive respiratory diseases, was already part of the ARI control strategy, which was underway in most countries of the Americas. Moreover, asthma and obstructive respiratory diseases represent between 6% and 13% of all childhood hospitalizations and more than 25% of all children seeking care at first level health facilities. For this reason, the assessment and treatment of those problems takes at least one fourth of the time that health workers have at health facilities; and many of the children do not receive adequate assessment and treatment, including unnecessary or inadequate use of medication.

The other two contents that were identified as necessary to be included were the prevention and control of accidents, violence and child abuse, and the detection and adequately treatment of neonatal problems. This latter is a main problem, particularly in countries and areas were many children are born at home.

In the countries of the Americas, neonatal and perinatal problems represents the most important cause of death in children under one year of age: estimates from 1999 show that neonatal deaths accounted for more than 200,000 deaths, representing half of the total number of infant deaths (47,48). Although premature deaths were more than 40% of all those neonatal deaths, around 45% of all those deaths occurred after the first week of life.

Activities in progress regarding the neonatal component of IMCI’ includes the design and field testing of clinical charts for under-one-month infants, linking IMCI with pregnancy and birth care centres and in coordination with health services and midwives for healthy childbirth.

Regarding accidents, violence and child abuse, which account for around 20% of all deaths in children 1 to 4 years old (49,50),
clinical charts are also in the design process. These charts will lie out information to health workers for preventive recommendations to parents to avoid accidents during childhood. It will also provide health workers with practical procedures for early detection and treatment of child abuse. This last portion of additional IMCI content will also include a component for the support of community involvement in preventing and adequately treating child abuse and violence, and for preventing accidents at homes and in the community.

Two additional contents were identified to be included in IMCI, both related with further child growth and development that may have severe consequences if early measures are not taken: an oral health component and a developmental promotion component (51).

PAHO is currently working on the oral health component directed to promote early detection and treatment of cavities and to contribute to a more rational use of medication, especially antibiotics, which often are inadequately and unnecessarily used.

The developmental component is considered essential to promote a healthy start in life for children, which results not only from a good nutrition and from keeping children free of disease. IMCI already contributes to promote development in children. On the one hand, by keeping them free from diseases and by improving their nutritional condition, on the other, by improving the capacity of parents to provide better care at home. To increase the power of IMCI for improving children’s development, WHO and PAHO are working in designing and field-testing practical interventions that may be applied by health workers from primary level health facilities.

Support for implementing development care within IMCI has been part of WHO’s work during the past few years and is currently almost ready for launching at country level. The proposed interventions includes guidelines for feeding, play and communication, adapted IMCI training materials, including modules for health workers, facilitators and supervisors guidelines, mother’s counseling card and a training video. A series of technical seminars for decision-makers are part of the proposal, and will contribute to promote its adaptation and practical implementation in countries.

PAHO is also working on the basis of country experiences with the IMCI adaptation and implementation. Materials developed in Brazil include practical guidelines for the first level health facilities. These materials provide health workers a better understanding of developmental problems during childhood and give them practical procedures for early detection and treatment. The proposal
currently being field-tested in Brazil also provides simple tools for teaching parents how to provide care to their children for a better development.

Facing the challenge for scaling-up IMCI

In this context of continuous expansion, IMCI is going to be a stronger strategy for improving children’s health condition and for promoting healthy family behaviours that will contribute to a healthy start in life. And as the challenges for this expansion are big, the work to be done has to be bigger. The most important of these challenges includes introducing IMCI in Universities, accelerating the pace of training on IMCI, including the new contents for health prevention and promotion and for early detection and treatment of diseases, strengthening the community component, and the mobilization of resources.

Introducing IMCI in Universities is key for increasing and sustaining access of the population to the strategy. First of all by training students before graduation to make them able to apply IMCI. In most developing countries students have to work during one year in a health facility after completing their regular courses of medicine or nursing, and this is a condition for graduation. These health facilities are usually serving the most vulnerable groups of the population, and having students trained on IMCI will benefit them. Secondly, training students in IMCI during their regular courses will contribute to reduce the burden that training represents for countries at this moment. Finally, introduction of IMCI at Universities will also contribute to support the sustainability of the strategy, given the important referent role that professors exercise among health workers and the population in general.

Expansion of training will result not only from teaching IMCI at Universities, but also from diversifying the available courses and workshops for training on IMCI with the simultaneous application of relevant quality control. Although expanding training is essential for increasing access to IMCI its enhancement will require additional support.

Incorporation of new contents into IMCI, as already described, is essential to strengthen the ability of health workers and parents to adequately deal with the most common childhood health problems and diseases, and for improving their capacity for providing children adequate care and the environment for a healthy growth and development.
Thus, the 16 key family practices for improving children’s growth and development have to be more widely disseminated, as proposed by the Interagency Working Group on the Community Component of IMCI (IAWG). Those practices summarize the most essential knowledge and practices that parents’ need to use to caring for their children at home. Strengthening current efforts for increasing information, education and communication activities will contribute to have more children benefiting from adopting these practices.

But all the above can only be carried out if the necessary resources are obtained via their mobilization at local, national and international levels. Current national and international commitment to the improvement of children’s health conditions has generated important results by providing practical tools for reducing mortality and morbidity and helping families to provide their children a good start in life. The challenge is now to ensure that, all the knowledge and practical instruments available can be reached by each single child in the world. The commitment to succeed in achieving such a daunting task is a critical condition for a new and better future for all.

References


A RANDOMIZED TRIAL FOR THE EVALUATION OF A NEW MODEL OF ROUTINE CHILD HEALTH CARE IN OUAGADOUGOU, BURKINA FASO: THE EFFECTS OF CHANGING PRACTICES AND ATTITUDES OF THE HEALTH STAFF

Isabelle Francois¹, René Tonglet¹, Henri Compaore², Honoré Daoudongar Djimrassengar², Sabine Kima², Etienne Kabore², Michèle Dramaix¹, Philippe Hennart¹

Introduction

Child health and growth in developing countries has always been a challenging issue for public health managers. Growth monitoring (GM), promoted since the seventies as one of the key technologies for improving child’s health (1,2), is an intrinsic part of routine child care in many parts of the world. However, an ongoing controversy casts doubts on its effectiveness on the growth promotion of the young child (3-13).

There is also a lack of evidence on how the organization, content, frequency and timing of visits in a traditional well-baby clinic could be optimized. The content of the proposed services are often delivered as standardized packages on a predetermined scheduling pattern, leaving little initiative, responsibility and thus self-satisfaction to nurses. Moreover it weakens seriously the potential for adapting services to the needs of each individual child. Despite the well-documented advantages of the currently advocated patient-centred health care provision (14-16) and the fact that mother’s views are recognized as good predictive indicators (17,18) for child health, often little attention is paid to the views and demands of the children’s mothers.

Lastly, the continuity of the caregiver and the integration of care is not facilitated by the traditional organization of well-baby clinics, where services are usually handled by different health staff in successive places.

¹ Epidemiology Unit (UCL 30.34), School of Public Health, Faculty of Medicine, Catholic University of Brussels, Brussels, Belgium
² Centre Médical Paul VI, Ouagadougou, Burkina faso
During the last decade, the question of alternative strategies for promoting child growth started to raise international interest and advocacy was made for research on that topic (19). In 1995 a new strategy of care for the sick child was launched by WHO as, the Integrated Management of the Sick Child (20).

In this background, it appeared interesting to us to launch a research with the aim of evaluating the potential benefit of a new model of routine childcare on health and growth of the young child as compared to the standard strategy of care. This paper presents the results of a randomized-controlled trial conducted with this aim. We proposed an interactive model of care built around three major concepts:

- The reinforcement of the nurse’s autonomy in the decision making process;
- The importance given to the mother’s interview;
- The integration of care in time, place and person.

The research hypothesis was that this interactive model would improve the effectiveness of child care during the first year of life and lead to better health outcomes, by fitting more appropriately the children’s needs, increasing the concern and self-esteem of nurses and by enhancing the confidence of the mothers.

Subjects and methods

Settings

The study took place in the under-five clinic (U5C) of the Medical Centre Paul VI (MCP6), in Ouagadougou, Burkina Faso in Western Africa. This centre is one of the four district reference centres of the city and its U5C registered 2,139 new admissions in 1996, which represented 12% of all under-five new admissions of the city. The research project was nested within a technical support project to the district. Preliminary studies aimed at describing and assessing the functioning and performances of the U5C. With the collected information two conceptual strategies of providing care to the young child were proposed to be tested in a randomized clinical trial set-up.

Ethical approval

Study design and methods were approved by the ethical committee of the Catholic University of Louvain and by the health authorities in Burkina Faso.
Description of interventions

In the reference group (R), the strategy of childcare proposed, did not differ from the currently followed national strategy, except that efforts were made to improve its quality of care. It consisted of monthly weighting sessions with growth chart monitoring, and a standardized package of activities, which consisted of:

- A general interview;
- A specific interview on feeding practices;
- A general clinical examination;
- A specific clinical examination to search signs of malnutrition.

In case illness was suspected, the child was referred to the curative consultation, which was handled by another nurse. Vaccinations, wound dressing & injections were also performed in different places by different staff and with a waiting period in between each station.

The strategy of care proposed to the intervention group (I) was an interactive model of care. One nurse was in charge of all aspects of the consultation in one and the same place, from monitoring the children’s well being to curative care. The consultation started with two open questions to the mother on how she perceived her child’s health and her child’s growth. Based on the information collected during the interview, the nurse was free to choose which other diagnostic activities to perform, in order to assess properly the child’s health and growth. At the end, the nurse had to classify the child’s health in three different classes:

- A child without a health problem;
- The presence of (an) important risk factor(s)
- A sick child whose health problem has to be tackled immediately.

Based on this assessment, the nurse was also free to determine the date of the next appointment.

Some guidelines or recommendations were common to both strategies, such as:

- The use of standardized treatment algorithms in case of illness;
- The respect of a decisional tree in case of growth faltering (using height for weight and mid-upper arm circumference - MUAC-);
- A close follow-up of any child at risk.

