

# School Health - Santé Scolaire - Salud Escolar

## Focusing Resources on Effective School Health: a *FRESH* Start to Enhancing the Quality and Equity of Education

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### School Health Situation Analyses

Chad, Mali, Mozambique, Tanzania, Uganda





# **School Health Situation Analyses**

## **Chad, Mali, Mozambique, Tanzania, Uganda**

**A Situation Analysis: A Participatory Approach to Building Programmes that Promote Health, Nutrition and Learning in Schools—*The Partnership for Child Development***

**A Survey of the Health of School Children in Chad—*Michael Beasley and Simon Booker***

**School Based Health and Nutrition: Preliminary Information for the Development of a Program in Mali—*Michael Beasley, Penelope Bender, Don Bundy, and Robert Prouty***

**School Health, Hygiene and Nutrition: Mali, Mission Report—*Martine Lugat***

**Pre-identification of a School Health and Nutrition Component in the Education Sector in Mozambique—*Annegrete Liljestrand***

**A Situation Analysis of the Health of School Children and Current School Health and Nutrition Programs in Tanzania—*Matthew Jukes and Damaris Ngorosho***

**Preliminary Situation Analysis: School Health in Uganda—*Seung-hee F. Lee***



## **Foreword**

School health and nutrition programs provide one of the most cost-effective ways to promote the education, health, and nutrition of school children, particularly if they are developed as part of community partnerships and delivered by the education sector. Such programs have an additional importance today because they provide one of the most important ways to reach adolescents and the broader community with messages about HIV/AIDS prevention.

School-based health and nutrition programs are not a new concept, but historically such programs have often been inefficient and retrogressive, usually favoring the better off children in urban centers. A new efficient and progressive approach to school health has now been developed by a partnership of agencies, including UNESCO, WHO, UNICEF, WFP, and the World Bank. This framework for action seeks to Focus Resources on Effective School Health through the FRESH concerted action program and was launched by its sponsoring agencies at the World Education Forum in Dakar, April 2000.

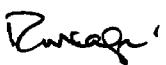
The four “pillars” of the FRESH framework are: (i) health-related school policies; (ii) provision of sanitation and clean water; (iii) a skills-based approach to health, hygiene, and nutrition education; and (iv) school-based health and nutrition services.

The FRESH framework is intended to assist governments in selecting interventions that respond to the health and nutrition needs of school children, and that are feasible to implement in even the most resource-poor schools. This approach depends on carefully identifying the most important problems for which solutions are available. The cost effectiveness of this approach is dependent on careful selection and targeting of interventions.

The essential first step for governments in preparing or updating their school health programs is to conduct a situation analysis which can identify the major health and nutrition challenges that are relevant to education, and which can characterize the operational opportunities to respond.

Developing a cost-effective approach to such analysis was an important part of the process of creating the FRESH framework and is described in some detail in the first section “Guidelines” of the present document. But the major aim of this document is to provide some examples of how countries have in practice implemented situation analyses, and what their conclusions were. The analyses presented here were conducted by different people in a wide range of countries in Africa with very different health and education systems. Nevertheless, it is apparent that there are some common conclusions and a remarkable consensus around the need for the four major pillars of the FRESH framework.

Finally, we thank the Government of Norway for providing financial support through the Norwegian Education Trust Fund for the preparation of this report.



Ruth Kagia  
Education Director  
Human Development Network  
World Bank



## **Introduction**

This book is intended to help the development of school health and nutrition programs that are cost effective and which respond to local needs. It is aimed at those who are about to develop a national school health program and who would like to learn from the experiences of others.

The first part of the book offers some guidelines on how to conduct a Situation Analysis. The situation analyses aim to show: What are the challenges to the health and nutrition of school children in a specific country? What is already being done to improve the health and nutrition of schoolchildren at the district or national level? and What opportunities there are for strengthening this response. These guidelines were developed by a consortium of agencies using a remarkably participatory process that has resulted in a deceptively simple approach that has proven effective in practice. The history of the development of the approach is described in the introduction to the guidelines, which are the joint product of collaboration among UNICEF, USAID (Africa Bureau), WHO, the Edna McConnell Clark Foundation, the Partnership for Child Development, and the World Bank.

The book then presents a series of actual Situation Analyses conducted in very different countries in Francophone, Lusaphone, and Anglophone areas of Sub-Saharan Africa. These reports help illustrate the real challenges and opportunities that exist for school health and nutrition programming. The examples all arise from the preparation of World Bank Projects, but were conducted by very different teams, even though they used a consistent framework for analysis. The reports describe some countries with relatively extensive data sources, but also describe those for which information on the health of schoolchildren is almost completely lacking. They illustrate that, even among the low-income countries of Africa, very different approaches—and levels of effort—may be required to achieve a sufficient level of understanding to plan an effective school health program.

The guidelines and the reports are the products of real experience. As a result the situation analyses are often incomplete—perhaps because it would be too expensive to find out more—and often flawed—perhaps because real infrastructures fall short of ideal systems. There has been no attempt to fill in gaps or remove inconsistencies. The situation analyses are presented here not as examples of perfect studies, but rather to share real world experiences.

This compilation was assembled by Don Bundy, Seung-hee Frances Lee, and Robert Prouty working with the Africa Region and Human Development Network of the World Bank.



## **GUIDELINES**



# **A Situation Analysis**

## **A Participatory Approach to Building Programmes that Promote Health, Nutrition and Learning in Schools**



World Health  
Organisation



The Edna McConnell  
Clark Foundation



U.S. AGENCY FOR INTERNATIONAL  
DEVELOPMENT BUREAU FOR AFRICA,  
OFFICE OF SUSTAINABLE  
DEVELOPMENT, EDUCATION TEAM

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The Partnership for Child Development (PCD) was established in 1992 to help co-ordinate global efforts to assess the developmental burden of ill health and poor nutrition at school age. It brings together a consortium of countries, donor organisations and centres of academic excellence to design and test strategies to improve the health and education of school-age children.

The Partnership has international agency support from UNDP, WHO, UNICEF, The World Bank and British DFID, and is sustained through support from participating governments, the Rockefeller, Edna McConnell Clark and James S McDonnell Foundations and the Wellcome Trust.

The Scientific Coordinating Centre for the Partnership is based at:  
The Department of Infectious Disease Epidemiology, Imperial College School of Medicine,  
St. Mary's Campus, Norfolk Place, London, W2 1PG, UK.  
Tel/Fax: +44 (0) 207 262 7912  
Web: <http://www.schoolsandhealth.org>

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- Kiswahili translation by Ms. Damaris Ngorosho MAKWAMI project, Bagamoyo, Tanzania.
- Spanish translation by Sergio Meresman, World Bank, Washington, DC, USA. \* Extracto de “Escuelas Promotoras de Salud: Modelo y Guía para la Acción” de la Serie de Desarrollo y Fortalecimiento de los Sistemas Locales de Salud, HSP/SILOS-36, Organización Panamericana de la Salud, Washington, DC, 1996.

## About this Document

The development of this Situation Analysis document is an example of inter-agency collaboration in response to a common challenge. This challenge emerged at the end of the 1980s when it became apparent that child survival programmes were becoming increasingly successful and that an increasing proportion of children – more than 90% on average, worldwide – were surviving to reach school age. At the same time there was an acceleration of efforts to provide education for all, and to work towards achieving universal access to basic education. A new vision for the 1990s was established: more children of school age, and more in school, than at any time in human history.

But who were these ‘new’ schoolchildren? Overwhelmingly, they would be the children of the poor. The children who now survive, but who would not have done so previously. The children in urban slums and un-reached rural areas who have never before had the chance to attend school. The children who carry with them problems of ill health and disability which may prevent them from attending school and which compromise their ability to learn even if they reach the classroom. Ill health at school age may prevent these children taking full advantage of their only opportunity for formal education.

It was against this background that efforts were initiated to develop programmes to improve the health and nutrition of school age children. And it was immediately recognised that the essential first step was to provide education and health planners at all levels with the tools for defining the existing situation in schools and school children, and the tools to plan for positive change.

The UNICEF School Based Initiative was created as a means of bringing together government and civil society representatives interested in the issue of school health. These discussions, which were held in Thailand, Jamaica and Cameroon, were strengthened by a Technical Support Group of specialists in school health from the major agencies – UNICEF, WHO and UNAIDS (then GPA) – as well as from the Partnership for Child Development, a multi-agency initiative, specifically created to focus on the technical aspects of school health issues. It was after the meeting in Yaounde, Cameroon that a consensus version of the Situation Analysis document was distributed.

The Situation Analysis was circulated within agencies, for comment. It was published in full, and very widely disseminated, as an Appendix to a World Bank special report on school health and nutrition programming. This created interest and response, which resulted in further modification. It was posted on the website of the Partnership for Child Development ([www.ceid.ox.ac.uk/child](http://www.ceid.ox.ac.uk/child)), where versions in six languages are available for review (Update: [www.schoolsandhealth.org](http://www.schoolsandhealth.org)).

The Edna McConnell Clark Foundation, an important philanthropic supporter of school health programmes in Africa, provided the resources for a field test of the document. This was coordinated by the WHO/TDR Task Force for Healthy School Children, and was implemented in Ghana, Tanzania, Botswana, Uganda, Cameroon and Zimbabwe. The tool was implemented by District level health and education teams, and at the National level. It proved robust, whether implemented by inter-sectoral teams that had rarely worked together previously, or by teams that had been specifically created to promote inter-sectoral activity, such as the Ghana Partnership for Child Development and Ushirikiano wa Kumwendeleza Mtoto (UKUMTA) in Tanzania.

As the present volume indicates, the Situation Analysis document has been translated into many languages and used to guide the development of school health programmes in many places. The process of translation and dissemination is another example of interagency cooperation, with USAID (Africa Bureau), the World Bank, the Pan American Health Organisation, Save the Children (USA) and the Partnership for Child Development all contributing.

Despite its colourful history, the Situation Analysis remains simple. Superficially, it is no more than guidelines, lists and *aides-memoires* for investigating what is already done for the health of school children within a country at the district or national level, and what opportunities there are for strengthening this. But it is in the implementation of the analysis that its strength becomes apparent: it requires all the partners to think across sectors, and this simple, participatory process builds partnerships. Implementing the analysis not only provides information but also lays the foundation for the inter-sectoral partnerships that are essential for creating a school health and nutrition programme that successfully improves learning in schools.

**Don Bundy**  
Partnership  
for Child  
Development  
World Bank

**Bruce Dick**  
UNICEF

**David Evans**  
WHO

**Bradford Strickland**  
USAID

**Joseph Cook**  
Edna McConnell  
Clark Foundation

## **Information required for a situation analysis of the health and nutrition of school-age children**

### **Introduction**

The goal of the situation analysis described in this document is to guide the design and evaluation of school-based health and nutrition programmes. A situation analysis can be detailed and comprehensive, but the most appropriate initial approach is usually a low-cost, rapid survey that supplies the preliminary answers necessary for intelligent efforts to develop or strengthen school nutrition and health programmes. The approach outlined in this document is not exhaustive; there are likely to be particular sources and types of information that are relevant to a given country or situation.

A situation analysis following the approach outlined here gathers information sufficient for a report that:

- Identifies the priority health and nutrition problems of school age children;
- Quantifies school participation (enrolment, absenteeism, repetition, and drop-out rates) and identifies the major causes of absence from school;
- Identifies practicable, sustainable interventions that are likely to most improve children's health, nutrition, school attendance and educational achievement;
- Identifies major gaps in, and problems with, existing school nutrition and health services, and suggests remedies;
- Informs efforts to monitor and evaluate school nutrition and health services;
- Identifies issues requiring further investigation.

The process of information gathering also provides an opportunity to establish partnerships among school and health personnel, school-age children and other relevant groups and organisations. Such relationships are an immense help to programmes furthering school health and nutrition services. The information for a situation analysis may come from an assessment of existing information, interviews with key informants, focus group discussions, and other assessment techniques. Information gathering is discussed below in relation to distinct issues; in practice however, each assessment, interview or discussion pursues these issues simultaneously.

Further technical assessment will be required before any new programme can arise from the initial assessment report. In particular, more refined targeting of interventions will undoubtedly require more specific analyses, including biomedical surveys. Given the context of advocacy in which any situation analysis is written, it should present its information in an interesting and accessible manner and use a variety of data to give depth and emphasis. For example, a comparison of the share of household income spent on smoking and alcohol with the share spent on the health care of school-age children might add force to the picture drawn by the report.

## **Identifying Priority Health and Nutrition Problems**

### **THE INFORMATION REQUIRED**

#### **Causes of morbidity and mortality**

Information on the major causes of death and illness is fundamental to the selection of priority interventions. The data must also include health problems that begin in childhood and adolescence but that manifest themselves later in life - HIV infection, for example. Besides the causes of disease and death, information should ideally include the age and sex of subjects, their location and its geography (e.g. whether urban or rural, wet or dry) and the season during which they became ill. Interventions designed subsequent to the situation analysis can then be carefully targeted. In reality many of these details may not be available but it is important to build as full a picture as possible.

#### **Mortality and morbidity trends**

Information about whether a health or nutrition problem is increasing or decreasing over time aids the identification of future priorities.

#### **The extent of short-term hunger and malnutrition**

The analysis should pay special attention to nutrition problems and hunger that may not show up in health data.

#### **Changes in patterns of health-related behaviours**

The analysis should determine how changes in risk-related behaviours such as substance abuse, smoking and early and unsafe sex affect factors such as levels of violence, unwanted pregnancies and dropout from school.

#### **Other impairments inhibiting school performance**

The analysis should gather information on the prevalence of sensory deficits (hearing or vision impairments) and other handicaps among school-age children.

#### **The role of social and cultural factors as health determinants**

The relationships of identified health and nutrition problems to current societal values and norms are important for the design of programmes, especially with regard to the health of girls.