Implementation of the trial

The consultations at the U5C were reorganized in two different circuits, each one corresponding to a specific strategy. Mothers arriving at the clinic waited in a common waiting room,
where a common session of information was organized for newcomers about the conduct of the trial and the randomization process. This was followed by health education messages. Afterwards, staff and activities were separated, except for the EPI activities, which were common to both groups for logistical constraints. Redistribution of health staff between the two strategies was done on a voluntary base: 2 nurses to the I group (running two consultations in parallel) and 3 nurses to the R group (one for the curative station and 2 in parallel for the weighting). The nurses were trained according to the specificity of their circuit. The head nurse and the medical doctor of the USC assumed daily close supervision and quality control. Overall co-ordination and supervision was done from Brussels.

**Study population & randomization**

The study population consisted of all newly registered children at the U5C, from August 97 to March 98. Block randomization at entry was done by groups of 10. Each randomized child was followed-up to the age of 12 months.

**Data collection and outcomes measures**

Measures of weight and recumbent height were performed on admission and at the age of 6 and 12 months. Data were collected about the child’s health status at each visit (i.e. anthropometry when performed, type of morbidity if sickness) and some operational aspects of the consultation (a.o. date of visit, person(s) in charge, diagnostic activities performed, date of next appointment). Additional data collection in the I strategy, included the mothers’ and the nurses’ perception on the child’s health and growth. A survey was organized after the study, aiming at tracing back all children that were lost to follow-up, in order to get the information about their vital status at the age of 12 months.

The study outcomes measured were morbidity, mortality and growth.

**Data management and analysis**

Data were entered on the microcomputers available on site and processed in Brussels, using the Epi-info software package and the SPSS 9.0 release for Windows. Simple descriptive and graphical methods were used for the preliminary statistical analysis of univariate data. Standard statistical methods were used for bivariate analysis. Multivariate analysis was performed using the linear regression, logistic regression and Cox survival analysis.
Timing

After a one month of piloting, the study was launched in August 1997. Enrolment at the U5C continued for 8 months. The data collection ended in March 1999. Database was ready for analysis on February 2001.

Results

Randomization

1,161 children were enrolled in the study during the recruitment period. 582 children were randomly allocated to the reference group and 579 to the intervention group. The groups were similar regarding age, nutritional status, birth history and socio-economic environment (Table 1).

Table 1: Characteristics of the two study groups

<table>
<thead>
<tr>
<th></th>
<th>Reference Group (n=582)</th>
<th>Intervention group (n=579)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age on admission (SD)</td>
<td>2.05 (1.15)</td>
<td>1.99 (1.09)</td>
</tr>
<tr>
<td>Sex Ratio (F/M)</td>
<td>0.97</td>
<td>0.99</td>
</tr>
<tr>
<td>Illiterate mother (%)</td>
<td>63.4</td>
<td>60.7</td>
</tr>
<tr>
<td>Illiterate father (%)</td>
<td>49.1</td>
<td>50.6</td>
</tr>
<tr>
<td>Age of the mother (SD)</td>
<td>25.3 (5.8)</td>
<td>25.3 (5.8)</td>
</tr>
<tr>
<td>Marital status of the father (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polygamous</td>
<td>83.4</td>
<td>80.9</td>
</tr>
<tr>
<td>Monogamous</td>
<td>16.6</td>
<td>19.1</td>
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<td>Number of children in the household who died before the age of 5 years (%)</td>
<td></td>
<td></td>
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<tr>
<td>0</td>
<td>76.2</td>
<td>77.6</td>
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<tr>
<td>1</td>
<td>16.6</td>
<td>17.2</td>
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<td>&gt;=2</td>
<td>7.3</td>
<td>5.2</td>
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<tr>
<td>Number of brothers or sisters (%)</td>
<td></td>
<td></td>
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<tr>
<td>0</td>
<td>34.2</td>
<td>37.1</td>
</tr>
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<td>1-3</td>
<td>50.9</td>
<td>43.0</td>
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<td>&gt;=4</td>
<td>14.9</td>
<td>19.9</td>
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<td>Nutritional status on admission (SD)</td>
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<td>Mean weight for age Z-score</td>
<td>-0.10 (1.08)</td>
<td>-0.15 (1.06)</td>
</tr>
<tr>
<td>Mean height for age Z-score</td>
<td>-0.28 (1.13)</td>
<td>-0.38 (1.18)</td>
</tr>
<tr>
<td>Mean weight for height Z-score</td>
<td>-0.09 (0.96)</td>
<td>-0.10 (0.96)</td>
</tr>
<tr>
<td>Prevalence of wasting (WHZ &lt; -2SD)</td>
<td>1.4%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Prevalence of stunting (HAZ &lt; -2SD)</td>
<td>6.9%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Place of birth (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Home</td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td>- Maternity of CMP6</td>
<td>71.0</td>
<td>64.9</td>
</tr>
<tr>
<td>- Other place</td>
<td>26.1</td>
<td>32.0</td>
</tr>
<tr>
<td>Prematurity (%)</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Mean birth weight in kg (SD)</td>
<td>2.94 (0.45)</td>
<td>2.89 (0.44)</td>
</tr>
<tr>
<td>Mean height at birth in cm (SD)</td>
<td>48.5 (2.7)</td>
<td>48.7 (2.3)</td>
</tr>
</tbody>
</table>
Follow-up completion

Mean length of follow-up was 7.8+-3.7 months in the R group and 8.2+- 3.5 months in the I group (p=0.56). The total observation time amounted respectively to 4,565 and 4,733 child-months. 69% of the randomized children in both groups underwent the nutritional assessment foreseen at 6+-1 months. 49% and 51% of the I and R children respectively underwent the nutritional assessment foreseen at 12+-1 months. Information on vital status at the age of 12 months could be gathered for 463 (79.6%) children in the R group and 460 (79.4%) in the I group. The reasons for ending the study are presented in table 2.

Table 2: Reasons for exit the study

<table>
<thead>
<tr>
<th></th>
<th>Total N=1161</th>
<th>Reference group N=582</th>
<th>Intervention group N=579</th>
</tr>
</thead>
<tbody>
<tr>
<td>End of study (*)</td>
<td>647 (55.7)</td>
<td>326 (56.0)</td>
<td>321 (55.4)</td>
</tr>
<tr>
<td>Death</td>
<td>37 (3.2)</td>
<td>23 (4.0)</td>
<td>14 (2.4)</td>
</tr>
<tr>
<td>Change of address/transfer of U5C</td>
<td>107 (9.2)</td>
<td>49 (8.4)</td>
<td>58 (10.0)</td>
</tr>
<tr>
<td>Abandon</td>
<td>247 (21.3)</td>
<td>126 (21.6)</td>
<td>121 (20.9)</td>
</tr>
<tr>
<td>Unknown</td>
<td>123 (10.6)</td>
<td>58 (10.0)</td>
<td>65 (11.2)</td>
</tr>
</tbody>
</table>

(*) being defined as “attended the UCS during the 12th – 14th month age period”. Children who were last seen before their birth birthday but had undergone a final nutritional assessment after their eleventh month were considered as well as “end of study”.

Process of care or application of interventions

During the study period, a total of 11,180 consultations were performed (5,899 R- 5,281 I). The reasons for consultations were distributed similarly in both groups: routine control visit (76%), illness episode (11%), control visit after illness episode (10%) and others (2%).

In the R group, 12% of the children attending the weighing session have been referred to the curative consultation, while one third of all encountered morbidity episodes (new or old cases) have directly been handled at the weighing post. During the follow-up period, the mothers of the I group met a significantly lower number of different interlocutors than their counterparts of the R group (respective median values of 2 and 4, p=0.000, Mann-Whitney).

The content of the monitoring consultation differed between groups, in terms of type and frequency of diagnostic activities performed. We calculated the difference (d) between the expected number of activities to be performed during a child’s follow-up if the standard package and the observed number of activities really
performed. As expected, a very different R and I pattern was observed. For the R consultations, weighing and use of the growth chart have been key routine components. Similarly, the conduct of an interview -general or nutritional-, and a clinical examination -general or focusing on signs of malnutrition- were routinely done in the reference group (median d = 0 for all these activities. On the opposite, the I consultation appeared much less homogeneous and standardized. The weighing (median d= 1) and use of growth chart (median d= 2) stayed the most used diagnostic activities but were not systematically performed. The interview on feeding (median d=2.0), the general clinical examination (median d=5) and search for clinical signs of malnutrition (median d= 6) were activities quite often discarded in a routine visit. The only activity which has been routinely performed was a general interview (median d=0), as requested in the study protocol. The measurement of the height, and the computation of weight for height indices, were activities that had been proposed as "second step" diagnostic tools in an algorithm common to both strategies. They were equally used in both groups (median d = 5).

The scheduling of the monitoring consultations was on average less frequent in the I group. Mean planned delays (+-SD) between two consultations of growth monitoring (not including those when the child was diagnosed sick) were 4.4 +-1.6 weeks in the I group versus 3.7 +-0.9 weeks in the R group (p=0.000 t-test). Analysis over time shows that the initial pattern of follow-up was similar in both groups and that the discrepancies appeared only at the 4th visit, which corresponds to the end of the immunization calendar (indeed, at that time, 72% of the children in both groups have already been vaccinated). Mean planned delays for the 3 first visits pooled together were 4.1+-1.6 weeks in the R groups and 4.4 +-3.2 weeks in the I group (p=0.161, M-W). Mean planned delays for the second set of the 4th till the 6th visit were 3.6+1.1 weeks in the R groups and 4.3 +-1.5 weeks in the I group (p=0.000, MW), while for the next 7th till 9th visits they were 3.3+-1.4 weeks in the R groups versus 4.6 +-2.1 weeks in the I group (p=0.000, M-W). From the 10th visit on, they were 3.3+-1.2 weeks in the R groups and 4.8 +-2.0 weeks in the I group (p=0.000, M-W).

In the I group, the number of monitoring consultations for the child who was aged less than 3 months old at entry and attended the 12th month visit, was significantly lower than in the R group (median of 8 versus 10, p=0.000).

The compliance of the mothers to the given appointment was not different between groups: 62% of all R consultations and 60% of all I consultations happened at the date of appointment +-1week (p=0.12).
In total, 730 (62.9%) children of the 1,161 children entered in the study have been fully immunized before their first birthday. The immunization coverage among children who completed the follow-up was 91.1% in the R group and 87.9% in the I group (p=0.18). Weaning happened slightly earlier in the R group than in the I group (respectively at the mean age of 5.6 (1SD) months and 5.9 (0.6 SD) months p=0.000).

Clinical outcomes

Morbidity

Spontaneous consultations for a new illness episode were equally frequent in both groups (medians of 9.8 consultation per 100 child-months). There was no difference neither concerning the frequency of follow-up visits for one morbidity episode (median for both groups of 0.0 consultations per 100 child-months). The morbidity profile appeared similar in both groups. The detection rate of a new illness episode was identical in the R and I group with a median of 28.0 new episodes per 100 child-months.

Growth

We have observed that the weight growth pattern did not differ between groups but that the height growth did. The height growth velocity was significantly higher in the I group, with a difference of 0.2 cm/month during the period running from admission up to the age of 6+-1 months (p=0.000) and a difference of 0.05 cm/month (p=0.035) during the period running from admission up to the age of 12+-1 months. (Table 3). The multiple regression model did not highlight any confounding effect nor provided any gain of precision in assessing the effect of the allocation group on the height growth velocity.
Table 3: Comparative growth in the two study groups from admission up to the age of 6+-1 months and from admission up to the age of 12+-1 months.

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>Reference Group</th>
<th>Intervention Group</th>
<th>Reference Group</th>
<th>Intervention Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean WAZ (SD)</td>
<td>-0.72 (1.03)</td>
<td>-0.72 (1.06)</td>
<td>-1.66 (1.10)</td>
<td>-1.80 (1.05)</td>
</tr>
<tr>
<td>Mean WHZ (SD)</td>
<td>-0.34 (0.98)</td>
<td>-0.53 (1.07) &lt;0.005</td>
<td>-1.06 (1.00)</td>
<td>-1.23 (1.01) 0.061</td>
</tr>
<tr>
<td>Mean HAZ (SD)</td>
<td>-0.63 (0.93)</td>
<td>-0.41 (1.13) &lt;0.05</td>
<td>-1.07 (0.99)</td>
<td>-1.07 (1.13)</td>
</tr>
</tbody>
</table>

Growth from admission up to 6+-1 months old

<table>
<thead>
<tr>
<th>Growth</th>
<th>Reference Group</th>
<th>Intervention Group</th>
<th>P value (T-test)</th>
<th>Growth from admission up to 12+-1 months old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean wt gain, kg (SD)</td>
<td>2.04 (1.14)</td>
<td>2.14 (1.03)</td>
<td>0.156</td>
<td>Mean wt gain, kg (SD) 3.28 (1.38) 3.31 (1.16) 0.773</td>
</tr>
<tr>
<td>Mean wt /age gain, z-score (SD)</td>
<td>-0.63 (0.88)</td>
<td>-0.60 (0.88)</td>
<td>0.595</td>
<td>Mean wt /age gain, z-score (SD) -1.69 (1.06) -1.72 (1.00) 0.656</td>
</tr>
<tr>
<td>Mean wt growth velocity, kg/month (SD)</td>
<td>0.48 (0.22)</td>
<td>0.51 (0.22)</td>
<td>0.056</td>
<td>Mean wt growth velocity, kg/month (SD) 0.32 (0.12) 0.32 (0.10) 0.957</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mortality</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 (2.0%) children of the I group died before their first birthday against 23 (4%) for the R group, representing a relative risk in terms of incidence density of 0.59 (95%CI 0.30-1.15).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bivariate analysis showed a significant association between three characteristics of the children at entry and the higher occurrence of death, i.e.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• An age higher than 2 months at entry (p=0.0005);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Birth outside of maternity of MCP6 (p=0.038);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The history of 2 or more children in the household who died before the age of 5 years (p=0.009).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sex, birth history, nutritional status on admission and others indicators of family status (i.e. parents literacy level, parents age, marital status of the father) were not associated with death. The Cox proportional hazards model considered four independent variables: the three factors revealed by the bivariate analysis and the allocation group. The adjusted hazard ratio (HR) for the intervention group versus the reference group was 0.56 (0.28-1.10; p = 0.092).

Children aged 2 months or less at entry appeared to be less at risk than those older than 2 months (HR 0.31 (0.16-0.63); p=0.001). Children born at the maternity of MCP6 survived better than those born outside (HR 0.45 (0.23-0.87); p=0.018). Living in a household where not more than one child had died before the age of 5 years was also a protective factor (HR 0.36 (0.15-0.87); p=0.023). Adjusted survival curves in the two allocation groups are presented in figure 1.

Figure 1: Survival curves
Discussion of the results

Limitations of the study

The study design and the use of multivariate modelling techniques make us feel confident that the study results have not been confounded. Concerning the possibility of bias, the two groups did not differ in regards to he reliability and completeness of data collection in both groups, the quality of anthropometric measurements nor the competence of health staff in charge in following diagnostic and treatment algorithms. This, together with a sustained supervision and regular training in both groups, make us confident about the fact that there was no reporting bias and that the technical competence of nurses in both groups was similar. We did neither observe that the voluntary-based assignment of nurses to an intervention group led to different motivation, nor that the two groups differed in regard to the natural charisma and popularity of the nurses. Two of the 3 nurses in the R group had to be replaced during the study period because of external constraints, while the two nurses in charge of the intervention group have been maintained. This turnover certainly accounts by itself for the observed difference in the number of interlocutors met by the R and I mothers during their child’s follow-up. We can not exclude that this turnover might also have affected the quality of work, but as training and supervision has been continued, we think it did only transitorily and minimally affect the other study results.

There was a similar proportion of lost of follow-up cases, in each study cohort. The proportions of abandon, transfer, change of houses or unknown were also similar in both groups. No difference in the length of follow-up was noted. The overall proportion of lost to follow-up might appear high but it should be reminded that the study was run in a routine setting, where attendance rate drops after the immunization period, and that we did not make any effort to obtain the highest level of follow-up completion because attendance was considered as an interesting study outcome. We could obtain a valid information on the vital status at the age of 12 months for 79% of the children in both groups. We do not have any reason to think that the children lost for follow-up did differ between groups regarding their probability of having died before age 12. They might, as a group, have been exposed to a higher mortality rate. We are aware that the difference in survival between groups is borderline significant and that we have a 9% probability that it occurred purely by chance. Therefore, this potential impact on child survival is to be considered with caution, although it seemed likely in regards to the concomitant and highly significant impact on
height growth and the well documented link between stunting and mortality (21-23).

Clinical outcomes

Our findings support the research hypothesis. Although the child followed in the intervention arm was as likely to be diagnosed sick and was gaining weight at the same rate, he enjoyed better survival and better height growth. Concerning the observed difference in height growth between the two study groups, this impact raises great potential interest for public managers, as stunting is a challenging issue for the coming years and many questions remain concerning its determinants and vulnerability. In our study, it is interesting to note that the better height growth is limited to the first six months of age period and that it is still visible, although attenuated, at 12 months of age. It could be linked to a higher vulnerability of the young child to this type of intervention because growth velocities are higher at earlier ages. We think that further data analysis and research are needed to highlight this growth dynamic and the underlying mechanism.

Process of care

The observed I and R pattern of using diagnostic activities and scheduling monitoring visits can be described as an “opportunistic” approach versus a “normative” one. The I nurse obviously adapted behaviour to each case, as taught. We report that the I nurses felt a greater feeling of self-esteem, sense of responsibility and professionalism on various debriefing and assessment sessions. This was proudly summarized by one of them, who told us: “The new strategy makes me feel responsible for the child.”

The fact that the I mother was given that central role in the consultation could have enhanced a better communication pattern and an increased confidence. However, if so, we did not see any impact on the compliance of the mother to the rendezvous given and the number of abandoned or lost to follow-up was the same. We did not notice neither an increased number of spontaneous consultations for a sick child, which could have witnessed an impact on the health seeking behaviour.

Finally, we report also here the valuable observation that health staff of the U5 clinic spontaneously and enthusiastically adopted the interactive model after the RCT, without waiting for the results of the trial. For them, this model was obviously more satisfying.
Conclusion

Although it certainly has its limitations, we think that this RCT can bring objective and valuable insight to the current problematic of promoting child growth and health in developing countries. Probably the reinforcement of the nurse's autonomy in the decision making process and the importance given to the mother's interview in the proposed interactive model of care seems to have had most influence on children's growth & survival.

In how far this is based on a more responsible & professional follow-up of the children or due to an improved psychosocial environment created or by a combination of both factors can not be demonstrated here. The observed effects on the children's well being and the voluntary adoption of the interactive model of care by the CMP6 should, however, trigger further interest from researchers and public health managers.

Acknowledgements

For the implementation of this RCT, we would like to thank the Health staff of the CMP6 and all the patients who have been enrolled.

Funding: Convention de recherche du Fonds National de la Recherche Scientifique Médicale, Belgique, n° 3.4510.96). Fonds spéciaux de recherche de l'Université Catholique de Louvain-

Conflict of interest: none

References


DEVELOPMENT AND TESTING OF AN INTERVENTION STRATEGY FOR IMPROVING PARTICIPATION OF PARENTS IN PROMOTION OF GROWTH AND DEVELOPMENT OF PRE-SCHOOL CHILDREN IN BOLIVIA

Edgar Sejas¹, Tom Hoeree², Daniel Illanes¹, Caroline Mejean³, Bernard Maire³, Edgar Arduz¹,

Introduction

Earlier studies indicated a limited participation of the parents of pre-school children in the growth monitoring and health promotion programme (GMP) of the Ministry of Health of Cochabamba province - Bolivia. A lack of communication skills and tools for the health personnel were believed to be - at least partially - responsible for this. The objective of this study was to design and test an intervention strategy for improving communication between both caregivers and caretakers.