## **LOCATING THE INFORMATION**

#### **Reports and surveys in the international and national literature**

Technical support groups (for example, UNICEF and WHO country offices, World Bank resident mission) might review the international literature while local research institutes concentrate on the national literature. Sources of information outside the education and health sectors can be useful; for example, the criminal justice area may provide information relevant to adolescent behaviour patterns. Information is particularly required about:

- Mortality by cause;
- Micro-nutrient deficiency (vitamin A, iron, iodine), anthropometrics (height-for-age and weight-for-height measures), short-term hunger and other measures of nutritional status;
- Parasitic infection, including malaria and worm infection;
- Early pregnancy and reproductive health (sexually transmitted diseases, HIV/AIDS, reproductive tract infections, menstrual health);

- Respiratory infections, including tuberculosis and recurrent or intermittent fevers, including those from malaria and acute respiratory infection (ARI);
- Immunizable diseases (polio, tetanus, typhoid);
- Hearing and sight impairment, skin infections, dental problems;
- Chronic disability and mental illness;
- Sexual exploitation and abuse, violence, accidents and dependency on alcohol, tobacco and drugs.

#### **Routine mortality and morbidity statistics from local sources**

Data on the causes of admission and outpatient attendance at hospitals, clinics and other local medical centres provide information on utilisation but are inevitably biased by the catchment area and user group. Data from casualty centres may be the only source of information on violence and accidents.

#### **Interviews**

Potential informants include staff of ministries of health and education, non-governmental organisations (NGOs) focused on health and young people, relevant university faculties, health professionals and officials in the criminal justice system. The interviews, perhaps based on the conditions listed above, would seek to link the causes of ill health to national patterns.

#### **Questionnaires and focus group discussions**

These can be used to determine the perceptions of teachers, health workers, parents and students about major health and nutrition problems. Such questionnaires and discussions may clarify whether the community perception of the causation and distribution of health problems differs from the empirical observation. Knowledge of perceptions is essential to the subsequent development of appropriate health education messages. Discussions may also permit assessment of psychosocial factors, such as stress, particularly in the broader social context described by the standard UNICEF situation analysis (for example, unemployment and social disruption). The questionnaires and focus groups could also provide background information on patterns of sexual abuse, which could usefully be supplemented indirectly by age-specific measures of sexually transmitted diseases.

## **How Best to Use Schools to Reach the School-Age Group**

### **THE INFORMATION REQUIRED**

#### **The size of the school-age population, enrolment and dropout rates, and the proportion of children repeating grades**

This information identifies predominant patterns in education sector indicators. The data should cover the primary and secondary levels and variations by age or grade, sex, region, and degree of urbanisation.

#### **Absenteeism rates**

The analysis must gather information – by season and day of the week in addition to age, sex, degree of urbanisation, and region - on children who are formally enrolled in school but who regularly fail to attend. In some regions, seasons of increased agricultural activity have high rates of absenteeism and would be particularly inappropriate times for school-based delivery of interventions. Likewise, extensive absenteeism on a regular market day would be revealed by statistics on absenteeism by day of the week.

#### **Causes of non-enrollment and absenteeism**

The primary causes of absenteeism may not be among the major health issues, but identifying ways to reduce absenteeism is critical if children are to receive schooling and school-based health and nutrition interventions.

#### **The potential role of non-formal education**

Information on the extent of the non-formal education sector may reveal further opportunities to deliver nutrition and health education and services. The non-formal sector may be important for particular groups such as girls or adolescents that may be underserved by the formal sector.

#### **Laws and policies relevant to school-age children**

Information should cover laws on sexual harassment by teachers, laws restricting access to tobacco and alcohol, policies on sex education, and policies on allowing school-age girls who become pregnant to return to school.

#### **Current community spending on the education, nutrition and health of school-age children**

This information will indicate the potential for school nutrition and health programmes to achieve sustainability through community contributions and other community approaches to cost recovery.

### **LOCATING THE INFORMATION**

#### **Reports and surveys in the international and national literature**

The national literature, particularly from the ministry of education, is likely to be the most valuable.

#### **Statistics assembled by regional and district education services**

Most of the assembled data are collated from summaries sent in from local levels, but their analysis may require special expertise such as that in local education research institutions.

## **Interviews**

See the section on interviews above.

## **Sharing collected data**

Summaries of collected data can be shared with teachers, other workers in the health and education sectors and older students who can say whether the data identify the important determinants of enrolment and absenteeism. Special efforts will be required to interview young people who are not enrolled, or who are frequently absent, and their parents. Such interviews may reveal information about current practices and perceptions of laws and policies.

## **Assessing the Capacity to Promote and Implement Programmes**

### **THE INFORMATION REQUIRED**

#### **Existing nutrition and health services for school-age children**

Of interest are not only existing school programmes but also the general health services intended for school-age children. Information on the availability of material and financial resources will be particularly important in assessing local resource capacity and response. Basic topics include:

- The specific responsibilities of the health and education sectors for school nutrition and health education and services;
- National and regional policies relating to school nutrition and health programmes - their relevance and the extent to which they are open for review;
- The structure, components, and coverage of any existing school nutrition and health programmes, including customary health screening and first aid programmes;
- Current approaches to health education, including family life and reproductive health education, and other nutrition- and health-related activities such as school health clubs;
- Current use of primary health care facilities by the school-age group, including use of reproductive health facilities, and referrals between schools and the primary health care system;
- The extent to which school-age children use private health services and traditional healers;
- The content, coverage, effectiveness and cost of school feeding programmes and school gardens;
- Information on school canteens and local food vendors who serve schools;
- Information on school water supply and sanitary and waste disposal facilities;
- The contribution of NGOs and intergovernmental organisations to school programmes;
- The community's contribution to schools and health including the provision of clean water and good sanitation facilities, school feeding, and other nutrition and health services;
- Current levels of investment by government or other agencies in the health and nutrition of school-age children;
- Pre-school and special education provision.

#### **Plans for extending services for school-age children**

It is necessary to project the availability of resources and the technical and institutional capacity for extending services using:

- Interviews of key individuals and institutions with relevant expertise and interests; and,
- Assessments of the relative strengths and weaknesses of lead agencies and other participating organisations in school health and nutrition programmes.

#### **The capacity of the education sector to help deliver nutrition and health education and services**

An emphasis on cost data will help in the assessment of programme affordability and sustainability. Required information includes:

- The number and distribution of primary and secondary schools and teachers, compared with the number of clinics and health workers;
- The content of existing nutrition and health education in schools, including focus, methods, materials and an overview of relevant curricula being implemented or explored;
- The capacity of teacher training institutions to provide training in nutrition and health, including the frequency and coverage of in-service training for teachers;

- The contribution of religious organisations and other NGOs to the education sector and the capacity of such organisations to help deliver nutrition and health education and services;
- The contribution of intergovernmental organisations to school nutrition and health programmes;
- The willingness and capacity of government departments, agencies in the education sector and communities to invest in the nutrition and health education of the school-age population;
- The willingness and capacity of the school environment to play an active role in delivering nutrition and health education and services;
- The capacities of the school environment to support health promotion, including the availability of clean water and facilities for menstruating girls at school.

UNICEF situation analyses of the education and health sectors might contain information on some of these items or may provide a basis for comparison. For example, one informative comparison would be that between the quality of water and sanitation in the school and the quality of water and sanitation in the household and the community.

#### **Current availability of resources**

These resources will come from the many sectors relevant to health and education (governmental, non-governmental, and intergovernmental) and even from the children themselves and the wider community. Information is also necessary on the financial and economic cost of proposed interventions.

#### **Availability of resources from other entities**

These entities include sports and religious organisations, social welfare groups and the media. Contributions from such sources may be particularly important in ensuring sustainability of school health and nutrition programmes.

#### **LOCATING THE INFORMATION**

Much relevant information will have been collected from the sources in assessments of existing resources and capabilities. Additional sources are detailed in particular sections above.

## **Further information and references**

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**CHAD**



# **A Survey of the Health of School Children in Chad**

**November 2000**

**Michael Beasley**

**Simon Brooker**

Department of Infectious Disease Epidemiology

Imperial College School of Medicine

St Mary's Campus, Norfolk Place, London WG 1PG

Prepared for

Mourad Ezzine, AFTH2

Don Bundy, HDNED

Seung-hee Lee, AFTH2



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## **1. Introduction**

The Government of Chad has identified health and nutrition as major constraints on the quality of learning and educational achievement of children in Chad. Good health and nutrition are essential prerequisites for an effective education. Some health conditions of the greatest importance for education can be dealt with most cost effectively by schools themselves. These conditions have been identified by FRESH (Focusing Resources on Effective School Health) through joint action by the World Health Organization, UNICEF, UNESCO and the World Bank. The FRESH guidelines to identify the most cost effective interventions of greatest relevance to education were used in designing the present study.

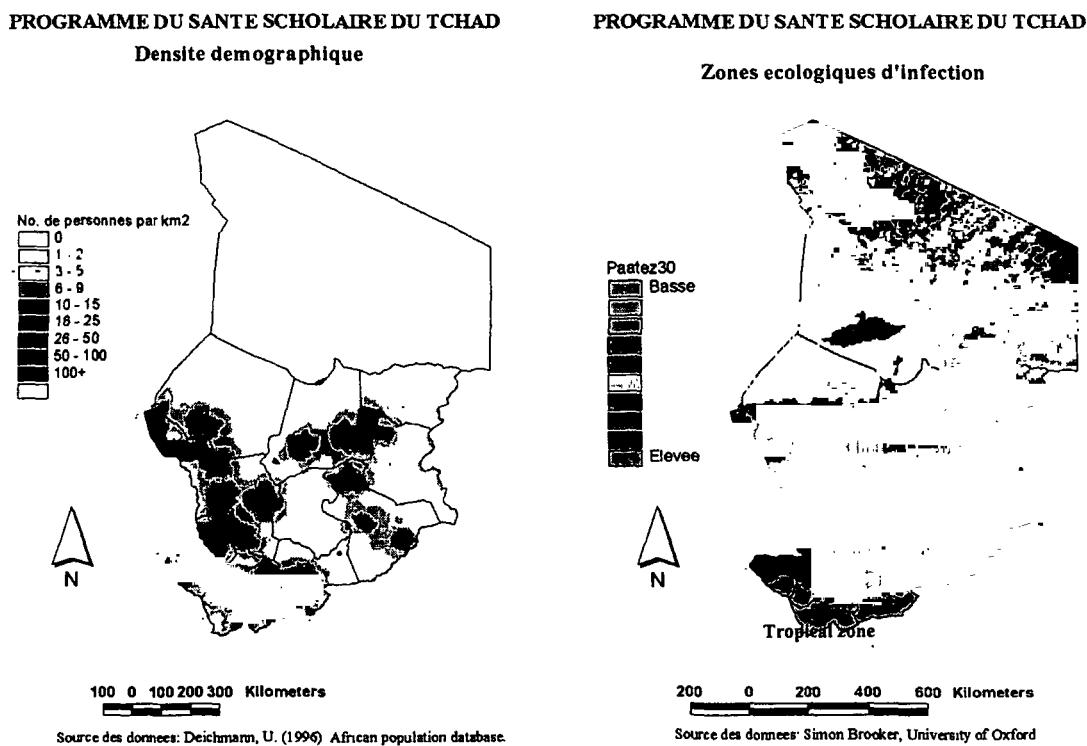
Each school health program must be tailored to its specific context. Before a program can be designed, a clear understanding is needed of the prevalence and distribution of the problems to be addressed within a country. This can be accomplished through studies of existent literature and through field studies. Previous studies of malnutrition and infection with parasitic helminths in Chad have for the most part been rare, limited and extremely dated (Appendix A). For this reason, it was deemed necessary to conduct the first country wide survey of the health of Chad's school children. The survey focused on children's infection with parasitic helminths and experience of anaemia, iodine deficiency and protein energy malnutrition.

## **2. Methods**

The study was conducted by the School Health Commission of Chad assisted by a consultant team. A mobile health team visited more than 1000 children surveyed across representative ecological zones chosen to reflect the epidemiology of health and nutrition in Chad. The zones were identified using geographic information systems which provided data on altitude, rainfall, vegetation and temperature derived from remotely sensed satellite sensors and interpolated climate surfaces.

20 schools across different ecological zones of the country were surveyed. 50 children in each school were examined for parasitic infection and for nutritional status using standard techniques. A questionnaire was administrated to each school's head teacher to investigate school enrolment, infrastructure and sanitation. (See Appendices for further details of sampling and diagnostic procedures, and list of schools surveyed).

**Figure 1. Map of Chad showing geographical distribution of population density and ecological zones.**



## Results

The prevalence of infection and undernutrition among Chadian schoolchildren in the different ecological zones are shown in Tables 1 and 2 (see Figure 1 for map of ecological zones).

**Table 1. The prevalence of infection and mean egg counts of helminths by ecological zone in Chadian schoolchildren**

| Ecological zone | S. haematobium (bilharzia) |             |             | Hookworm    |             |            | Both <sup>1</sup> % infected |
|-----------------|----------------------------|-------------|-------------|-------------|-------------|------------|------------------------------|
|                 | N                          | % infected  | Mean epg    | N           | % infected  | Mean epg   |                              |
| N'Djamena       | 152                        | 2.6         | 4.9         | 142         | 9.2         | 72         | 0.7                          |
| Sahélienne      | 258                        | 39.1        | 27.5        | 258         | 3.1         | 4          | 1.6                          |
| Soudanien       | 511                        | 23.2        | 10.9        | 506         | 47.8        | 256        | 12.2                         |
| Tropical        | 99                         | 6.1         | 0.3         | 97          | 67.0        | 408        | 5.3                          |
| <b>Total</b>    | <b>1020</b>                | <b>22.5</b> | <b>13.2</b> | <b>1003</b> | <b>32.7</b> | <b>180</b> | <b>7.1</b>                   |

<sup>1</sup> 994 children provided both a stool and urine sample

**Table 2. The prevalence of undernutrition and anaemia by ecological zone in Chadian schoolchildren**

| Ecological zone | N           | % Anaemia<br>(Hb <110<br>g/L) | Mean Hb    | % Goitre    | % Stunted<br>(HAZ<br><-2 sd) | %<br>Underweight<br>(WAZ<br><-2 sd) | % Wasted<br>(WHZ<br><-2 sd) <sup>1</sup> | %<br><15    | BMI |
|-----------------|-------------|-------------------------------|------------|-------------|------------------------------|-------------------------------------|--|-------------|-----|
| N'Djamena       | 151         | 12.0                          | 121        | 11.8        | 10.7                         | 18.0                                | 7.1                                      | 51.3        |     |
| Sahélienne      | 258         | 35.3                          | 114        | 44.6        | 20.2                         | 28.7                                | 10.4                                     | 70.9        |     |
| Soudanien       | 514         | 23.4                          | 118        | 17.0        | 19.9                         | 10.5                                | 0.5                                      | 22.8        |     |
| Tropical        | 101         | 26.7                          | 117        | 17.8        | 20.8                         | 13.9                                | 0.0                                      | 12.9        |     |
| <b>Total</b>    | <b>1024</b> | <b>25.1</b>                   | <b>117</b> | <b>23.3</b> | <b>18.7</b>                  | <b>16.5</b>                         | <b>4.6</b>                               | <b>38.2</b> |     |

<sup>1</sup> sample size=392. Only calculated for below age 10 years for girls and 11.5 years for boys.