The results of a first series of studies using focus groups and individual interviews (reported elsewhere) made clear that parents were demanding for more information and explanations on their children’s health status from the health personnel. But that on the other hand, health personnel did not consider this part of the health promotion activities as a priority within their task description. Therefore, a manual - in the form of a booklet - was developed explaining in clear and simple messages how to take care of the basic health needs of pre-school children. This manual covered dietary advice, developmental milestones and growth patterns of children and the different points of attention of a comprehensive preventive paediatric consultation. During a two-day training workshop, the manual was introduced as a communication and education tool for all health personnel. The essentials of growth and development of children were refreshed and communication skills were exercised. The manual was then distributed to all mothers attending curative and preventive services.

¹ Department of Sociology, University Mayor of San Simon, Cochabamba, Bolivia.
² Nutrition and Child Health Unit, Institute of Tropical Medicine, Antwerp, Belgium.
³ Institut de Recherche pour le Développement, Montpellier, France.
Methods

The intervention, as described above, was tested in Cochabamba province - Bolivia - in an urban and rural health centre, with an estimated population of responsibility of respectively 36,000 and 15,000.

During the process of implementation two group discussions were held with the health personnel of each health centre. These focussed on problems encountered during implementation and their perceptions of the usefulness of the manual and its acceptance by mothers consulting.

After 2.5 months of implementation an external researcher conducted interviews with individual mothers exiting the consultation room. Questions related to their number of and satisfaction with the explanations given by the health staff on the health status of their child. Between April and July 2001, 65 interviews were conducted. 17 were conducted in the urban health centre and 16 in the rural centre where the manual was introduced. And respectively, 18 and 14 interviews were conducted at non-intervention sites. All interviews were tape recorded and transcribed and answers were encoded and analyzed using QSR Nudist software.

Results

The group discussions indicated that the manual and the training responded to a felt need of the health personnel. Their confidence had grown in addressing the subject of health promotion with the mothers. They also felt that mothers did respond much more eagerly to their explanations than they did in the past (see Table 1). Finally, the manual seemed to provide the mothers with an opportunity - which did not exist in the past - to consult specifically for their worries on the diet of their children.

Table 1: Most frequently mentioned benefits of the manual by health personnel

<table>
<thead>
<tr>
<th>Health personnel declared, that</th>
</tr>
</thead>
<tbody>
<tr>
<td>- they had more confidence in addressing health promotion issues with mothers</td>
</tr>
<tr>
<td>- mothers responded positively to their explanations and advice</td>
</tr>
<tr>
<td>- some mothers even consulted specifically for advice</td>
</tr>
<tr>
<td>- the manual responded to their and caretakers information needs</td>
</tr>
<tr>
<td>- they provided more systematically health education</td>
</tr>
</tbody>
</table>
The analysis of the exit interviews with the mothers shows that advice is now more frequently given during consultations. Mothers also indicated to be very satisfied with the explanations given with the help of the manual. In table 2, frequency of advice given per consultation are presented.

**Table 2: Percentage of mothers indicating having received advice on specified topics during preceding consultation**

<table>
<thead>
<tr>
<th>Advice received on:</th>
<th>Urban without manual</th>
<th>Urban with manual</th>
<th>Rural without manual</th>
<th>Rural with manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing of complementary food</td>
<td>67 %</td>
<td>100 %</td>
<td>64 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Preparation of complementary food</td>
<td>67 %</td>
<td>94 %</td>
<td>21 %</td>
<td>93 %</td>
</tr>
<tr>
<td>Frequency of meals per day</td>
<td>56%</td>
<td>94%</td>
<td>21%</td>
<td>67%</td>
</tr>
<tr>
<td>Language and motor development</td>
<td>46 %</td>
<td>53 %</td>
<td>10 %</td>
<td>52 %</td>
</tr>
</tbody>
</table>

**Discussion & conclusions**

Although, these results are very encouraging, they should be interpreted with caution. Increased provision of information could have been the sole result of the recent training and not of the manual per se. However, health workers did indicate that the manual was a support during their routine activities. Also for the parents the manual was felt to have an additional value. They in particular felt, that the manual gave them more self-confidence to discuss growth and development of their children with the health staff. So, the manual seemed to motivate the health workers to provide and the parents to use, improved promotional services. So, these results seem to indicate a marked improvement in the communication between caregivers and caretakers.

Further evaluation needs to be done in order to understand the long-term effects of this new intervention strategy on communicative behaviour of the health personnel, as well as, on whether the provided information was assimilated and has introduced changes in child rearing practices of the caretakers.
INTRODUCTION

Despite impressive gains, malnutrition till to date remains as one of the biggest Public Health Problems in many low-income countries including Bangladesh. Currently 51 percent children in Bangladesh are underweight (low weight for age), 49 percent stunted (short for age) and 12 percent wasted (low weight for height). 45 percent of the babies are born with low birth weight and only 13 percent children are exclusively breastfeed for complete 5 months. More than 45 percent of mothers have low BMI (<18.5). High rate of malnutrition not only negatively influences the physical growth, mental capacity, learning ability and productivity but is also one of the most important causes of deaths among children in Bangladesh. Many achievements are undermined by the current infant mortality rate of 57 per 1000 live births (1) and child mortality being 118 per 1000 1-4 years children (2).

The Bangladesh Integrated Project (BINP), initiated in 1996 in six thanas (lowest administrative unit) and covers over 12% of rural communities (60 thanas), is now one of the major large scale nutrition programmes among developing countries funded by the World Bank. The project is heading for another expansion as National Nutrition Project that will cover the whole country in 10 years time. BINP includes a broad range of activities but is more known for it’s community based nutrition component which provides nutrition services- growth monitoring, nutrition counselling and food supplementation for those found to be nutritionally at risk. It is directed primarily at children under the age of two and pregnant and lactating women. These service are offered at the community level through community nutrition promoters (CNP) supervised by Community Nutrition Organizers (CNO). Growth monitoring and supplementary feeding takes place at the Community Nutrition Centres (CNC), a space offered by any

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1 Save the Children, UK
village volunteer to carry out the activities during a certain part of the day.

Though appreciated by many people in the Bangladesh, SC-UK could not agree to the overemphasis of caring practices and undermines the economic opportunities in the project design, SC-UK had initiated a small pilot with the following objectives:

- Enhance the capacity of the mothers to manage and handle malnutrition at the household level using available resources in the community;
- Explore the feasibility of participatory approaches to ensure community ownership in nutrition activities;
- Look for an alternative to the supplementary feeding programme by external sources and try something within the opportunities of the household members.

Materials and methods

The study was conducted at Kotchandpur - a rural area of Bangladesh covering a population of 16520 (6048 households) during July 1998 to June 2000.

Intervention

Since the project aimed at enhancing community capacity and exploring the feasibility of participatory approaches, one of the main strategies of working was to identify self-help initiatives (SHIs) and work through them in the community. 13 such SHIs identified (one in each village) were identified to start as an entry points to those communities. Later the activities stretched to women groups also. A total of 10 Community Nutrition Workers (CNW) were recruited locally from the same villages where they had to work and were provided hands on trained by experts on nutrition and participatory methods. CNWs applied participatory methods like Participatory Rapid Appraisal (PRA), Focus Group Discussions (FGD), Participatory Planning Process (PPP) etc. methods to build a confident relationship with the community, identify problems, find possible solutions, make an action plan to materialize the proposed solutions to reduce the gap between the desired situation and the reality. As an outcome of the PPP, one of the activities identified by the community was to demand/receive training from the project on nutrition and health issues. The other major decision was conducting growth-monitoring a session once in every month for each village or in the area of the SHI. Growth monitoring sessions started in any of the volunteer’s or influential people’s house
(courtyard), eventually it merged with the EPI (Expanded Programme on Immunizations) session organized by the Public Health Service Provider (called Health Assistant or HA). At the initial stages of the project implementation, the CNWs used to inform the mothers of under 3 years old children and pregnant women a day before the day of happening of the event, later the volunteers played this role. However, once vaccinated, the children were weighted and recorded on a health card. From the weight chart the mothers could get an idea about their children’s improvement of their health status (reflected in the weight chart). Nutrition counselling and cooking demonstration were also part of the growth monitoring sessions where the weighing, charting, nutrition counselling and cooking demonstration were done by the volunteers whereas the immunization and medical consultations were done by the HAs. No supplementary foods were provided, but mothers were taught how to prepare nutritious infant feeds at home using available resources around them. Those who could not attend the sessions or who were found to have a severely malnourished child were visited at home by the CNW. A thorough problem solving exercise was done with the household in order to find a workable solution and opportunities within the available resources. The pregnant mothers were advised about the importance of ante and postnatal care. In the later of the project activities, the CNWs encouraged the mothers to organize groups, make savings and receive credits or skill training in addition to their meeting and discussion on nutrition related issues.

**Pre (baseline) & Post-intervention (evaluation) surveys**

Pre (baseline) & Post-intervention (evaluation) surveys were done in 1998 and 2001 respectively. A total of 547 households were taken as sample during baseline while it was 563 during evaluation. Same households were interviewed twice but the number increased during evaluation due to the creation of new households by splitting the old ones. The samples were selected using systematic random sampling method by taking every eighth household. The anthropometric measurements were done with all the under five children available in those households. The number of under five children that was 222 in the baseline survey, it was 234 in the post intervention survey.

Data were collected administering a four parts interviewing schedule. The first part was used to identify respondents’ demographic & economic characteristics of the household, food practice and toilet facilities. The second part was applied only to the mothers with under-five children. Third part was used to collect
information on knowledge and practices about mothers’ pregnancy status, delivery facilities, family planning and breastfeeding practices, immunization status, childhood diseases and nutritional status of the children. It also collected information on hand washing after defecation and mothers’ knowledge about and practices during pregnancy period. The fourth and last part of the questionnaire addressed the questions regarding knowledge of the respondent about their benefit from the project, participation in growth monitoring and knowledge on some common nutrition issues.

The questionnaire was partly pre-coded and partly open-ended. After coding of the open-ended questions the data were entered in the computer using software based on ‘Foxpro’. There were logical checks available in the software which did not accept any irrelevant data (like inconsistent, impossible or beyond range). Finally, the analysis was done using SPSS for Windows (version 9.0). For anthropometric analysis, EPI-Info (EPINUT) was also used.