The prevalence of *S. haematobium* and hookworm was found to vary considerably between schools, with *S. haematobium* being most prevalent in the North and in the Logone and Chari basins in the west of the country and lowest in the south near the Central African Republic (Figure 1). By contrast, hookworm was most prevalent in the south of the country.

Stunting, a measure of chronic or long term malnutrition was similar throughout the Sahelian, Sudanian and Tropical zones (approximately 20%) and was much less in N'djamena. Children living in N'djamena and the Sahel tended to be thinner (lower weight for age z score, weight for height z score and BMI) than children living in the South of the country. The prevalence of anaemia varied from 12% to 35% being highest in the Sahelian zone and lowest in N'djamena. Goitre rates have ranged from 7-18% in the South and N'djamena to 33-45% in the Sahel and Mayo Kebbi.

Analysis by gender revealed several significant differences: overall, boys were more stunted, underweight, anaemic and infected while girls had more goitre. Detailed breakdown of the results by school and by age and gender are provided in Appendices C & D.

**Table 3. Mean anthropometric, haemoglobin and parasitological measurements and indices in boys and girls in Chad, and the percentage of children classified as stunted, underweight and anaemic**

|  | Male         | Female       | Significance difference |
|--|--------------|--------------|-------------------------|
|  | Mean (s.d)   | Mean (s.d)   |                         |
| Body mass index                        | 15.6 (1.5)   | 15.5 (1.7)   | 0.562                   |
| Height-for-age z-score                 | -1.15 (1.11) | -0.84 (1.20) | <0.001                  |
| Weight-for-age z-score                 | -1.31 (0.82) | -1.08 (0.82) | <0.001                  |
| Weight-for-height z-score <sup>a</sup> | -0.71 (0.77) | -0.81 (0.78) | 0.228                   |
| Haemoglobin (g/L) <sup>b</sup>         | 116 (15)     | 120 (14)     | <0.001                  |
|  | %            | %            |                         |
| Stunted                                | 20.8         | 15.4         | 0.03                    |
| Underweight                            | 19.0         | 12.6         | 0.007                   |
| Wasted <sup>a</sup>                    | 4.6          | 4.5          | 0.959                   |
| Body Mass Index <15                    | 36.6         | 40.9         | 0.163                   |
| Anaemic (Hb <110 g/l)                  | 29.0         | 18.9         | <0.001                  |
| Goitre                                 | 21.3         | 26.4         | 0.05                    |
| Hookworm                               | 35.3         | 28.5         | 0.03                    |
| <i>S. haematobium</i>                  | 28.8         | 12.7         | <0.001                  |
| <i>S. haematobium</i> and hookworm     | 10.0         | 2.6          | <0.001                  |

<sup>a</sup> Only calculated for below age 10 years for girls and 11.5 years for boys.

#### *School enrolment and infrastructure*

Only three schools (15%) had female teachers (Table 4). The pupil - teacher ratio ranged 1:45 - 1:125.

Most schools were of poor infrastructure, many of the rural schools had thatched buildings. One school had no classrooms at all.

Only seven schools (35%) had potable water and seven (35%) had a latrine. Only 3 of those schools with a latrine had separate facilities for boys and girls. None of the schools (0%) had a first aid kit. 6 of the 7 urban schools (86%) had latrines and potable water. Only 1 of the 13 rural school (8%) did so.

**Table 4. Demographic characteristics of schools.**

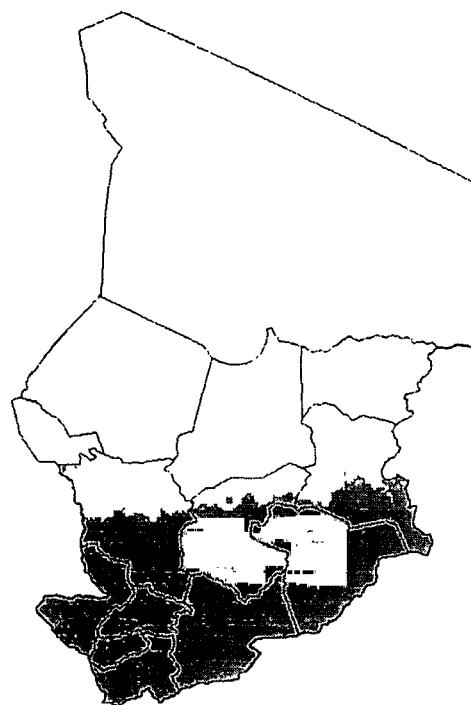
| School                   | Total enrolment |      |       | Pupil sex ratio | No. teachers |      |        | Teachers sex ratio | Pupil: teacher ratio |
|--------------------------|-----------------|------|-------|-----------------|--------------|------|--------|--------------------|----------------------|
|                          | Total           | Boys | Girls |                 | Total        | Male | Female |                    |                      |
| <b>N'Djamena</b>         | 1140            | 570  | 570   | 1               | 16           | 11   | 5      | 2.2                | 71.3                 |
| Klemat - no data         |                 |      |       |                 |              |      |        |                    |                      |
| Leprosserie A            | 796             | 400  | 396   | 1.01            | 8            | 4    | 4      | 1.0                | 99.5                 |
| Hillé Leclerc            | 4000            | 2875 | 1125  | 2.56            | 32           | 25   | 7      | 3.6                | 125.0                |
| <b>Saheline zone</b>     |                 |      |       |                 |              |      |        |                    |                      |
| Boulalaty                | 158             | 110  | 48    | 2.29            | 3            | 3    | 0      |                    | 52.7                 |
| Soulemanary              | 122             | 60   | 62    | 0.97            | 2            | 2    | 0      |                    | 61.0                 |
| Djimezé                  | 83              | 53   | 30    | 1.77            | 1            | 1    | 0      |                    | 83.0                 |
| Michegue                 | 79              | 44   | 35    | 1.26            | 1            | 1    | 0      |                    | 79.0                 |
| Bokoro - Ecole du Centre | 882             | 562  | 320   | 1.76            | 9            | 9    | 0      |                    | 98.0                 |
| <b>Soudanien zone</b>    |                 |      |       |                 |              |      |        |                    |                      |
| Bongor Sieke             | 307             | 249  | 58    | 4.29            | 3            | 3    | 0      |                    | 102.3                |
| Guizede                  | 311             | 191  | 120   | 1.59            | 3            | 3    | 0      |                    | 103.7                |
| Gourneida                | 231             | 134  | 97    | 1.38            | 3            | 3    | 0      |                    | 77.0                 |
| Bellevue A               | 1580            | 715  | 815   | 0.88            | 16           | 5    | 11     | 0.5                | 98.8                 |
| Rinkou                   | 200             | 105  | 95    | 1.11            | 3            | 3    | 0      |                    | 66.7                 |
| Betéré                   | 182             | 132  | 50    | 2.64            | 4            | 4    | 0      |                    | 45.5                 |
| Karkaye                  | 405             | 286  | 119   | 2.40            | 5            | 5    | 0      |                    | 81.0                 |
| Nahor                    | 1140            | 570  | 570   | 1               | 16           | 11   | 5      | 2.2                | 71.3                 |
| Nang-Ndah                | 208             | 132  | 76    | 1.74            | 4            | 4    | 0      |                    | 52.0                 |
| Sanguele                 | 316             | 206  | 110   | 1.87            | 4            | 4    | 0      |                    | 79.0                 |
| <b>Tropical zone</b>     |                 |      |       |                 |              |      |        |                    |                      |
| Goré – Ecole du centre   | 729             | 461  | 268   | 1.72            | 10           | 10   | 0      |                    | 72.9                 |
| Kondjala                 | 209             | 154  | 55    | 2.80            | 4            | 4    | 0      |                    | 52.3                 |

### **3. Recommendations**

#### ***3.1 Geohelminth infection***

The World Health Organization recommends mass treatment with albendazole in schools where the prevalence of infection is equal to or greater than 50%. The infection was found extensively in the Sudanian (48%) and Tropical (67%) suggesting that in these areas, school based mass treatment for hookworm should occur (Figure 2). The prevalence of hookworm in the Sahelian zone (3%) and N'djamena (9%) indicate that mass treatment would not be merited in these areas.

**Figure 2. Areas in which school based mass treatment for hookworm is required**



No cases of infection with *Ascaris lumbricoides* or *Trichuris trichiura* were found in Chad, presumably due to thermal exclusion.

**All children living in the tropical and Sudanian zones should receive mass treatment with albendazole. Mass treatment with albendazole should not be given to children living in N'djamena or the Sahelian zones. In these areas there may be specific needs not identified by the present survey.**

#### ***3.2 Schistosome infection (bilharzia)***

Infection with *Schistosoma haematobium* (urinary bilharzia) was common in the Sahelian zone (39%) and in the prefecture of Mayo Kebbi (57%). Within these areas, infection with was found

to be highly focal with prevalence rates varying from 7% to 64% in the Sahel and from 37% to 72% in Mayo Kebbi. The prevalence of infection in N'djamena and in the south of the country was consistently much lower (0 – 18%).

As for hookworm, the World Health Organization suggests that mass treatment for *S. haematobium* with praziquantel is recommended where the prevalence of infection is equal to or greater than 50%. Given the focal nature of *S. haematobium* infection, other countries have identified schools in need of mass based treatment through the use of questionnaires designed to estimate local prevalence of blood in children's urine ('red' urine) as a proxy for infection. The use, during the survey, of a French translation of a questionnaire used in Tanzania was considered (See Appendix E). It quickly became apparent that the clinical picture of *S. haematobium* infection in Chad differed markedly to that of other countries: in Chad no 'red' urines were observed and the mean intensity of infection was consistently lower than in other countries. Other studies have found similar results. Under such circumstances the questionnaire as used elsewhere would be of little use. A further consideration was that the area in which *S. haematobium* was most prevalent, the Sahelian zone, is arabic speaking. No one has as yet delivered an Arabic version of the questionnaire. Concern was expressed that even were such a version available, while many Chadian teachers could speak Arabic, it was by no means certain that they would be able to read Arabic.

It is clear that a need for mass school based treatment of *S. haematobium* exists in the Sahelian and in the prefecture of Mayo Kebbi (Figure 3). The implementation of such treatment could be targeted were there an effective questionnaire similar to that used elsewhere but tailored to the Chadian context. Development of a questionnaire would demand considerable design and field testing in order to comprehend the clinical context of *S. haematobium* infection in Chad, the linguistic concerns outlined above and perhaps also cultural issues such as asking adolescent Muslim girls about the presence of blood in their urine. A possible alternative rapid assessment technique for urinary schistosomiasis in Chad could be to use dipsticks designed to indicate the presence of blood in urine. Such a technique would of course need to be evaluated.

The dosage of praziquantel is calculated according to weight. To purchase weighing scales for all schools where mass treatment should occur would be costly. Fortunately, a simplified method of dosage according to height has been developed. The height and weight data collected during the study mean that such a height based method can now be implemented in Chad.

During the survey, only seven infections with *Schistosoma mansoni* (intestinal bilharzia) were identified. It is probable that the true prevalence of infection with this parasite was considerably higher but where infection intensities are low it is difficult to detect the parasite from a single stool sample. Fortunately, all cases of *S. mansoni* found occurred in the same areas as infection with *S. haematobium* meaning that mass treatment for urinary bilharzia would also achieve control of intestinal bilharzia.

**Figure 3. Areas in which school based mass treatment for bilharzia is required**



**Treatment with praziquantel for bilharzia is required in the Sahelian zone and in the prefecture of Mayo Kebbi. Treatment is not required elsewhere in the Sudanian zone or in the tropical zone. A method for dosage according to height in Chad is available as a result of this study.**

**An effective schistosomiasis questionnaire for Chad needs to be developed in order to make treatment more cost effective.**

**Of the whole country, a combined albendazole/praziquantel treatment strategy is required only in Mayo Kebbi.**

### ***3.3 Anthropometry***

The prevalence of malnutrition in Chad is comparable to other African countries and while a cause for concern is marginally better than in some. Stunting, a measure of chronic or long term malnutrition was similar throughout the Sahelian, Sudanian and Tropical zones (approximately 20%) and was much less in N'djamena. Children living in N'djamena and the Sahel tended to be thinner (lower weight for age z score, weight for height z score and BMI) than children living in

the South of the country. The results underline the comparatively disadvantaged nutrition of children living in the Sahelian zone.

Clearly, greater availability of food to children is desirable to combat malnutrition. School feeding has high opportunity costs and may not be the most effective means of providing improved nutritional intake. It is therefore recommended that some piloting of community feeding approaches should occur in the North of Chad.

A limitation of the results was that throughout the country, the parent enrolling a child to the survey was almost always the father. Many fathers were uncertain about the age of their child. This does mean that age related indices are likely to contain a considerable margin of error.

**School based nutrition education is needed in all areas of the country. Especial priority should be given to provision of education in the Sahelian zone. Piloting of community feeding approaches should also occur in this zone.**

#### **3.4 Anaemia**

The prevalence of anaemia varied from 12% to 35% being highest in the Sahelian zone and lowest in N'djamena. School based weekly iron supplementation, shown to be beneficial in other countries, could be used as a means of reducing the prevalence of anaemia amongst Chad's school children.