Focus Group Discussions

Focus Group Discussions were conducted during and after the survey to get a better explanation of the quantitative data and also to understand the procedure of initiation, continuation and completion of the activities, process outcome and means of sustainability of the project activities both programmatically and financially.

Results

About 41 percent respondents were found illiterate during baseline survey, which reduced to 39 percent during post intervention survey. The proportion for non-formal education was 20 percent and 18 percent respectively. Approximately half of the respondents were found engaged in agriculture related works during both the surveys with a slight increase in the sharecroppers (26% to 28%). 21 percent of the respondents had owned some amount of agricultural land. About 26 percent respondents were the members of some co-operatives, savings groups or income generating activities during baseline survey that increased to 36 percent during evaluation.
Ownership of land is one of the major determinants of socio-economic status of households in rural Bangladesh. Only 6 percent respondents were found to have no homestead land during baseline survey that reduced to 4.8 percent during evaluation period. Proportion of households possessing at least 10 decimals of homestead land decreased from 71 percent during baseline to 59 percent after 2 years (p=0.000). Those having land between 11-20 decimals or more than 20 decimals increased significantly from baseline to evaluation (14% to 23%, p=0.000 & 9% to 14%, p=0.007 respectively) survey period indicating a better socio-economic status of community. There was also a positive trend in case of ownership of cultivable land but not so distinct like the homestead land and those are not statistically significant.
There was an improvement found in using housing construction material also. Proportion of houses with straw/leaf/bamboo thatches have decreased (32.4% to 22.3%, \( p = 0.000 \)) while the proportion increased in case of tin-shed (46.9% to 68.1%, \( p = 0.000 \)) and concrete (5.9% to 8.0%, \( p = \text{NS} \)). Proportion of household with walls made of mud, brick and tin were 69, 24 and 1 percent respectively. The corresponding figures during evaluation were 67, 25 and 2 percent respectively. There have also been increases in proportion of households with television (5% to 11%, \( p=0.000 \)), and cupboard (14% to 19%, \( p=0.01 \)).

Information on household agricultural products was divided into two categories: one was rice or wheat and the other comprised of all other products. About 30 percent produced their subsistence for the whole year whereas 22 percent had it for six months. The proportions are similar both during baseline and evaluation surveys.

Questions were asked on the availability of domestic animals and their numbers. Ownership of milking cows and milking goats increased (19.2% to 24.9% and 10.6% to 14.4%) whereas ownership of cow/buffalo and goat/sheep decreased (55.4% to 49.9% and 47.3% to 43.7%). Ownership of duck and hens increased by more than 6 percent (74.9% to 81.7%) whereas, the ownership of pigeons has decreased a little (18.5% to 18.3%).

The mean and median expenditure on food was Taka 1710.52 and 1500.00 during baseline survey that was Taka 1793.90 and 1600.00 respectively during evaluation survey (\( p=0.000 \)). Mean education cost per family per month increased from Taka 252 to Taka 308 (\( p=0.000 \)) and the finding is very similar in case of conveyance also. Monthly expenditures on other items have also increased during evaluation than during baseline survey period.

Information on expenditures of some special items like treatment, clothing and social functions was calculated yearly. Proportion of households who spent Taka 1000-5000 for treatment and clothing purposes during baseline survey has now remarkably increased from 38 percent to 46 percent and from 72 percent to 83 percent respectively. Mean treatment cost per family per year increased from Taka 2843 to Taka 3664 (\( p=0.005 \)).

The situation of exclusive breastfeeding practice rate deteriorated over time. The rate against zero months increased to 94 percent during evaluation that was 93 percent during baseline survey. Exclusive breastfeeding rate for both 2 and more than 2 months old children were 1.7 percent and 2.1 percent during post-intervention that was 1.4 and 1.8 percent respectively at the time of baseline survey (\( p=0.556 \)).
The situation in terms of breast-feeding seems to have improved during evaluation. Only about 6 percent mothers were exclusively breast-feeding their babies that increased to about 16 percent during evaluation. Similarly the proportion of the households who were giving honey to the new-born as their first food also decreased from 69 to 51 percent (p=0.001). More than one fifth of the respondents stated that they left out some of the colostrum before giving it to the new-born. The situation has improved during evaluation (22% to 14%, p = .042). Prevalence of diarrhoea decreased by 5 percent (p=0.097) and ARI decreased by 10 percent (p=0.000) respectively.

The situation also improved in terms of mother's age of first childbirth. About 8 percent mothers during baseline survey had given the birth of their first child before 15 years of age but the proportion decreased to 3 percent during evaluation survey period (p=0.047). Other caring practices related to pregnancy also improved. At the time of base-line survey, only about 29 percent mothers could reduce their work load during pregnancy that during evaluation increased to 47 percent (p=0.015). Proportion of pregnant women who had been able to extra food during pregnancy was 21 percent during baseline that increased to 30 percent during evaluation (p=0.000). Major changes were also found in sanitation and hygiene practices. Proportion of respondents who had no fixed place for defeation had decreased from 51 percent to 31 percent while the percentage of hanging latrine remained the same (1.5 and 1.2 percent). On the other hand, fixed well or ditch for defeation rate increased from 35 percent from 54 percent (p=0.000) and sanitary latrine increased from 12 percent to 14 percent.

Daily dietary intakes of potatoes have increased from 56 percent households in base line survey to 88 percent (p=0.000) during evaluation. The proportion of milk intake has increased by 3 percent (22 vs. 25%, p=0.005), eggs by 3 percent (4 vs. 7 %, p=0.006) and ruti by 9 percent (4 vs. 13%, p=0.000) from base line to evaluation survey period.

Rates of malnutrition (less than – 2 z score) have declined by 11 percent (43 vs. 32%, p=0.015) for stunting (height for age) and by 7 percent (45 vs. 52%, p=.01) for underweight (weight for age) in between the baseline and evaluation survey periods. Rate of wasting (weight for height) remained static around 14 percent during both the periods of surveys.
Table 2: Distribution of the respondents according to health and nutrition status

<table>
<thead>
<tr>
<th>Variables</th>
<th>Baseline</th>
<th>Post Intervention</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of diarrhoea</td>
<td>17.2</td>
<td>11.8</td>
<td>0.097</td>
</tr>
<tr>
<td>Prevalence of ARI</td>
<td>19.5</td>
<td>9.3</td>
<td>0.000</td>
</tr>
<tr>
<td>More than usual rest taken during pregnancy</td>
<td>37.6</td>
<td>43.6</td>
<td>0.185</td>
</tr>
<tr>
<td>Could abstain from heavy work during pregnancy</td>
<td>29.0</td>
<td>47.3</td>
<td>0.015</td>
</tr>
<tr>
<td>First food to the new-born</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honey</td>
<td>68.9</td>
<td>50.8</td>
<td>0.000</td>
</tr>
<tr>
<td>Water</td>
<td>3.6</td>
<td>2.1</td>
<td>0.331</td>
</tr>
<tr>
<td>Breastmilk</td>
<td>6.3</td>
<td>15.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Others</td>
<td>21.2</td>
<td>31.5</td>
<td>0.012</td>
</tr>
<tr>
<td>Increased food intake during pregnancy</td>
<td>20.9</td>
<td>30.0</td>
<td>0.000</td>
</tr>
<tr>
<td>Fixed well for defecation</td>
<td>37.4</td>
<td>54.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Food consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bread</td>
<td>3.7</td>
<td>12.6</td>
<td>0.000</td>
</tr>
<tr>
<td>Potatoes</td>
<td>55.5</td>
<td>88.2</td>
<td>0.000</td>
</tr>
<tr>
<td>Egg</td>
<td>3.7</td>
<td>7.4</td>
<td>0.006</td>
</tr>
<tr>
<td>Milk</td>
<td>21.8</td>
<td>25.2</td>
<td>0.005</td>
</tr>
<tr>
<td>Stunting</td>
<td>43.0</td>
<td>32.0</td>
<td>0.015</td>
</tr>
<tr>
<td>Underweight</td>
<td>52.0</td>
<td>45.0</td>
<td>0.100</td>
</tr>
<tr>
<td>MUAC</td>
<td>5.4</td>
<td>4.5</td>
<td>0.696</td>
</tr>
</tbody>
</table>

In terms of the feasibility of the participatory approaches, the tools to ensure community participation have been very useful since there was great enthusiasm created among the community members initially. Gradually, the interest of the SHIs was declined as they were found to be more interested in the income generating activities and considered as an entry point to work with NGO’s and have access to external funds. Finding their assumption not true, the attendance of the volunteers (specially the leaders of the SHIs) started thinning but there were other people who came to continue the work since they found it interesting, beneficial and prestigious. Male participation was declining while female participation was increasing. With some facilitation by the female workers, a group of mothers got organized to come together and started saving a very nominal amount of money (about 6 cents a week). Later on, they were linked to the local office of the Women Affairs department under the Ministry of Social Welfare. Through the government’s regular programme, they got some skill training like sewing, handicraft, cow fattening, vaccinating chicken etc. These created an incentive to attend growth monitoring. Having found a new world, these mothers became very proactive not only in organizing the growth monitoring sessions, mobilizing the families to bring children for growth monitoring and convincing mothers to ensure
healthy practices at home. Even they were checking their neighbours for better practices.

The local self-help initiatives (most of them are dominated by males) were found to be more interested in income generating activities rather than voluntary work and gradually dropped out one by one. On the other hand, mother’s participation was increasing gradually and eventually they took over though they were not even invited in the early days of this project. Ultimately, all of the 13 self-help initiatives (male only) have dropped but 9 new mother groups have evolved who not only invest in income generating activities but also organize and manage about 30 nutrition centres. As a result, even 1 year after closure of SC-UK’s financial support, local partner CHESTA could continue their activities in the same project area with 3 staff members instead of 13 originally recruited. Their current salary is earned from a nursery garden, which was established during intervention period.