**Weekly school based iron supplementation should be implemented in all areas of the country. Especial priority should be given to provision of supplementation in the Sahelian zone.**

#### **3.5 Iodine deficiency**

An extensive survey of iodine deficiency in Chad was conducted in 1993 which found that the prevalence of goitre ranged from 60% to 70% across the country with the exception of N'djamena where the prevalence was 25%. Although the our sample and that of the 1993 survey differed considerably (7-12 year olds vs 10-20 year olds; school based vs community based), the results do indicate that the situation has marginally improved and that more regional variation now exists than formerly. While goitre rates have fallen considerably in the South and N'djamena (7% to 18%), rates remain elevated in the Sahel (45%) and also in Mayo Kebbi (33%).

The results underline the need for continuing public health education concerning the consumption of iodised salt, particularly in the Sahel and in Mayo Kebbi. It would seem that the presidential decree concerning the sale of iodised salt has improved matters though anecdotal observation suggests that non iodised salt continues to be sold in the country's markets.

Analysis of the iodine content of urine samples collected during the study is in process and results are awaited in order confirm the clinical observations described above.

**School based nutrition education and promotion of the use of iodised salt should occur throughout Chad. All schools should be provided with UNICEF kits to test whether salt used in children's homes is iodised. Especial priority should be given to promotion of these measures in the Sahelian zone.**

### ***3.6 School infrastructure***

The FRESH initiative has underlined the need to improve access to clean water and sanitation in all schools. It is clear that enormous efforts need to be made to improve the situation in the schools of Chad. Sanitation and supplies of clean water were non existent in most schools visited and inadequate in all. Parents attending all meetings concerning the survey expressed concern at the lack of sanitation and clean water in schools.

**All schools should be equipped with school latrines for boys, girls and teachers and with supplies of clean water. It is impossible to achieve healthy behaviour in the absence of a healthy environment. Schools should provide an exemplary hygienic environment.**

### **Overall recommendations**

- Deworming for hookworm (albendazole) should occur in the Tropical and Sudanian zones.
- Treatment for schistosomiasis (praziquantel) should occur in the Sahelian zone and in Mayo Kebbi.
- Careful investigation is needed to determine how schistosomiasis treatment can be targetted at foci of infection.
- School based nutrition education is needed in all areas of the country. Especial priority should be given to provision of education in the Sahelian zone.
- Weekly iron supplementation should be employed as a nationwide strategy in schools across Chad to alleviate anaemia. Especial priority should be given to provision of supplementation in the Sahelian zone.
- School based nutrition education and promotion of the use of iodised salt should occur throughout Chad. All schools should be provided with UNICEF kits to test whether salt used in children's homes is iodised. Especial priority should be given to promotion of these measures in the Sahelian zone.
- All schools should be equipped with school latrines for boys, girls and teachers and with supplies of clean water. Schools should provide an exemplary hygienic environment.
- Addendum: The diet in Chad is one which tends to vitamin A deficiency as is born out by mothers' responses to questions concerning nightblindness in infants during the DHS demographic survey of Chad (1996-1997). If infants show signs of vitamin A deficiency, it is highly probable that deficiency also exists amongst school aged children. On this basis the case for inclusion of Vitamin A supplementation of school aged children along with other interventions to be delivered to this group is justified. Education about consumption of foods rich in vitamin A should be included with other health education interventions.

## **Appendix A: A Review of Relevant Literature on the Health of School Age Children Living in Chad**

### ***A.1 Infection with Parasitic Helminths***

Buck *et al.*, (1970) surveyed five villages in different regions and found prevalences of infection with parasitic helminths as given in the table below. Whilst the prevalences given are for all age groups, as expected, the study found that school aged children were more commonly infected with helminths than other age groups.

| Préfecture (village)           | N   | %Sh  | %Sm  | %Hw  | %Al | %Tt |
|--------------------------------|-----|------|------|------|-----|-----|
| Chari Baguirmi (Djimtilo)      | 368 | 26   | 0.8  | 0.9  | 0   | 0   |
| Logone oriental (Ouli Bangala) | 381 | 6.2  | 43.7 | 9.4  | 0   | 0.5 |
| Moyen Chari (Ourai)            | 352 | 31.4 | 0.9  | 13.2 | 0   | 0   |
| Moyen Chari (Boum Kebir)       | 356 | 0.3  | 1.0  | 6.1  | 0   | 0   |
| Biltine (Faya Largeau)         | 191 | 1.8  | 0    | 0    | 0   | 0.5 |

Sh = *Schistosoma haematobium*

Sm= *Schistosoma mansoni*

Hw= Hookworm

Al= *Ascaris lumbricoides*

Tt= *Trichuris trichiura*

Gigase *et al.* (1988) surveyed 195 9-19 year old children living in three different villages for infection with *S. haematobium*. In Moyen Kebbi prevalences of infection were 87% in Tikem and 57% in Yoné. In Ouddaï, the prevalence of infection was 19%. All children surveyed were boys except in Tikem where some girls were included in the sample.

Massenet *et al.* (1995) investigated infection with *S. haematobium* amongst 532 6-15 year old pupils at 9 schools in periurban N'djamena and nearby villages. The overall prevalence was 11.8% (range 2-24%). Rural children were more commonly infected than urban children.

### ***A.2 Iron Deficiency***

A study of pregnant women in N'djamena conducted in 1991 found that of 660 women, 50% had a haemoglobin level less than 11g/dl and 1.7% with a level less than 7 g/dl. Malaria was found to be a contributory factor in 78% of cases of anaemia (Ministères d'agriculture et de la santé, 1997).

A country wide nutritional survey of people aged 5 years and more has in the year 2000 been conducted by the Centre National de Technologie Alimentaire. The survey has included measurements of haemoglobin and the results of its analysis are awaited.

### ***A.3 Iodine Deficiency***

A national survey of iodine deficiency disorders (IDD) conducted amongst 1171 10-20 year old people living in 60 locations across the country found the overall prevalence of goitre in the

country to be 63% (Wyss *et al*, 1996). The prevalence was greater in the ‘Sudan’ zone (Mayo Kebbi, Tandjile, Logone occidental, Logone oriental, Moyen Chari) (70%) than in the ‘Sahel’ zone (Chari Baguirmi, Batha, Biltine, Ouddaï, Guéra) (64%). The prevalence of goitre in N’djamena was much lower (25%). Girls were more likely to have goitre than boys. In the Sudan zone, 33% of children had a urinary iodine level less than 20 $\mu$ g/l indicating severe iodine deficiency. In the Sahel zone this statistic applied to 8% of children and in N’djamena 1% of children. The prevalence of cretinism ranged from 0-1.2%, surprisingly being more prevalent in the Sahel zone. High levels of thiocyanate anions (medians ranging from 21-27 mg/l across areas) suggesting that diet plays a role in iodine deficiency. Few households were found to use iodised salt – only 30% in the Sudan zone, 27% in the Sahel and 50% in N’djamena.

The prevalence of goitre by prefecture was as follows:

| Préfecture        | N   | % prevalence |
|-------------------|-----|--------------|
| Batha             | 60  | 68           |
| Biltine           | 40  | 83           |
| Chari Baguirmi    | 184 | 59           |
| Guéra             | 60  | 58           |
| Ouddaï            | 141 | 65           |
| Logone occidental | 100 | 74           |
| Logone oriental   | 80  | 70           |
| Mayo Kebbi        | 182 | 63           |
| Moyen Chari       | 141 | 74           |
| Salamat           | -   | -            |
| Tandjilé          | 61  | 70           |

In response to the survey, a national campaign to encourage Chadians to use iodised salt was adopted. Mme Baronga, Nutrition adviser at UNICEF N’djamena estimated that use iodised salt now stands at about 67%.

#### *A.4 Nutritional Intake*

Food production per head of population decreased in Chad during the period 1961-1994 (Minsitères d’agriculture & santé publique, 1997). Calorific intake varies considerably across the country:

|                           | Kcal | % median world intake<br>(2700 kcal) |
|---------------------------|------|--------------------------------------|
| Chari Baguirmi (rural)    | 2855 | +6                                   |
| N'Djamena                 | 2373 | -12                                  |
| Logone occidental (rural) | 2420 | -10                                  |
| Moundou                   | 2099 | -22                                  |
| Moyen Chari (rural)       | 1788 | -34                                  |
| Sahr                      | 1734 | -36                                  |
| Ouddaï (rural)            | 2901 | +7                                   |
| Abeché                    | 3280 | +22                                  |

Studies in N'djamena in 1987, 1989 and 1995 found that acute malnutrition in children aged under five varied between 8.5 and 10%. Acute malnutrition varies by area. For example in Kanem in 1994, acute malnutrition in under fives was 17.6%.

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## **Appendix B: Methods and materials**

### ***B.1 Sampling strategy***

A nationwide study of school health was across Chad. The country was divided into 4 different zones: N'djamena, Sahelian, Sudanese Sahel and Tropical selected to represent different ecological areas of the country based on differences in altitude, rainfall, vegetation and temperature. This information was available from remotely sensed (RS) satellite-sensor imagery, which can provide indirect estimates of land surface temperature, rainfall and vegetation amount, or from interpolation between fixed meteorological site records that can produce spatially continuous climate surfaces. The RS data included Land Surface Temperature (LST) and the Normalised Difference Vegetation Index (NDVI) from the Pathfinder land data recorded by the Advanced Very High Resolution Radiometer (AVHRR) on-board the National Oceanic and Atmospheric Administration's (NOAA) polar-orbiting meteorological satellites. Interpolated rainfall surfaces and an interpolated digital elevation model (DEM) of Africa were also used. These data were subsequently used to define ecological zones that reflect variation in ecological conditions and are known to be important for the distribution of helminth infections and under nutrition.

The number of schools sampled in each zone reflected the proportion of the national population in each zone. For example, 10% of Chad's population lives in the Tropical zone, consequently 2 schools were sampled there. In all 13 rural and 7 urban schools were visited (Table B.1). Sub prefectures were chosen for sampling on the basis of population density and ease of road access. The precise geographical location of schools was collected in the field using a non-differential global positioning system (GPS) (Magellan Systems Corp., San Dimas, CA.). In each school, a target of 25 boys and 25 girls in class 3 were selected. If there were insufficient pupils in Class 3 additional pupils were sampled from Class 4. Participation was voluntary and was approved by both the school committee and individual parents.

**Table 5.** List of schools selected for the study

| <b>Zone</b> | <b>Préfecture</b> | <b>Sous-Préfecture</b> | <b>Nom d'Ecole</b>       | <b>Environ</b> |
|-------------|-------------------|------------------------|--------------------------|----------------|
| N'Djamena   | N'Djamena         | N'Djamena Nord         | Klemat A                 | Urbain         |
|             | N'Djamena         | N'Djamena Sud          | La Leprosserie A         | Urbain         |
|             | N'Djamena         | N'Djamena Est          | Hillé Leclerc            | Urbain         |
| Sahélienne  | Chari Baguirmi    | Massakory              | Boulalaty                | Rural          |
|             | Chari Baguirmi    | Massakory              | Soulemanary              | Rural          |
|             | Chari Baguirmi    | Bokoro                 | Djimezé                  | Rural          |
|             | Chari Baguirmi    | Bokoro                 | Michegue                 | Rural          |
|             | Chari Baguirmi    | Bokoro                 | Bokoro - Ecole du Centre | Urbain         |
| Soudanien   | Mayo Kebbi        | Bongor                 | Bongor Sieke             | Rural          |
|             | Mayo Kebbi        | Bongor                 | Guizede                  | Rural          |
|             | Mayo Kebbi        | Bongor                 | Gournaida                | Rural          |
|             | Logone Occidental | Moundou                | Bellevue A               | Urbain         |
|             | Logone Occidental | Krim Krim              | Rinkou                   | Rural          |
|             | Logone Occidental | Krim Krim              | Betéré                   | Rural          |
|             | Logone Occidental | Krim Krim              | Karkaye                  | Rural          |
|             | Moyen Chari       | Sahr                   | Nahor                    | Urbain         |
|             | Moyen Chari       | Djoli                  | Nang-Ndah                | Rural          |

|          |   |                       |  |                          |
|----------|---|-----------------------|--|--------------------------|
| Tropical | Moyen Chari<br>Logone Oriental<br>Logone Oriental | Djoli<br>Goré<br>Goré | Sanguele<br>Goré – Ecole du centre<br>Kondjala | Rural<br>Urbain<br>Rural |
|----------|---|-----------------------|--|--------------------------|

### B.2 Parasitology

A faecal sample was collected from each child and examined within 30 minutes using the Kato-Katz method. The concentration of eggs of hookworm was estimated in eggs per gram faeces (epg). 10mls of a urine specimen collected from each child was filtered through a 13mm diameter polycarbonate membrane with a 12µm pore size (Millipore Ltd) and the concentration of the eggs of *S. haematobium* was expressed as eggs/10ml of urine. In accordance with WHO recommendations that mass treatment be provided when prevalence exceeds 50%, in schools where the prevalence of infection exceeded this threshold, all children studied were treated with albendazole 500 mg; where the prevalence of infection was less than 50% only children found infected were treated. Individual children found infected with schistosomiasis were given a single dose of praziquantel at a dosage of 40mg/kg.

### B.3 Nutritional assessment

Finger prick blood was used to estimate the haemoglobin concentration using a portable photometer (Hemocue Ltd, Sheffield, UK). Anaemia was defined as a haemoglobin concentration of < 110 g/L (Stoltzfus *et al.*, 1997a). The height and weight of each child was measured to the nearest 0.1 cm and 0.1 kg respectively using a stadiometer ('Leicester' Model, Child Growth Foundation, UK) and electronic scales (Soehnle, CMS Weighing Equipment, UK). Z-scores of height-for-age and weight-for-age were calculated using NCHS reference values using Anthro software (Sullivan & Gorstein, 1990). Children with a z-score of height-for-age or weight-for-age of < -2 S.D. below the NCHS median were defined as stunted or underweight respectively. Children underwent a brief standardized clinical examination to assess presence and size of goitre, which was graded: grade 0, no goitre; grade 1, not visible but palpable; grade 2, thyroid visible. No grade 2 was seen during the survey and therefore all goitre is taken as not visible but palpable.

### B.4 Analysis

Chi-square tests and Student t-tests were used to test significant differences in infection prevalences and means between the sexes.