Discussion

It is clear from the study that there has been significant improvement in the overall malnutrition situation in the area although there had not been as such direct nutrition intervention like ‘supplementary food packets’ supplied from outside. That is what is generally understood by any large-scale nutrition intervention including Bangladesh Integrated Nutrition Project. However, though this project had wanted to challenge that idea that nutrition situation is not only dependent primarily on feeding practices but also more on ensuring food security, it did not undermine the importance of caring practices and falling sick. The project activities included problem solving analysis at household level to improve caring practices at home and growth monitoring sessions linked to public health services at community level. Though there was some effort to improve the socio-economic condition, it was affected by other external factors than project input. Though in-depth analysis had not been done to see the correlation between the economic variables and nutrition status confounding the caring practices variables, but with the available figures in this report, it was clearly evident that there has been significant improvement in the economic opportunities of the population in general. It becomes more obvious when we look into the current status of homestead land ownership, construction material of houses, expenditure for food, education and treatment etc.
It is true that the extent and level of improvement in nutrition and socio-economic status have been a bit unusual. Opportunities to spend money on food items and other household expenditure also increased substantially which all are difficult to believe an outcome of the project input. Rather, it was found under investigation that there was a racketeer group who were encouraging people to invest around Tk. 120% per year. Almost all but few people had invested money into this syndicate even selling their other properties and withdrawing money from the scheduled Banks. People’s income and expenditure was rising in rocket speed. The positive effect is evident on overall increase in asset and lifestyle such as having more TV, spending more on food, education etc. and the income were fattening they were growing bigger every day. The negative of such sudden boost economy is that it may collapse at any time and that happened with few months of closure of SC-UK’s direct input into the project. So, it would be interesting to see how the current achievement is sustained after the collapse and how much the behavioural change can sustain despite economic crisis.

Nevertheless, the authors would like to conclude saying that

- Appropriate tools are essential to ensure community participation in growth monitoring sessions, however;
- Active community participation takes a long time to achieve its desired outcome but ensures sustained involvement of the community;
- More than the direct nutrition input, other economic opportunities seemed to have played a major role in sharp improvement of nutrition situation in such a short time;
- Decision making process and opportunities to apply the knowledge was crucial in improving the nutrition situation.

References

INTRODUCING CHILD HEALTH: AN APPRAISAL OF THE ROLE OF RESEARCH

The Working Group on Women and Child Health: François Dabis¹, Marie Louise Newell², Joanna Orne-Gliemann¹, Freddy Perez¹, Anna Coutsoudis³, Valérian Leroy¹, Hoosen Coovadia³

Introduction

Children under 15 years of age represent 30% of the total world population and more in developing countries. Their survival remains one of the most important challenges worldwide. Child morbidity and mortality (in children under five years of age) can be substantially reduced through appropriate evidence-based and relatively simple health interventions such as infant immunization, oral re-hydration therapy for diarrhoeal diseases and other management strategies of common childhood illnesses. Research has helped to quantify the extent of child health problems, identified and evaluated strategies to improve child health and has provided evidence of the effectiveness of interventions. The reduction of child morbi-mortality related to measles and malaria would not have been possible without the knowledge acquired by research.

A large proportion of deaths in children is preventable. However, although child mortality has decreased by about 15% in relative terms since 1990, rates remain above 100 per 1000 live births in more than 40 countries (1). In 2000, it is estimated that 182 million children of pre-school age in developing countries suffer from growth retardation, particularly in a certain number of African countries where malnutrition rates tend to increase (2). Furthermore, it appears that the immunization coverage of the six standard antigens of the WHO Expanded Programme on Immunization has been declining over the past few years (3).

These facts call for a reappraisal of the role of research in the field of child health in developing countries. The aim of this paper is

¹ Institut de Santé Publique, d'Epidém iologie et de Développement (ISPED), Université Victor Segalen - Bordeaux 2, Bordeaux, France
² Centre for Paediatric Epidemiology and Biostatistics, Institute of Child Health, London, United Kingdom
³ Department of Paediatrics and Child Health, University of Natal, Durban, South Africa
to critically examine the present activity of institutions involved in child health in developing countries and particularly their research agendas. What is the adequacy between the investments in child research and the burden of child diseases? What are the assets and the weaknesses in the designing of research programmes and in the implementation of research results?

The degree of involvement of research actors influences the development of both knowledge and adequate and efficient tools to improve child health. The maximization of the potential of research is therefore fundamental to the sustainability of this progress and to the tackling of emerging child health problems in developing countries.

Method

We carried out a review of the literature published between January 1990 and June 2001. The Medline search strategy was based on the combination (Boolean operator AND) of “child” and “developing countries” and the following keywords (in alphabetical order): breast feeding, diarrhoeal diseases, health system, HIV infection, immunization, injuries, malaria, measles, mental health, mortality, opportunistic diseases, oral health, perinatal health, respiratory infections, sanitation and welfare. 4 701 references were identified, 488 selected based on their title and 137 on their content. Unpublished documents and reports issued by major institutions in the field of child health were identified and compiled. The purpose of this review of the literature was to appreciate the privileged or neglected areas of research and to understand some of the factors influencing the implementation of research results.

A survey was carried out via electronic mail from February to June 2001 addressing more than 90 informants. The target population consisted of worldwide institutions involved in the field of child health research: national entities such as medical research councils, universities, foundations, international-bilateral agencies, non-governmental organizations, etc. The objectives of this survey was to describe the current and past research activities undertaken in the field of child health research since 1990 and to highlight the challenges pertaining to an adequate research priority setting process and the implementation of research results.

Since no pre-established and exhaustive list of institutions involved in the field of child research in developing countries exists, the institutions were identified based on the results of the literature review, on the network of collaborating professionals of our Working Group and on further information collected via Internet. This cross-
sectional survey was undertaken through a standardized questionnaire, with open- and semi-open-ended questions. The survey data were entered in the Statistical Package for Social Science (SPSS) 9.0 programme. The 17 items of the questionnaire were coded according to the following groups of variables: the type of institutions targeted by the survey and having replied to the questionnaire; their geographical location; the profession of the participants to the survey; the geographical setting of their research activities; the type of research undertaken; the research area and approaches covered; the child health priorities according to the literature and to the survey; their criteria for setting research priorities; their perceived objectives of child health research; the role of research in improving child health; the child health policies and interventions designed based on the research findings; the areas where research was not implemented; the reasons for this non-implementation; and finally their perceived neglected fields of child health research.

Results

Magnitude of child morbidity and mortality: key findings of research during the last decade

The literature review enabled us to highlight the multiplicity of research strategies in the field of child health. Table 1 presents the different types of research susceptible of improving the health of children: each of these approaches needs to be considered together to understand and solve child health problems in developing countries.
Table 1: The different types of research in the area of child health and nutrition

<table>
<thead>
<tr>
<th>Type of research</th>
<th>Objective</th>
<th>Examples of needs or recent advances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive epidemiology and burden</td>
<td>To describe the magnitude of the problem, to identify the causes of child</td>
<td>The importance of child injuries and abuse is greatly</td>
</tr>
<tr>
<td>of disease</td>
<td>illness and death in different communities</td>
<td>unrecognized (4)</td>
</tr>
<tr>
<td>Aetiology and mechanisms</td>
<td>To understand the determinants of childhood diseases</td>
<td>S pneumonia causes 50% of all early infant meningitis (5)</td>
</tr>
<tr>
<td>Development of interventions</td>
<td>To design the most appropriate strategies to improve child health</td>
<td>Teaching mothers to promptly provide anti-malarials to</td>
</tr>
<tr>
<td>Impact and evaluation</td>
<td>To measure the effect of the implemented strategies and raise new</td>
<td>sick children at home decreases under five mortality (6)</td>
</tr>
<tr>
<td>Health systems</td>
<td>To increase the effectiveness of child health interventions and services</td>
<td>Improved quality of hospital care may lead to better</td>
</tr>
<tr>
<td>Policy</td>
<td>To analyze retrospectively and prospectively the scaling-up of child</td>
<td>Social marketing of insecticide-treated nets contributes</td>
</tr>
<tr>
<td></td>
<td>health and nutrition interventions</td>
<td>to improving child survival (9)</td>
</tr>
</tbody>
</table>

Among the ten most important conditions in the global burden of disease, five are major childhood diseases. Although the increasing importance of injuries and non-communicable diseases as causes of child mortality was highlighted in the 1990s (10), ill health associated with infectious diseases remains the most important direct cause of death and disability among children worldwide, especially in developing countries (11,12). Diarrhoeal and respiratory diseases are by far the most important causes of mortality in children under five years of age, accounting for an estimated eight million deaths in this age group globally (13) (Table 2).
### Table 2: World leading causes of Disability Adjusted Life Years (DALYs) in 1990

<table>
<thead>
<tr>
<th>All causes</th>
<th>Rank</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower respiratory infections *</td>
<td>1</td>
<td>8.2</td>
</tr>
<tr>
<td>Diarrhoeal diseases *</td>
<td>2</td>
<td>7.2</td>
</tr>
<tr>
<td>Perinatal conditions *</td>
<td>3</td>
<td>6.7</td>
</tr>
<tr>
<td>Unipolar major depression</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>5</td>
<td>3.4</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>6</td>
<td>2.8</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>7</td>
<td>2.8</td>
</tr>
<tr>
<td>Measles *</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td>Road-traffic accidents</td>
<td>9</td>
<td>2.5</td>
</tr>
<tr>
<td>Congenital abnormalities *</td>
<td>10</td>
<td>2.4</td>
</tr>
</tbody>
</table>

*primarily or exclusively childhood diseases

Source: WHO 1996 (13)

Five groups of explanatory factors associated with child mortality have been proposed: fertility behaviour, nutritional status of children and patterns of breast feeding, maternal and child health status and use of health services, environmental health and socio-economic factors (14). Although adequate feeding and good nutritional status have long been recognized to preserve children’s health, malnutrition in children remains a major public health problem in developing countries, where a third of all children under five years suffer from growth retardation (2). Results from several studies have highlighted the long-term consequences of mild and moderate forms of malnutrition (15), the benefits of appropriate breast feeding (16) and prevention of micronutrient deficiencies (17).