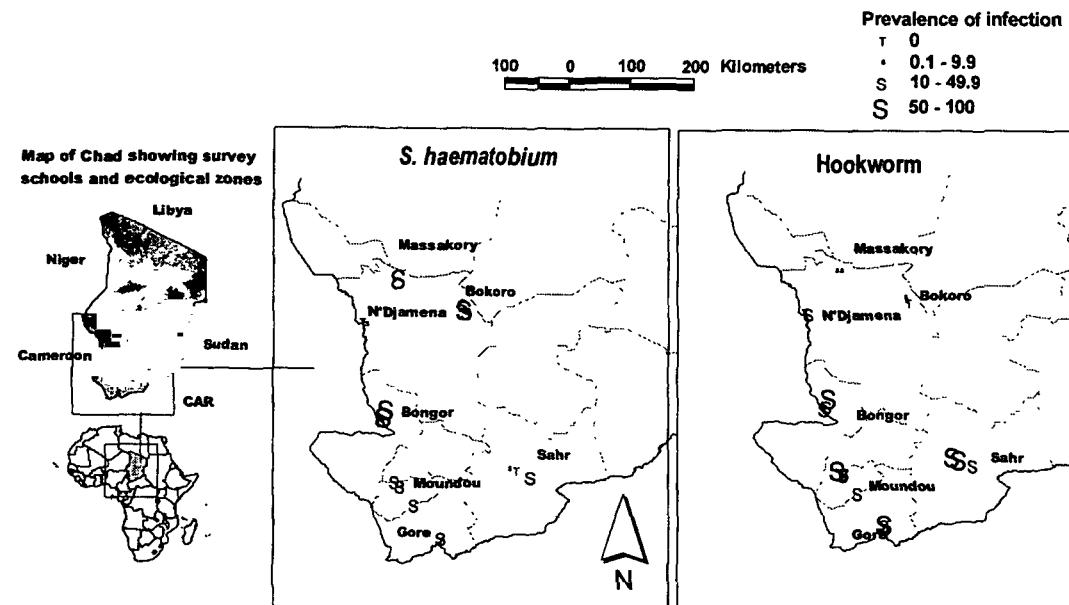


## Appendix C: Results by School and Sous-préfectorates

**Table 6.** The prevalence of infection and mean concentration of the eggs of hookworm and *Schistosoma haematobium* in Primary schoolchildren in Chad by school and sous-préfectorates

| School                   | Préfecture        | Sous-Préfecture | Schistosoma |            |          | Hookworm  |            |          | Both species<br>% infected |
|--------------------------|-------------------|-----------------|-------------|------------|----------|-----------|------------|----------|----------------------------|
|                          |                   |                 | No. exam.   | % infected | Mean epg | No. exam. | % infected | Mean epg |                            |
| <b>N'Djamena zone</b>    |                   |                 |             |            |          |           |            |          |                            |
| Kleimat A                | N'Djamena Nord    | Urbain          | 52          | 3.8        | 14.5     | 42        | 0.0        | 0.0      | 0.0                        |
| La Leprosserie A         | N'Djamena Sud     | Urbain          | 50          | 2.0        | 0.0      | 50        | 26.0       | 208      | 2.0                        |
| Hillé Leclerc            | N'Djamena Est     | Urbain          | 50          | 0.0        | <0.1     | 50        | 0.0        | 0.0      | 0.0                        |
| <b>Sahélienne zone</b>   |                   |                 |             |            |          |           |            |          |                            |
| Boulalaty                | Chari Baguirmi    | Massakory       | Rural       | 52         | 63.5     | 36.9      | 52         | 3.8      | 3                          |
| Soulemanary              | Chari Baguirmi    | Massakory       | Rural       | 55         | 7.3      | 0.2       | 55         | 3.6      | 1                          |
|                          |                   | Massakory total |             | 107        | 34.6     | 18.1      | 107        | 3.7      | 2                          |
| Djimezé                  | Chari Baguirmi    | Bokoro          | Rural       | 50         | 28.0     | 8.6       | 50         | 2.0      | 0.0                        |
| Michegue                 | Chari Baguirmi    | Bokoro          | Rural       | 51         | 39.2     | 22.4      | 51         | 0.0      | 0.0                        |
| Bokoro - Ecole du Centre | Chari Baguirmi    | Bokoro          | Urbain      | 50         | 60.0     | 72.0      | 50         | 6.0      | 12                         |
|                          |                   | Bokoro total    |             | 151        | 42.4     | 34.3      | 151        | 2.6      | 4                          |
|                          |                   |                 |             |            |          |           |            |          | 1.3                        |
| <b>Soudanien zone</b>    |                   |                 |             |            |          |           |            |          |                            |
| Bongor Sieke             | Mayo Kebbi        | Bongor          | Rural       | 51         | 37.3     | 4.6       | 51         | 23.5     | 136                        |
| Guizede                  | Mayo Kebbi        | Bongor          | Rural       | 50         | 72.0     | 46.8      | 50         | 48.0     | 108                        |
| Gournaida                | Mayo Kebbi        | Bongor          | Rural       | 50         | 62.0     | 26.2      | 50         | 66.0     | 336                        |
|                          |                   | Bongor total    |             | 151        | 57.0     | 25.7      | 151        | 47.5     | 196                        |
|                          |                   |                 |             |            |          |           |            |          | 29.1                       |
| Bellevue A               | Logone Occidental | Moundou         | Urbain      | 53         | 18.9     | 2.4       | 53         | 30.2     | 298                        |
| Rinkou                   | Logone Occidental | Krim Krim       | Rural       | 51         | 2.0      | 0.2       | 51         | 13.7     | 28                         |
| Betéré                   | Logone Occidental | Krim Krim       | Rural       | 50         | 18.0     | 11.4      | 50         | 80.0     | 694                        |
| Karkaye                  | Logone Occidental | Krim Krim       | Rural       | 54         | 11.1     | 11.5      | 54         | 44.4     | 190                        |
|                          |                   |                 |             |            |          |           |            |          | 3.7                        |

|                        |                 |             |            |     |      |      |     |      |     |     |
|------------------------|-----------------|-------------|------------|-----|------|------|-----|------|-----|-----|
|                        |                 | Krim        | Krim total | 205 | 10.3 | 7.7  | 205 | 45.8 | 300 | 7.1 |
| Nahor a Sahr           | Moyen Chari     | Sahr        | Urbain     | 49  | 10.2 | 7.1  | 44  | 20.9 | 64  | 0.0 |
| Nang-Ndah              | Moyen Chari     | Djoli       | Rural      | 52  | 0.0  | 0    | 52  | 73.1 | 324 | 0.0 |
| Sanguele               | Moyen Chari     | Djoli       | Rural      | 51  | 2.0  | 0.1  | 51  | 76.5 | 344 | 0.0 |
|                        |                 | Djoli total |            | 103 | 1.0  | 0.06 | 103 | 74.5 | 332 | 0.0 |
| <b>Tropical zone</b>   |                 |             |            |     |      |      |     |      |     |     |
| Goré – Ecole du centre | Logone Oriental | Goré        | Urbain     | 49  | 2.0  | 0.1  | 50  | 48.0 | 288 | 2.1 |
| Kondjala               | Logone Oriental | Goré        | Rural      | 50  | 10.0 | 0.4  | 47  | 87.2 | 531 | 8.5 |
|                        |                 | Goré total  |            | 99  | 6.1  | 0.3  | 97  | 67.0 | 408 | 8.5 |

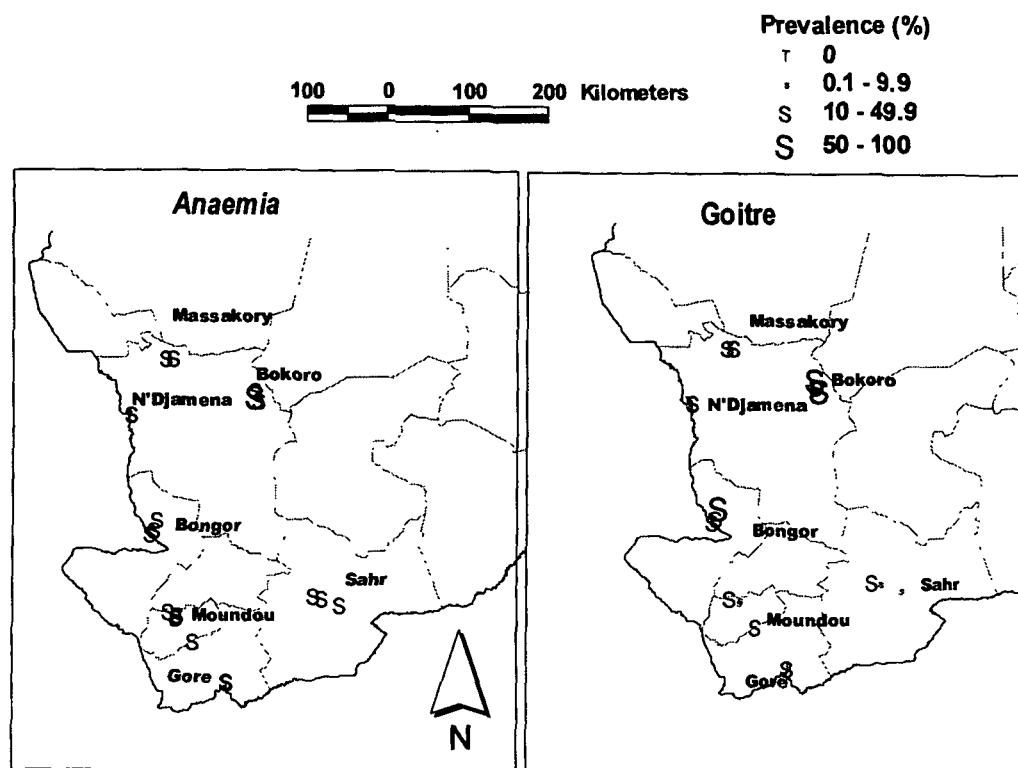


**Figure 4.** Geographical distribution of helminth infections among schoolchildren in Chad

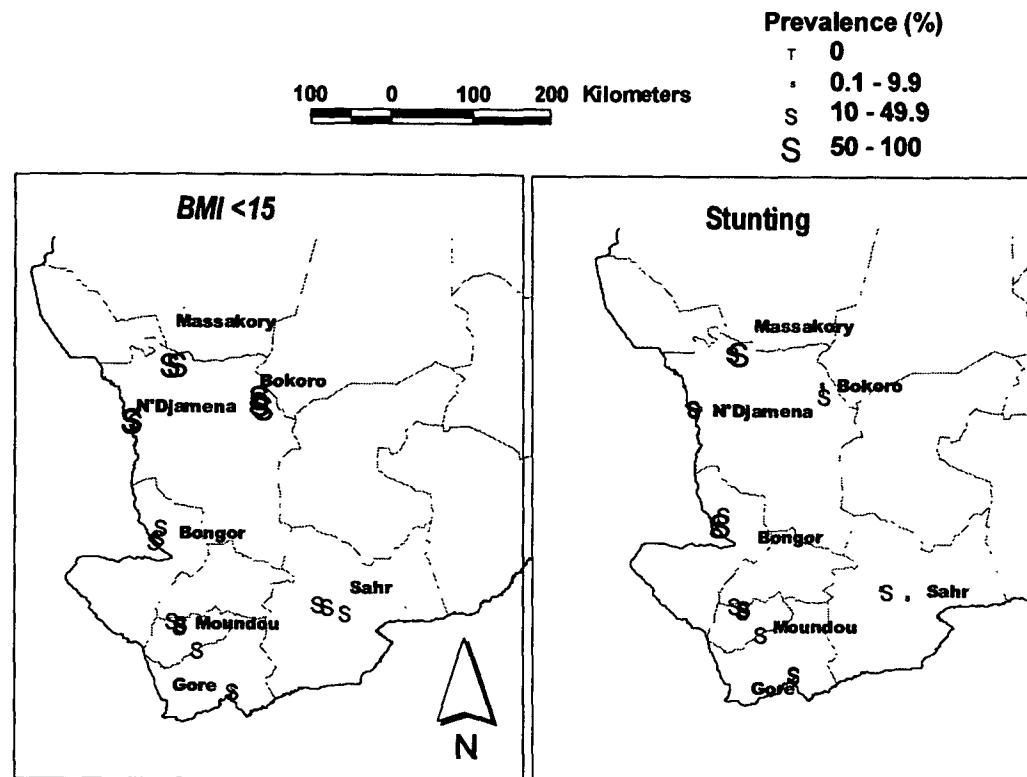
**Table 7.** The prevalence of undernutrition and anaemia and mean haemoglobin of Primary schoolschool in Chad by school and sous-préfectures

| School                   | Préfecture        | Sous-Préfecture |        | No. examined | Anaemia<br>(Hb <110 g/L) | Goitre | Stunted ht<br>(HAZ <-2 sd) | Underweight<br>(WAZ <-2 sd) | Wasted<br>(WHZ <-2 sd) | BMI <15 |
|--------------------------|-------------------|-----------------|--------|--------------|--------------------------|--------|----------------------------|-----------------------------|------------------------|---------|
| <b>N'Djamena zone</b>    |                   |                 |        |              |                          |        |                            |                             |                        |         |
| Klemat A                 | N'Djamena Nord    |                 | Urbain | 51           | 7.8                      | 121    | 0.0                        | 14.0                        | 22.0                   | 5.6     |
| La Leprosserie A         | N'Djamena Sud     |                 | Urbain | 50           | 20.0                     | 122    | 28.0                       | 6.0                         | 8.0                    | 4.5     |
| Hillé Leclerc            | N'Djamena Est     |                 | Urbain | 50           | 8.0                      | 120    | 8.0                        | 12.0                        | 24.0                   | 12.5    |
| <b>Sahélienne zone</b>   |                   |                 |        |              |                          |        |                            |                             |                        |         |
| Boulalaty                | Chari Baguirmi    | Massakory       | Rural  | 52           | 34.6                     | 113    | 36.5                       | 50.0                        | 57.7                   | 13.0    |
| Soulemanary              | Chari Baguirmi    | Massakory       | Rural  | 55           | 21.8                     | 118    | 30.9                       | 10.9                        | 32.7                   | 22.7    |
|                          |                   | Massakory total |        | 107          | 28.0                     |        | 33.6                       | 29.9                        | 44.9                   | 17.8    |
| Djimezé                  | Chari Baguirmi    | Bokoro          | Rural  | 50           | 36.0                     | 117    | 64.0                       | 4.0                         | 2.0                    | 0.0     |
| Michegue                 | Chari Baguirmi    | Bokoro          | Rural  | 51           | 29.4                     | 117    | 58.8                       | 29.4                        | 41.2                   | 4.5     |
| Bokoro - Ecole du Centre | Chari Baguirmi    | Bokoro          | Urbain | 50           | 56.0                     | 106    | 34.0                       | 6.0                         | 8.0                    | 12.9    |
|                          |                   | Bokoro total    |        | 151          | 40.4                     |        | 52.3                       | 13.2                        | 17.2                   | 6.3     |
| <b>Soudanien zone</b>    |                   |                 |        |              |                          |        |                            |                             |                        |         |
| Bongor Sieke             | Mayo Kebbi        | Bongor          | Rural  | 51           | 31.4                     | 115    | 11.8                       | 17.6                        | 13.7                   | 0.0     |
| Guizede                  | Mayo Kebbi        | Bongor          | Rural  | 50           | 20.0                     | 118    | 28.0                       | 56.0                        | 30.0                   | 0.0     |
| Gournaida                | Mayo Kebbi        | Bongor          | Rural  | 50           | 14.0                     | 119    | 61.2                       | 16.7                        | 8.3                    | 0.0     |
|                          |                   | Bongor total    |        | 151          | 21.9                     |        | 33.3                       | 30.2                        | 17.4                   | 0.0     |
| Bellevue A               | Logone Occidental | Moundou         | Urbain | 53           | 28.3                     | 118    | 26.4                       | 18.9                        | 13.2                   | 0.0     |
| Rinkou                   | Logone Occidental | Krim Krim       | Rural  | 51           | 15.7                     | 123    | 3.9                        | 12.0                        | 4.0                    | 0.0     |
| Betéré                   | Logone Occidental | Krim Krim       | Rural  | 50           | 16.0                     | 120    | 16.0                       | 20.0                        | 6.0                    | 0.0     |
| Karkaye                  | Logone Occidental | Krim Krim       | Rural  | 54           | 16.7                     | 121    | 5.6                        | 22.2                        | 13.0                   | 14.3    |
|                          |                   | Krim Krim total |        | 155          | 16.1                     |        | 8.4                        | 18.2                        | 7.8                    | 2.0     |
|                          |                   |                 |        |              |                          |        |                            |                             |                        | 32.1    |

|                             |                 |            |        |            |             |     |             |             |             |            |             |
|-----------------------------|-----------------|------------|--------|------------|-------------|-----|-------------|-------------|-------------|------------|-------------|
| Nahor                       | Moyen Chari     | Sahr       | Urbain | 52         | 38.5        | 116 | 5.9         | 6.1         | 2.0         | 0.0        | 24.5        |
| Nang-Ndah                   | Moyen Chari     | Djoli      | Rural  | 52         | 17.3        | 119 | 3.8         | 21.2        | 11.5        | 0.0        | 28.8        |
| Sanguele                    | Moyen Chari     | Djoli      | Rural  | 51         | 31.3        | 113 | 10.0        | 8.0         | 2.0         | 0.0        | 14.0        |
| <b>Djoli total</b>          |                 |            |        | <b>103</b> | <b>26.5</b> |     | <b>6.9</b>  | <b>14.7</b> | <b>6.9</b>  | <b>0.0</b> | <b>21.6</b> |
| <b><u>Tropical zone</u></b> |                 |            |        |            |             |     |             |             |             |            |             |
| Goré – Ecole du centre      | Logone Oriental | Goré       | Urbain | 51         | 31.4        | 116 | 33.3        | 23.5        | 15.7        | 0.0        | 19.6        |
| Kondjala                    | Logone Oriental | Goré       | Rural  | 50         | 22.0        | 119 | 2.0         | 18.0        | 12.0        | 0.0        | 6.0         |
|                             |                 | Goré total |        | <b>101</b> | <b>26.7</b> |     | <b>17.8</b> | <b>20.8</b> | <b>13.9</b> | <b>0.0</b> | <b>12.9</b> |



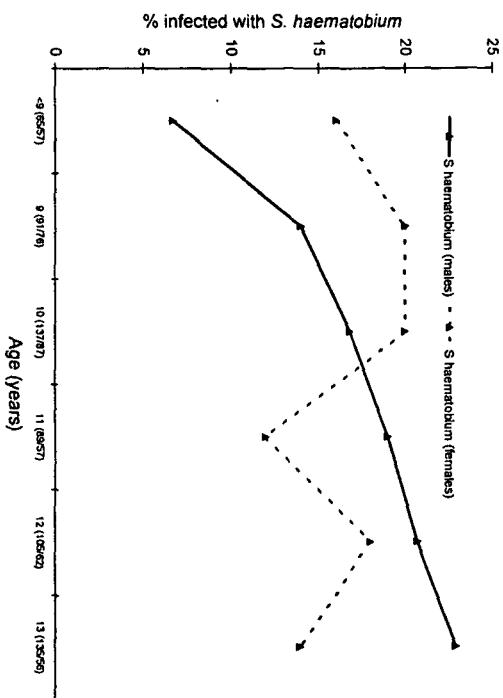
**Figure 5** Geographical distribution of micro-nutrient deficiency among schoolchildren in Chad



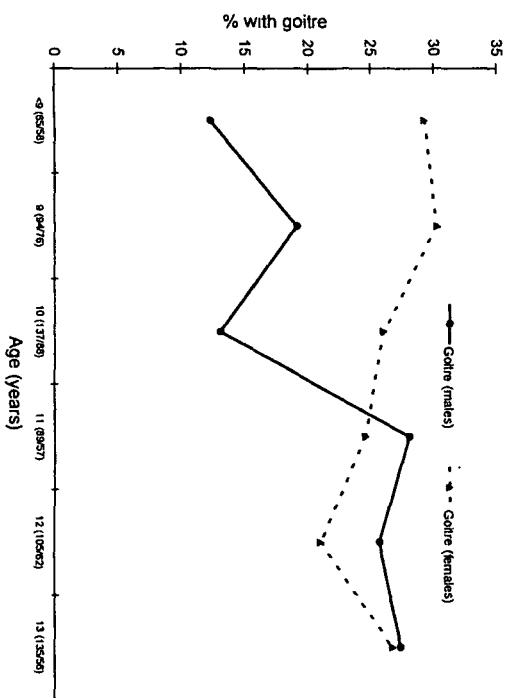
**Figure 6** Geographical distribution of under-nutrition among schoolchildren in Chad

## Appendix D: Results by age and sex

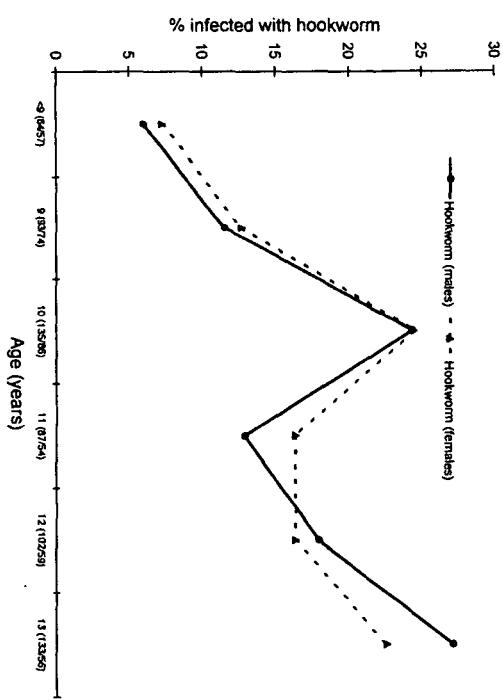
The prevalence of *S. haematobium* in boys and girls in Chad by age



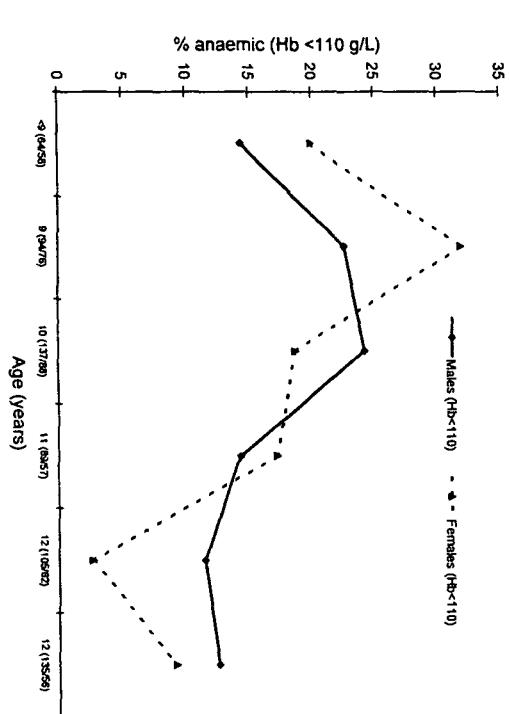
The prevalence of palpable goitre in boys and girls in Chad by age



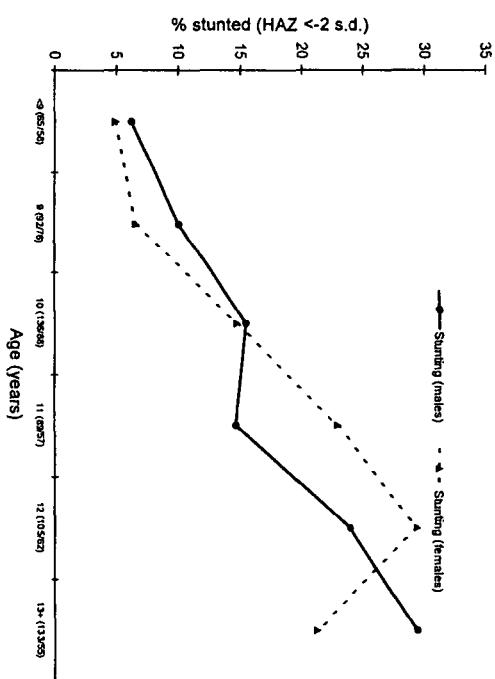
The prevalence of hookworm in boys and girls in Chad by age



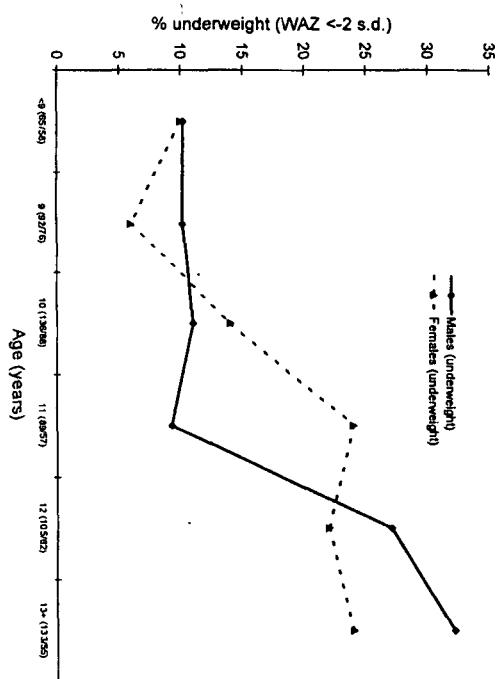
The prevalence of anaemia, defined as haemoglobin <110 g/L, in boys and girls in Chad by age



The prevalence of stunting, defined as height-for-age <-2 s.d. in boys and girls in Chad by age



The prevalence of underweight, defined as weight-for-age <-2 s.d. in boys and girls in Chad by age



**Appendix E:** Termes de Références de l'enquête sur l'état de santé des enfants scolarisables

The survey will achieve the following:

***E.1 Résultats attendus***

Répartition géographique des infections parasitaires (urinaires et intestinales) et des carences en oligo-éléments (iode, vitamine-A et fer.) Déterminer la distribution et la prévalence des infections parasitaires (urinaire et intestinaux) et des carences chez les enfants Chadiens d'âge scolaire.

***E.2 Taches:***

Déterminer les points de l'enquête à base géographique et démographique. Déterminer les points d'intervention sur la carte du Chad.

Formation de l'équipe des enquêteurs par un consultant. Appuyer l'équipe nationale de faire l'enquête avec les technologies appropriées.

Mettre en place l'enquête

- Examiner sur place : l'urine pour la bilharziose
- Examiner sur place : les selles pour les parasites intestinaux
- Réserver des spécimens d'urine pour l'examiner l'iode à N'djamena
- Prélèvement de veineux et conservation du sang
- Déterminer hémoglobine sur place
- Conserver les sérum pour la détermination de vitamine A à N'djamena
- Mesurer les goîtres
- Mesurer les paramètres anthropométriques (taille et poids).

L'enquête prendra approximativement un échantillon de 1.000 enfants en 20 écoles. Pendant l'enquête, tous les élèves infectés recevront les traitements nécessaires.

Exploiter les résultats de l'étude du carence d'Iode (fait par CNNTA/OMS/UNICEF)

Mettre en place le système des questionnaires pour déterminer la bilharziose chez les élèves.

In greater detail, the tasks of the consultant will be as follows :

**Prior to the preparatory visit**

The consultant will prepare an outline budget for the survey (attached)

The consultant will prepare a situation analysis of the health of school age children in Chad.

### During the preparatory visit

This will take place during the week 18<sup>th</sup> - 22<sup>nd</sup> September.

The consultant will meet with the school health commission to discuss the following

The survey will aim to gather data about the prevalence of parasitic infections and micronutrient deficiencies in the different ecological zones of the country. Five different zones will be sampled – Steppe, Savannah, Forest, urban N'djamena and the area next to Lake Chad. The survey will aim to sample 1000 primary school children in 20 schools (50 children sampled per school). The number of schools sampled per zone will be proportional to the population of that zone. Given the difficulties of internal travel within Chad, the consultant will work with the school health commission to decide which of the prefectures or sub prefectures of the different zones could most conveniently be sampled. Within each prefecture/sub prefecture, schools to be sampled will then be selected at random.