In a recently published pooled analysis of data from six countries in Africa and Latin America (18), the positive effects of breast feeding in reducing mortality in infants aged six to 11 months was confirmed. Zinc supplementation has been shown to improve the duration and severity of diarrhoeal episodes, and to prevent the incidence of diarrhoea, acute respiratory infections and malaria (19). Treatment protocols based on nutritional therapy using inexpensive, locally available foods, vitamin and mineral supplements and specific anti-microbial therapy have been shown to be successful for the short-term management of children with persistent diarrhoea (20). These research findings have subsequently been integrated in the WHO/UNICEF Integrated Management of Childhood Illnesses (IMCI) strategy. The IMCI strategy designed in 1996 to reduce childhood deaths, illnesses and disabilities and to improve the growth and development of children, had been implemented in more than 60 countries by 1999 (21).

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4 DALY’s are indicators of the time lived with a disability and the time lost to premature mortality.
Low birth weight is a strong predictor of growth and child survival, and has recently been shown to be associated with impaired immune function, persisting throughout childhood, and poor cognitive development in neonates and infants (22). In Bangladesh, where 50% of new-borns are of low birth weight, many infant deaths from pneumonia or respiratory infections and diarrhoea could be prevented if low birth weight were eliminated (22).

Infant and child health is also known to be related to the maternal environment. The Kangaroo Care method, which encourages skin to skin contact between mother (or father) and a premature new-born, was tested in Colombia (23) and in a pilot study in Zimbabwe (24). These studies confirmed the safety of this approach, which improved survival of pre-term babies.

The impact on child health of interactions between health personnel, health services and family care is increasingly a focus for operational research, integrated into broader reform of the health system at primary health care level (25). Research aimed at understanding behaviour and beliefs of health care providers has helped to clarify why health workers miss opportunities to immunize children (26), and to understand health provider performance.

The beneficial role of parental education was highlighted in Ethiopia (6), where the effect on under five mortality of teaching mothers to promptly provide anti-malarials to sick children at home was assessed in a randomized controlled trial. In the context of the WHO Roll Back Malaria initiative, the authors conclude that increased attention should be given to what family and community-based efforts can achieve when interventions are properly designed and applied in a receptive setting.

To ensure the provision of appropriate and relevant child health services in specific settings, the local environmental, social, and health resources need to be assessed. New initiatives illustrate the usefulness of Geographical Information Systems (GIS) to evaluate the effects of health care provision on the incidence of acute respiratory infections. In Bangladesh, the investigation of the spatial variation in health care resources and the association with adverse disease outcome, such as acute lower respiratory infection mortality, has enabled the planning of improved service delivery, which should in turn reduce child mortality (27). Environmental concerns have also allowed increased focus on factors at household level, in particular the consequences of indoor air pollution (28).
Survey findings

Profile of the participants

Out of 91 questionnaires sent, 48 questionnaires were received. Three questionnaires were rejected because too incomplete, therefore 45 questionnaires were analyzed, i.e. a response rate of 49.5% (Table 3). All types of institutions targeted are represented in the survey results. However, academic institutions represent more than one third of the survey population (40%) against 13.4% for international and bilateral agencies.

Table 3: Survey answering rate according to the type of institution - February-June 2001

<table>
<thead>
<tr>
<th>Type of institution</th>
<th>Questionnaires sent</th>
<th>Questionnaires received</th>
<th>Participation rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (a)</td>
<td>%</td>
<td>Number (b)</td>
</tr>
<tr>
<td>Academic institution</td>
<td>29</td>
<td>31,8</td>
<td>18</td>
</tr>
<tr>
<td>Public institute of research</td>
<td>14</td>
<td>15,4</td>
<td>8</td>
</tr>
<tr>
<td>National, governmental institution</td>
<td>12</td>
<td>13,2</td>
<td>5</td>
</tr>
<tr>
<td>Bilateral-international institution</td>
<td>19</td>
<td>20,9</td>
<td>6</td>
</tr>
<tr>
<td>NGO (Non-Governmental Organization)</td>
<td>10</td>
<td>11,0</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>7,7</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>100,0</td>
<td>45</td>
</tr>
</tbody>
</table>

The participation to the survey was more important for departments involved in mother and child health (26.7%), nutrition (15.5%) and public health in general (15.5 %). Most of the participants to the survey define themselves as epidemiologists (33.3%) or public health specialists (28.9%) and 18% of participants are clinicians. The 91 institutions targeted are located in 27 countries, over the five continents (Map 1). Almost all the institutions targeted in Latin America have answered to the questionnaire. The response rate of north-American institutions (31.6%) is the lowest with less than one third of the questionnaires returned. The geographical participation to the survey remains homogenous with 20 to 30% of institutions located in Europe, Africa and Asia, and 10 to 15% on the American continent.
Research activities

Table 4: Involvement of the participating institutions in different child health research areas and approaches, survey February-June 2001

<table>
<thead>
<tr>
<th>Research area</th>
<th>Academic institution n=18</th>
<th>Public research institute n=8</th>
<th>National, governmental institution n=5</th>
<th>Bilateral international institution n=6</th>
<th>NGO n=5</th>
<th>NGO n=3</th>
<th>Total n=45 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal Health</td>
<td>11</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>22 14.8</td>
</tr>
<tr>
<td>Malaria</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>7 15.5</td>
</tr>
<tr>
<td>Nutritional disorders</td>
<td>13</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>24 53.3</td>
</tr>
<tr>
<td>Micronutrients</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>21 46.6</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>8 17.7</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>9 20.0</td>
</tr>
<tr>
<td>Other infectious diseases</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>13 28.8</td>
</tr>
<tr>
<td>HIV</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>13 28.8</td>
</tr>
<tr>
<td>AIDS</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>8 17.7</td>
</tr>
<tr>
<td>Vulnerable children</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>17 37.7</td>
</tr>
<tr>
<td>Breast feeding</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12 26.6</td>
</tr>
<tr>
<td>Child growth and development</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>8 17.7</td>
</tr>
</tbody>
</table>

Total* 73 23 16 19 14 8 154
Table 4: Involvement of the participating institutions in different child health research areas and approaches, survey February-June 2001 (continued)

<table>
<thead>
<tr>
<th>Research area</th>
<th>Academic institution n=18</th>
<th>Public research institute n=8</th>
<th>National, governmental institution n=5</th>
<th>Bilateral international institution n=6</th>
<th>NGO n=5</th>
<th>Other n=3</th>
<th>Total n=45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community approach</td>
<td>12</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Algorithms</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Development of biomedical tools</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Health system</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>Descriptive epidemiology</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Operational research</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
<td><strong>20</strong></td>
<td><strong>9</strong></td>
<td><strong>25</strong></td>
<td><strong>14</strong></td>
<td><strong>7</strong></td>
<td><strong>113</strong></td>
</tr>
</tbody>
</table>

* Represents the total number of research areas and approaches mentioned by the institutions

1 indicates the coverage rate of research themes and approaches covered by the participating institutions

It appears that more than half the study population works in the field of child nutrition and micronutrient deficiencies (Table 4). The second most frequently mentioned area of research is perinatal health, highlighting the importance of pregnancy and the first years of life in relation to the growth and development of children. On the contrary, infectious diseases, especially malaria, diarrhoeal and respiratory diseases, as well as research on vulnerable children in developing countries appear less frequently in the activity of these institutions. The participating institutions mainly undertake research concerned with the understanding of local conditions: the community approach is mentioned in most cases as a privileged strategy of research. The study institutions also express their concern for describing and measuring child health, for improving the health systems but less for the evaluation of on-going interventions or policies.

The figures 1 and 2 illustrate the differences between the research undertaken by the institutions participating to the survey and the child health priorities in developing countries as stated in the literature. These figures show that perinatal health is the second most frequently mentioned area of research but the forth cause of mortality as stated in the literature (18%). On the contrary, the interest of the institutions participating to the survey for diarrhoeal and respiratory diseases and measles, well stated child health priorities, is less important.
Figure 1: Main causes of death in children under five in developing countries, 1995*

° According to ONUSIDA 2000

Figure 2: Research areas covered by the survey institutions - survey February-June 2001

For almost half of the institutions, the definition of child health research priorities abides to internal strategies and decisions (42.2%), i.e. the personal and/or professional interest of researchers and other specialists concerned with child health. The second factor guiding their research activities is the existence of a network, of communication and collaboration between the different actors of child health in developing countries.
The child health research activities undertaken by the participating institutions cover homogeneously Africa, Latin America and Asia where the majority of developing countries are located. The most frequently mentioned countries are, by alphabetical order, Bangladesh, Cameroon, Ecuador, Kenya, Peru, South Africa and Tanzania.

**Perceived role of research in improving child health**

The survey results show that the majority of the institutions consider research as a tool contributing to improve child health in developing countries. More than 60% of the academic institutions and public research institutes consider research as an instrument of health strategy, whereas international agencies are more likely to underline the operational potential of research.

The importance of the implementation of research results, through health interventions or policies, was estimated by the number of examples mentioned by the 45 participating institutions. More than 87% of the responses relate to less than four examples of research results applied, academic institutions mentioning the greatest number of examples. The field of research the most represented is nutrition, and specifically research into micronutrients (21.3%), nutritional interventions (16.8%) and breast feeding practices, and also the field of perinatal health (Table 5). On the contrary, less than 15% of the examples relate to the prevention of infectious diseases and the protection of vulnerable children.

**Table 5: Research areas implemented through health interventions or policies- survey February-June 2001**

<table>
<thead>
<tr>
<th>Research area</th>
<th>Policy</th>
<th>Intervention</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=47</td>
<td>n=42</td>
<td>n=89</td>
</tr>
<tr>
<td>Perinatal health</td>
<td>7</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Malaria</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Nutritional disorders</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Micronutrients</td>
<td>12</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Other infectious diseases</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Vulnerable children</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Breast feeding</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Child growth and development</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
<td>42</td>
<td>89</td>
</tr>
</tbody>
</table>

* Several areas may be mentioned by the participating institutions

† indicates the proportion of research results implemented in each area
A minority of institutions, 21 of 45, specified the amount of their financial resources allocated to child health research in developing countries. Furthermore, the scale of figures mentioned varies from 10 000 US$ to 600 000 000 US$ per year.