Liaison with prefectorial and sub prefectorial authorities.

The consultant will discuss liaison between the school health commission and prefectorial and sub prefectorial education and health authorities. A good understanding of the aims of the school health commission and commitment to the survey by local authorities will be essential to the success of the project.

The consent of parents and of schools

Before children can be sampled for parasitic infections and micronutrient deficiencies, informed consent is required from their parents. Schools too need to be fully informed of the purpose of the survey and to give consent to their participation. Given the comparative difficulty of internal travel within Chad, acquisition of consent may be a considerable logistic constraint upon the speedy completion of the survey. Thought needs to be given as to how consent may be gained speedily and effectively.

Staff availability and training

It is estimated that the survey will take about three weeks to perform. The work will be intensive, requiring personnel of skill and commitment. The consultant and school health commission will agree the number of staff required for the survey - a clinical monitor, lab technicians and public health nurses. Identification of available and suitable staff will be discussed. Given the intensity of the work to be done, suitable payment for the survey will be discussed. During the visit, the consultant will appraise the skills of potential staff and identify outstanding training needs.

Transport for the survey

The consultant will discuss with the school health commission and with world Bank staff the provision of four wheel drive vehicles for the survey. It is estimated that two will be needed.

#### Storage of serum during the survey

Assessment of vitamin A and iodine status demand that serum samples be taken and kept frozen for later analysis. The logistics of keeping samples frozen during the progress of the survey will need to be investigated. Possible methods might include storing samples in large quantities of dry ice or, preferably in liquid nitrogen. During the visit, the availability of these in Chad will need to be investigated.

#### Schistosomiasis questionnaire

The potential for use of schistosomiasis questionnaires in Chad will be investigated. A draft questionnaire will be submitted to the school health commission for local review and adaptation to local circumstances. Once the prefectures/sub prefectures to be surveyed in each region have been identified, schistosomiasis questionnaires will be sent out to all schools in that unit to be returned to the school health commission prior to the survey in November.

#### Availability of HPLC and Radio assay technology in Chad

The possibility of assessing serum retinol and iodine (what to do) in N'djamena will be assessed. Should necessary technology be unavailable locally, the commission will need to decide where overseas samples should be analysed.

#### Shipping and Clearance of Equipment

During the September visit the Commission and World Bank staff will decide how equipment to be brought into Chad will be cleared through Chadian customs.

#### Future usage of equipment

In order to conduct the survey, several items of capital equipment - microscopes, computer etc. - will need to be purchased. The consultant will discuss what will happen to that equipment after the survey with the School Health Commission and the World Bank representative. Ideally it should go where most needed but where it can be accessed by the school health commission for any future work.

#### The November Survey

Following the preparatory visit in September, the school health commission will be responsible for notification of prefectorial authorities and schools about forthcoming survey, gaining the informed consent of parents and arranged for the transport of the survey team to field sites.

During the survey the consultant will provide technical expertise with respect to collection of urine, stool and blood samples. He will provide guidance and quality assurance with respect to microscopic examination of samples and will also enable the survey team accurately to measure indices of anthropometric status and goitre. He will work with the team to ensure the proper processing of blood samples.

On completion of the survey the consultant will work with the commission to enable entry and analysis of data and will present results to the commission, the ministries of education and health, prefectures and subprefectures, schools and parents.

## **Appendix F: Survey Itinerary**

|                           |   |
|---------------------------|---|
| 31 <sup>st</sup> October  | Initial meeting of school health commission   |
| 1 <sup>st</sup> November  | Staff training  |
| 2 <sup>nd</sup> November  | Survey of Klemat A, N'djamena   |
| 3 <sup>rd</sup> November  | Survey of Klemat A, N'djamena   |
| 4 <sup>th</sup> November  | Treatment at Klemat A, N'djamena  |
| 5 <sup>th</sup> November  | Travel to Sahr  |
| 6 <sup>th</sup> November  | Survey of Nahor, Sahr   |
| 7 <sup>th</sup> November  | Treatment at Nahor, Sahr<br>Survey of Nang-Ndah, Djoli<br>Survey of Sanguele, Djoli   |
| 8 <sup>th</sup> November  | Treatment at Nang-Ndah, Djoli<br>Treatment at Sanguele, Djoli<br>Travel to Goré   |
| 9 <sup>th</sup> November  | Survey of Ecole du Centre, Goré<br>Survey of Kondjala, Goré   |
| 10 <sup>th</sup> November | Treatment at Ecole du Centre, Goré<br>Treatment at Kondjala, Goré<br>Travel to Moundou  |
| 11 <sup>th</sup> November |   |
| 12 <sup>th</sup> November |   |
| 13 <sup>th</sup> November | Survey of Bellevue, Moundou<br>Survey of Rinkou, Krim Krim  |
| 14 <sup>th</sup> November | Treatment at Bellevue, Moundou<br>Treatment at Rinkou, Krim Krim<br>Survey and treatment of Beteré, Krim Krim<br>Survey and treatment of Karkaye, Krim Krim |
| 15 <sup>th</sup> November | Travel to Bongor  |
| 16 <sup>th</sup> November | Survey and treatment of Bongor Sieke, Bongor  |

|                           |   |
|---------------------------|---|
|                           | Survey and treatment of Guizede, Bongor   |
| 17 <sup>th</sup> November | Survey and treatment of Gournaida, Bongor<br>Travel to N'djamena  |
| 18 <sup>th</sup> November |   |
| 19 <sup>th</sup> November | Travel to Massakory   |
| 20 <sup>th</sup> November | Survey and treatment of Boulalaty, Massokory<br>Survey and treatment of Soulemanary, Massakory<br>Travel to Massaguet |
| 21 <sup>st</sup> November | Travel to Bokoro<br>Survey and treatment of Ecole du Centre, Bokoro   |
| 22 <sup>nd</sup> November | Survey and treatment of Djimezé, Bokoro<br>Survey and treatment of Michegue, Bokoro                                   |
| 23 <sup>rd</sup> November | Travel to N'djamena   |
| 24 <sup>th</sup> November | Survey of La Leprosserie A, N'djamena<br>Survey of Hillé Leclerc, N'djamena   |
| 25 <sup>th</sup> November | Treatment at La Leprosserie A, N'djamena<br>Treatment at Hillé Leclerc, N'djamena                                     |

### **Appendix G: Survey personnel**

|                          |  |
|--------------------------|--|
| Mr Elie Djenguinabe      | Educationalist, School Health Commission, Ministry of Education  |
| Dr Marie Baboguel        | Doctor, School Health Commission, Ministry of Health   |
| Mr Mountanan Ndinardmtan | Senior Laboratory Technician, Hopital du Reference, N'djamena  |
| Miss Esther Mobele       | Senior Laboratory Technician, Hopital du Reference, N'djamena  |
| Mrs Madaleine Ngodjo     | Nurse, School Health Division, Ministry of Health  |
| Mrs Lea Kaidonoum        | Midwife, Ministry of Health  |
| Mr Abderaman, Fodi       | Driver, Chad Evasion   |
| Mr Djimadoum Ngardina    | Driver, Chad Evasion.  |
| Dr Simon Brooker         | Epidemiologist, Department of Infectious Disease Epidemiology, Imperial College School of Medicine, London |
| Dr Michael Beasley       | Epidemiologist, Department of Infectious Disease Epidemiology, Imperial College School of Medicine         |

**MALI, 1997**



# **School Based Health and Nutrition Preliminary Information for the Development of a Program in Mali**

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**Michael Beasley**

Partnership for Child Development, University of Oxford

**Penelope Bender**

The World Bank, Washington

**Don Bundy**

Partnership for Child Development, University of Oxford

**Robert Prouty**

The World Bank, Washington



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## **1. Background**

### ***1.1. Introduction***

In 1997, the population of Mali was estimated to be 10.8 million with an annual growth rate of 3%. The population is young with those aged less than 18 years estimated to make up 54% of the population. Mali's socioeconomic indicators are poor. The Country's GNP is estimated to be US \$ 250 per annum. The fertility rate is high with a total fertility of 7.2 children per woman. Life expectancy at birth is 47.3 years. The infant mortality rate is 117 children per 1000 live births whilst under five mortality is estimated to be 210/1000 live births (U.S. Bureau of Census, 1997; UNICEF, 1997).

Little information is available concerning a large percentage of the country's population, the school age children (5-19 years) who make up around 37% of Mali's population. Most childhood health data available concerns those aged less than five years old.

Data from other developing countries indicates the widespread occurrence of morbidity among school age children. Morbidity encountered during the school years may be of particular importance since it occurs at a time of physical development and often at the only time in life when a person will have access to formal education (Bundy and Guyatt, 1996). Programs to deliver health and nutrition interventions to school aged children in Mali will counter this morbidity, helping Malian children to take better advantage of the educational opportunities available to them.

### ***1.2 Objectives***

The aim of this preliminary review is to gather available data on the health and education of school aged children (5-18 years) in order to inform the design of programs which aim to improve the health and educational achievement of Malian school children and also to identify gaps in existing knowledge which need to be filled in order for programs to function effectively.

#### ***1.2.1 Specific Objectives***

- To collect information on the health of school age children that can be obtained from official and unofficial sources such as the published literature, reports published by the Malian government, international agencies such as the World Bank and UNICEF and by NGOs.
- To identify priority health problems of school age children.
- To provide an overview of current school-based health service provision for children aged 5-18 years, as well as specific policies targeting the health of these children.
- To identify gaps in information required for further in-depth investigation to contribute to the development of approaches for monitoring and evaluation of school based health programs in Mali.
- To suggest possible strategies for a school health program.

### *1.3. Methodology*

Data was collected by use of document review. Documents were collected following searches of computerized literature databases and also through liaison with offices of the World Bank, UNICEF, USAID and NGOs. Information was also obtained through review of appropriate internet sites.

The review focused on a wide range of issues concerning the health and welfare of school age children. Information reviewed included the demographic characteristics of morbidity and mortality, nutritional deficiencies, infection, and health issues of adolescents. The use of the school system to reach school age children was considered as were the content of school age services. Provision of health care to school children by government and other agencies was investigated.

## **2. Demographic and Health Situation**

### *2.1 Demographic Characteristics of the School-age Population*

Census data from 1987 estimated the total population of school age children (5-19 years) to be 2,831,405 contributing to approximately 37% of Mali's total population. The youngest children aged 5-9 years made up the greatest proportion, contributing 16% of the country's population, while the 10-14 years and 15-19 years accounted for 11% and 9% respectively. Within the school age group, children aged 5-9 years made up 44%, those aged 10-14 years 31% and those aged 15-19 years 26% of all these children (US Bureau of Statistics, 1997).

The number of school aged children and numbers enrolled in public primary schools by region in 1995/96 are given in Table 1. The school age population is expected to grow rapidly in future years as indicated by the population predictions shown in Table 2, almost doubling between the years 1987 and 2007.

**Table 1 : Number of primary school age children (lower cycle) public primary schools, classes and pupils by region**

| Region       | Total number children age 7-14 | Schools      | Classes       | Boys enrolled  | Girls enrolled | Total children enrolled | Ratio boys: girls |
|--------------|--------------------------------|--------------|---------------|----------------|----------------|-------------------------|-------------------|
| Kayes        | 304,003                        | 231          | 1,328         | 45,212         | 24,906         | 70,118                  | 1.88              |
| Koulikoro    | 347,433                        | 374          | 2,205         | 64,789         | 37,699         | 102,488                 | 1.72              |
| Sikasso      | 412,576                        | 297          | 1,868         | 61,110         | 36,045         | 97,155                  | 1.70              |
| Segou        | 390,862                        | 213          | 1,398         | 47,990         | 30,310         | 78,300                  | 1.58              |
| Mopti        | 325,718                        | 175          | 1,108         | 30,514         | 18,967         | 49,481                  | 1.61              |
| T'bouctou    | 108,573                        | 73           | 424           | 10,240         | 7,045          | 17,285                  | 1.45              |
| Gao          | 86,858                         | 84           | 443           | 10,655         | 6,865          | 17,520                  | 1.55              |
| Kidal        | 8,686                          | 8            | 29            | 868            | 419            | 1,287                   | 2.07              |
| Bamako       | 195,431                        | 201          | 1,652         | 62,127         | 54,523         | 116,650                 | 1.14              |
| <b>Total</b> | <b>2,180,140</b>               | <b>1,656</b> | <b>10,455</b> | <b>333,505</b> | <b>216,779</b> | <b>550,284</b>          | <b>1.54</b>       |

(Data: Ministere de l'Education de Base, 1996)

**Table 2 : Midyear population projections ('000) of Malian School Age Children 1987-2007**

| <b>Age (years)</b> | <b>1987</b> | <b>1992</b> | <b>1997</b> | <b>2002</b> | <b>2007</b> |
|--------------------|-------------|-------------|-------------|-------------|-------------|
| 5-9                | 1170        | 1288        | 1525        | 1820        | 2114        |
| 10-14              | 949         | 1112        | 1241        | 1488        | 1784        |
| 14-19              | 749         | 907         | 1078        | 1216        | 1426        |
| <b>Total</b>       | <b>2868</b> | <b>3307</b> | <b>3845</b> | <b>4524</b> | <b>5360</b> |

(U.S. Bureau of Census, 1997)

## *2.2 Mortality and Morbidity Patterns*

School-age mortality patterns as estimated from 1987 census data provide age specific mortality rates for age groups 5-9, 10-14 and 15-19 as shown in Table 3. The school age group are those who have survived the much greater probability of death in the under five-age group. Current estimates of infant mortality (number of children dead by age one per thousand live births) and child mortality (number of children dead by age five per thousand live births) are 117 and 210 respectively (UNICEF, 1997).