**Constraints in implementing research results**

Almost 50% of the survey institutions do not mention examples of research areas where the results have failed to be implemented. Among the responses analyzed, the category of nutritional interventions is the most frequently mentioned, so as the field of the development of biomedical tools and child care algorithms.

The main factor contributing to the implementation of research results is political support, stated in more than 25% of answers (Table 6). The survey institutions also mention the importance of conflicts of interest between different child health actors and the lack of financial support as some of the constraints to the implementation of research results.

**Table 6: Constraints in the implementation of research results survey February-June 2001**

<table>
<thead>
<tr>
<th>Reasons of non-implementation</th>
<th>Academic institution n=18</th>
<th>Public research institute n=8</th>
<th>National, governmental institution n=5</th>
<th>Bilateral, international agency n=6</th>
<th>NGO n=5</th>
<th>Other n=3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Among the answers</strong></td>
<td>n=29 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient funds available</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Lack of political support</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Results dissemination</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Lack of applicability</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Adequacy between selection</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Conflict of interest</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total responses</strong></td>
<td>31</td>
<td>12</td>
<td>5</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>66</td>
</tr>
</tbody>
</table>
Almost 80% of the institutions participating to the survey mention four neglected child health research areas and approaches, the majority of them (46.6%) mentioning two to three examples. The main areas of child health research considered as neglected are the field of vulnerable children, affected by the increasing incidence of injuries and non-communicable diseases, but also the field of nutritional disorders. Infectious diseases are rarely mentioned as neglected areas of child health research. In the category of the research approaches, the survey institutions state research gaps in the field of knowledge on local conditions and interventions, of community development and cultural determinants.

Discussion

Interpreting the survey findings

It appears in the literature that the six main causes of child mortality in developing countries are, by decreasing order, malnutrition, diarrhoeal diseases, respiratory diseases, perinatal health, HIV/AIDS (specifically in Africa), measles and malaria (Table 7). Although the survey results also underline the importance of preventing malnutrition, only one institution out of five is involved in research on respiratory diseases and malaria, and one out of 10 in the field of measles prevention.

Table 7: Confrontation of the literature review and the survey results on child health research in developing countries, January 1990-June 2001

<table>
<thead>
<tr>
<th>Research area</th>
<th>Literature Cause of death</th>
<th>Survey among key child health research actors Researched</th>
<th>Implemented</th>
<th>Neglected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnutrition</td>
<td>55.0 (1)</td>
<td>78.0 (1)</td>
<td>73.3 (1)</td>
<td>33.3 (1)</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>19.0 (2)</td>
<td>26.0 (4)</td>
<td>8.8 (5)</td>
<td>2.2 (5)</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>19.0 (2)</td>
<td>20.0 (5)</td>
<td>6.6 (7)</td>
<td>2.2 (5)</td>
</tr>
<tr>
<td>Perinatal health</td>
<td>18.0 (4)</td>
<td>51.0 (2)</td>
<td>30.3 (2)</td>
<td>17.7 (2)</td>
</tr>
<tr>
<td>HIV/AIDS°</td>
<td>10.0 (5) °</td>
<td>29.0 (3)</td>
<td>11.1 (3)</td>
<td>13.3 (3)</td>
</tr>
<tr>
<td>Measles</td>
<td>7.0 (6)</td>
<td>9.0 (7)</td>
<td>6.6 (7)</td>
<td>6.6 (4)</td>
</tr>
<tr>
<td>Malaria</td>
<td>5.0 (7)</td>
<td>20.0 (5)</td>
<td>8.8 (5)</td>
<td>2.2 (5)</td>
</tr>
</tbody>
</table>

( ) = rank

1 Main causes of death among children in developing countries (%):

° According to UNAIDS 2000

2 Proportion of institutions mentioning these research areas (%)
The literature review provided examples of successful research results, which are not implemented to the benefit of child health in developing countries. The 45 institutions indeed mention very few examples of research results applied through health interventions or policies. Furthermore, these institutions underline almost unanimously the difficulties related to the lack of political support and to the conflicts of interest between the different child health specialists, animated by diverging ambitions and ideologies.

The list of institutions contacted for this survey, characterized by their administrative profile and their geographical location, is not exhaustive but has targeted some of the key actors involved in the field of child health in developing countries. The 49.5% survey response rate is satisfactory. The sample of these actors involved in child health in developing countries is diverse enough in terms of profile and geographical location, and thus respects the representativeness expected when sending the questionnaire.

Nevertheless, it is also important to underline the fact that the context of the survey was the response to a demand from the Global Forum for Health Research. The latter has insisted on distinguishing child health and child nutrition, arguing that nutritionists are too often absent of the field of child health. Thus, the outline of certain items of the questionnaire, such as “Has your research on child health and nutrition led to the designing of national policies? Please give examples” may have induced an information bias, the institutions answering to the questionnaire specifically insisting on their research undertaken in the field of child nutrition. However, the importance of nutrition in the survey results also corresponds to the fact that malnutrition is a major factor associated to child morbidity and mortality and thus a public health priority that needs to be extensively researched.

Furthermore, the quality and exhaustiveness of the responses vary according to the questionnaires and participating institutions. Thus, the presentation of the data collected in terms of frequency of response increases the representation of the institutions that responded the most accurately. Similarly, the statement of their involvement in different child health research areas in developing countries depends both on the knowledge and the perception that these institutions have of their practice. For example, several institutions do not mention being involved in operational research whereas their reports of activities show the contrary.

In spite of the potential selection and information bias, this survey remains an original research tool that has highlighted essential points on the challenges of child health research in developing countries.
Perspectives

The review of the literature and the survey results highlight major advances in the field of child health since 1990, and underline the fundamental role of research in guiding this progress. They also show the need for an increased attention to neglected areas of research such as respiratory diseases and social vulnerability of children in developing countries.

To maximize the efficiency and responsiveness of child health and nutrition research, priority setting strategies have been designed by WHO, the Global Forum for Health Research (GFHR) and the Council for Health Research and Development (COHRED) (13,29,30). Each of these institutions recommends that the setting of research priorities needs to be based on evidence, to consider local ownership and partnership, to respect ethical issues and to address the interactions between child health and other sectors. The multiplicity of child health determinants calls for a multi-sectoral partnership, a combination of socio-economic policies and health interventions. Further research to inform such policy packages is therefore essential.

Research is often restricted to basic research activities. Thus for certain NGO’s or other institutions participating to the improvement of child health in developing countries, exploratory or operational missions are not viewed as research activities whereas these field experiences bring valuable knowledge necessary to the implementation of research. Similarly, the financing of studies on child health in developing countries is not considered as an involvement in the field of research even though financial decisions have a major influence on the orientation of research activities, on the credit and priority given to certain areas of research.

Even though the survey results do not allow rational conclusions on the expenses for child health research in developing countries and the literature lacks accurate estimates of global spending allocated for research on the main diseases or risk factors, the Global Forum for Health Research reports an imbalance between the disease burden and research and development investments for the world’s two biggest killer diseases. Although pneumonia and diarrhoeal diseases represent 11% of the global burden of diseases, and a much higher percentage in children, only an estimated 0.2% of the total amount spent on research and development is allocated to these diseases (29). Over two million children die every year from pneumonia and one million of pertussis and measles. However, acute respiratory illnesses receive only 0.15% of the research and development budget for health, which amounts to only US$ 0.51 per DALY (Disability Adjusted Life Years),...
compared to US$ 85 for HIV, US$ 13 for asthma, and US$ 0.32 for diarrhoeal disease (31). This gap between the resources and needs for health research is largely due to the neglect of child health research in developing countries and to the North-South inequalities in the means invested in research, the majority of funds originating from the North. The allocation of resources for health, and even more in the field of child health research has major consequences in terms of child morbidity and mortality, of socio-psychological prejudices for families and communities, of cost-effectiveness for health systems and nations.

This study confirms the need for child health research in developing countries to be based on evidence and thus on the development of national capacity for research. The adoption of Essential National Health Research (ENHR) strategies by national governments for example emphasizes country priorities, equity in health care and translation of research into policy and action. Research activities need to respond to local health needs: in the field of mother-to-child transmission of HIV for example, the ethical basis of the research project (32,33), the feasibility of the studies and the probability of implementation of the results (34) are conditioned by an adequacy with the demand from the beneficiaries of the research.

Finally, the results of both the survey and literature review highlight the fact that field research activities do not always directly respond to the needs of children living in developing countries. During a workshop organized in Geneva in April 2000 by the GFHR was mentioned a project of mapping on-going research activities world-wide, in order to understand on small and large scales the temporal evolution and spatial distribution of financial investments in the field of child health and to contribute to guide more precisely research agendas. The need for such baseline assessments also calls for increased communication and exchange of research initiatives, for the development of research partnerships between and among institutions in developed and developing countries.

Conclusion

Child health in developing countries is a major challenge for national and international actors engaged in improving world health. In particular, the institutions involved in research play a fundamental role in informing and guiding public health decision makers on the most pertinent strategies and interventions to implement in order to preserve and improve child health in developing countries. Strengthening national research capacities to
respond to local research needs and increasing ownership of research is fundamental for the implementation and sustainability of research findings at a population level. A dynamic interaction between researchers, policy-makers, advocacy groups and funding institutions is essential to ensure that child research priority setting is based on sound evidence and remains at the top of the international development agenda.

Acknowledgements

We thank E. Mouillet (ISPED) for assisting us with the literature review. Unpublished material and reports were made available by A. de Francisco (Global Forum for Health Research, Geneva) and O. Fontaine (WHO, Geneva). The Global Forum for Health Research commissioned us to prepare a report on the status of Child Health and Nutrition Research, which forms the basis of this review paper.

We also thank the participants in the Global Forum for Health Research Workshop, Geneva, Switzerland, 18-21 April 2001 for their valuable input in reviewing the background document used for this paper. Special thanks are due to the participants in the electronic survey.

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