**Table 3 : Age specific death rates by sex, among school age children in 1987**

|             | <b>Males</b> | <b>Females</b> | <b>Both Sexes</b> |
|-------------|--------------|----------------|-------------------|
| 5-9 years   | 4.66         | 3.90           | 4.22              |
| 10-14 years | 2.47         | 2.15           | 2.31              |
| 15-19 years | 3.09         | 3.43           | 3.27              |

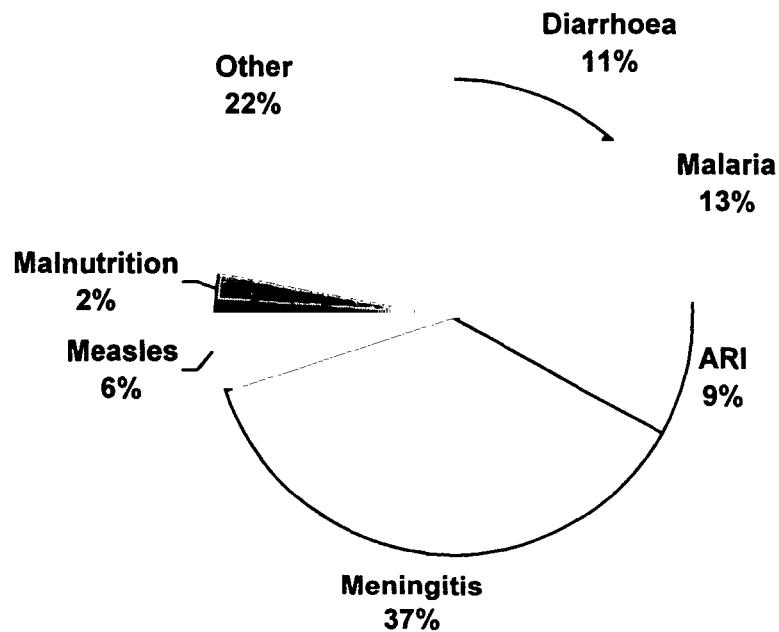
(Death rates are given per 1000 persons per year. Extracted from 1987 Census Data, (US Bureau of Census, 1997).

Although Mali has a national health information system in place, CIHI (1995) reported that summary reports of national-level data on causes of death and also morbidity rates are seldom produced. Further, the information that is produced is based on reported diagnoses in a heavily burdened health care system that sees and reports on only a very limited number of the total illnesses and deaths that occur.

### *2.2.1 Causes of mortality amongst school age children*

Estimates of causes of mortality in Mali vary. Statistics reported by the Service d'Information et Statistique, 1996 and cited by a World Bank Resident Mission report (Figure 1) estimated that amongst children aged from 5-14 years old, meningitis is the principal cause of mortality, while other causes include malaria, diarrhea diseases and respiratory infections. Measles and malnutrition were reported to cause mortality in this age range but to a much lesser degree than among younger age groups. Other causes of death accounted for 22% of mortality.

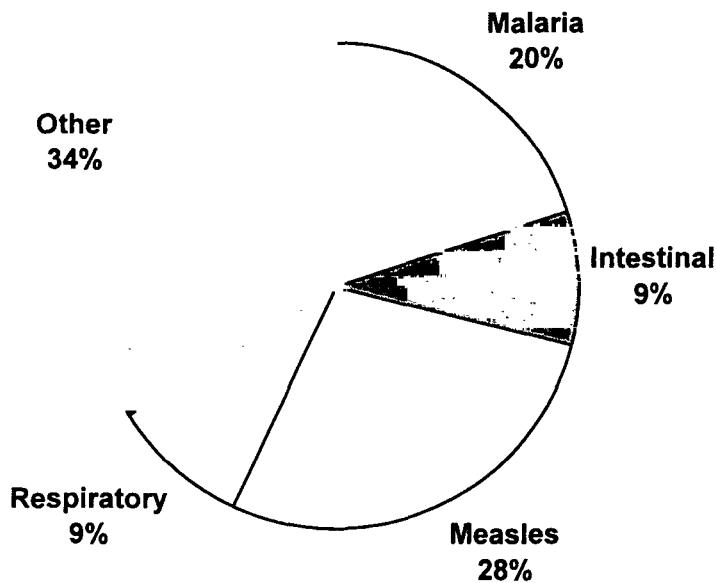
**Figure 1 : Causes of mortality amongst children aged 5-14 years**



(Service d'Information et Statistique, 1996 cited by World Bank Resident Mission report)

A different study of mortality amongst 5-9 year old children determined from mothers' reports of symptoms in Kayes (Gray, 1990 cited by CIHI, 1995) (Figure 2) estimated that 20% of mortality was caused by malaria, 9% from intestinal related causes, 28% from measles, 9% from respiratory causes and 34% unknown.

**Figure 2 : Causes of mortality amongst children aged 5-9 years**



(Gray, 1990, cited by CIHI, 1995)<sup>1</sup>

The contrast between the two studies is conceivable should the first have occurred during the year of a meningitis epidemic and the second during the year of a measles epidemic such as that which occurred in 1991 (CIHI, 1995).

It is clear that further studies are required to determine causes of mortality amongst Malian school children. In particular, an accurate estimate of the proportion of deaths caused by measles and meningitis is required.

### 2.2.2. *Causes of morbidity amongst school age children*

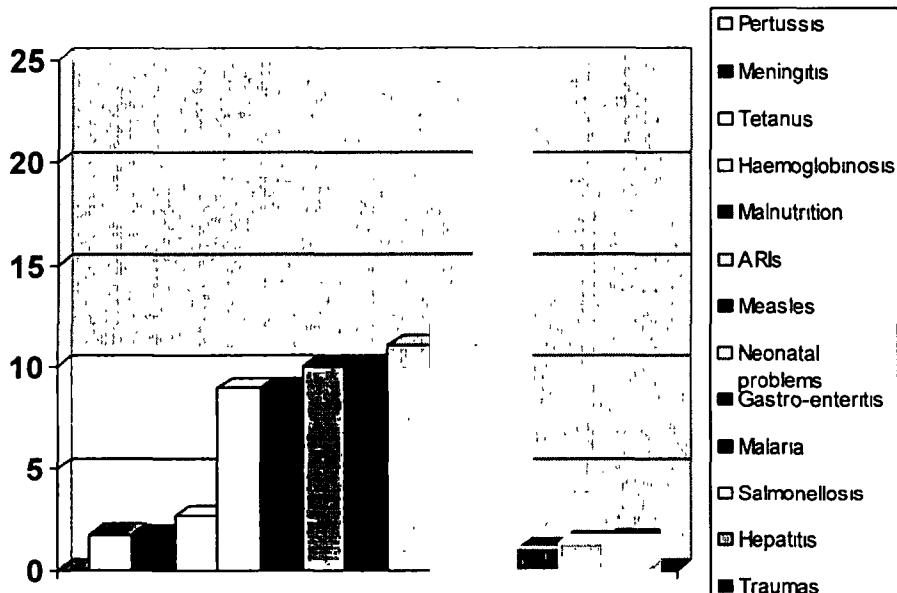
An assessment of the impact of major diseases among children aged less than 15 years in rural Mali, incorporating mortality as well as morbidity, (Duflo *et al.*, 1986 cited by CICH, 1995), found that combined health problems resulted in 111 'healthy days lost' per child per year (Figure 3)<sup>2</sup>. Most days were lost due to malaria, diarrhea) diseases, 'neonatal problems', acute respiratory infections and measles.

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<sup>1</sup> Intestinal causes were not specified, but were assumed to include diarrhoea.

<sup>2</sup> Note that data are for school age children and younger children , combined.

**Figure 3 : Healthy days lost per child per year among children aged under 15 in rural Mali by cause of illness**



(Duflo *et al.*, 1986 cited by CICH, 199)

#### 2.2.3. Data required

Information on the major causes of death and illness is fundamental to the selection of priority interventions. Data collected thus far gives only national mortality figures of school age children and little data has been found concerning morbidity. So that interventions can be carefully targeted, mortality and morbidity data are needed by:

- age and sex of those affected
- the urbanization and geographic region of their location
- the seasonality of incidence.

Data are needed concerning health problems that begin in childhood and adolescence but that manifest themselves only in later life such as renal failure due to schistosomiasis.

Data are also required concerning trends on mortality and morbidity. Identifying whether a problem is increasing or decreasing through time will aid the identification of future priorities.

### 2.3 Infectious Disease amongst Malian School Children

#### 2.3.1 Parasitic worm infections

##### **Schistosomiasis and geohelminth infections**

The prevalences of schistosomiasis and geohelminth infections have been estimated in Mali both nationally and by region (De Clercq *et al.*, 1995). Estimates were based on data from the National

Schistosomiasis Control Program of Mali and surveys by the authors. With the exception of a school-based sample in Bamako, estimates were made from samples of individuals of all ages living in villages. The study is likely to have underestimated the prevalence of infection of school age children since they are the population group most commonly and heavily infected with parasitic helminths (Bundy *et al.*, 1987; Bradley and McCullough, 1973).

The overall prevalence of schistosomiasis in Mali was 30%, but infection varied considerably by region (Table 4). Data concerning the distribution of schistosome species were not given in this survey but probably refer principally to urinary schistosomiasis (*Schistosoma haematobium*). The prevalence of hookworm was 8.0% whilst that of *Ascaris lumbricoides* (roundworm) was 0.12% and of *Trichuris trichiura* (whipworm) was 0.42%. The prevalence of hookworm varied considerably by region.

**Table 4 : Prevalence of schistosomiasis and hookworm infection in the seven regions of Mali and the district of Bamako**

| Region     | No. Subjects Examined | % Prevalence Schistosomiasis | % Prevalence Hookworm |
|------------|-----------------------|------------------------------|-----------------------|
| Kayes      | 2424                  | 47.6                         | 11.5                  |
| Koulikouro | 1570                  | 49.8                         | 6.7                   |
| Sikasso    | 6177                  | 1.4                          | 18.7                  |
| Segou      | 4149                  | 59.6                         | 1.1 '                 |
| Mopti      | 674                   | 30.4                         | 4.8                   |
| Tombouctou | 875                   | 19.9                         | 0                     |
| Gao        | 1763                  | 19.7                         | 0.1                   |
| Bamako     | 448                   | 45.8                         | 5.1                   |

(De Clerq *et al.*, 1995) \* sample comprised school children

WHO recommends that mass treatment of intestinal helminths should occur if prevalence is 50% or greater. In especial circumstances such as where there is considerable malnutrition, mass treatment is recommended at lower prevalence. UNICEF recommends that mass treatment occur where prevalence is 30% or higher.

WHO recommends mass treatment for schistosomiasis as shown in Table 5.

**Table 5 : Cut off points used to determine treatment strategies for schistosomiasis**

| % prevalence amongst 7-14 year olds | Strategy suggested                          |
|-------------------------------------|---|
| >50%                                | Mass treatment of whole community           |
| 20-50%                              | Mass treatment of 5-19 year olds            |
| <20%                                | Treatment of positive children on screening |

(W.H.O., 1993).

A national survey of prevalence and intensity of infection with *S. haematobium* (Traore *et al.*, in press) found estimates of infection amongst 7-14 year old children as shown in Table 6.

**Table 6 : Prevalence and intensity of infection with *S. haematobium* among Malian children aged 7-14 years old**

| Area             | % Prevalence | Intensity geometric mean egg count/10 ml urine in positive cases) |
|------------------|--------------|---|
| Irrigation O.N.  | 83.5         | 36.2  |
| Irrigation Bag.  | 45.1         | 15.2  |
| Small reserv. PD | 73.4         | 23.8  |
| Senegal river    | 81.6         | 36.6  |
| Niger river      | 70.8         | 21.5  |
| Selingue dam     | 22.9         | 8.2   |
| Manantali dam    | 35.1         | 11.3  |
| Soudanian        | 5.3          | 11.2  |
| North-Soudanian  | 11.5         | 15.9  |
| Sahel            | 33.3         | 20.7  |
| Sahara           | 38.8         | 21.1  |
| Delta            | 34.5         | 11.9  |
| Bamako           | 50.5         | 12.2  |

ON=Office du Niger; Bag.=Baguineda; PD=Plateau Dogon; reserv.=reservoirs  
(Traore *et al.*, in press)

Irrigation schemes and dam projects in Mali may be a particular cause of risk of schistosomiasis. Vercrysse *et al.* (1994) report that the four main areas of high prevalence of *S. haematobium* are Office du Niger (irrigation areas), Bandiagara (small dams), Selingue (dam areas) and Baguineda (irrigation areas). Apart from in the Office du Niger, *S. mansoni* infections are not severe but do occur throughout the country (Appendix B). Evidence of high prevalence of intensity of infections of both *S. haematobium* and *S. mansoni* amongst school aged boys and girls in Office du Niger is given in Table 7.

**Table 7 : Prevalence of infection with *S. haematobium* and *S. mansoni* among school aged boys and girls living in villages in the area of Office du Niger**

| Age   | <i>S. haematobium</i> (%) |       |       | <i>S. mansoni</i> (%) |       |       |
|-------|---------------------------|-------|-------|-----------------------|-------|-------|
|       | Boys                      | Girls | Total | Boys                  | Girls | Total |
| 5-9   | 74.1                      | 82.4  | 78.3  | 65.2                  | 68.1  | 66.7  |
| 10-14 | 83.3                      | 76.2  | 79.8  | 60.7                  | 69.2  | 64.8  |

(Diana, 1990)

Infections with *S. haematobium* can be highly prevalent in urban as well as rural areas. In Bankoni, a district of Bamako, Doumbo *et al.* (1992) found that prevalence of *S. haematobium* was 49.5% among 5-9 year olds and 47.9% among 10-15 year olds. Prevalence of *S. mansoni* in the same population was 3.4%.

Recent studies in Mali have investigated associations between infection with worms and educational indicators such as school attendance, absenteeism and educational achievement.

Sacko (1997) found that the prevalence of infection with geohelminths and *S. haematobium* of school attendees did not differ significantly from that of non-school attendees. De Clercq *et al.* (in press) found that intensity of infection with *S. haematobium* was associated with low academic performance and absenteeism although absenteeism was the main factor explaining variation in academic performance.

The fact that urinary schistosomiasis is the most widespread species will facilitate school based control. Infection with this parasite results in the passage of bloody urine, a diagnostic sign which children can self report, and which provides the most cost-effective way of targeting schistosomiasis control.

#### *Cestodes (tapeworm)*

Although national data are unavailable, evidence exists that cestodes may infect many children in Mali. A study amongst school children in Bamako found that the prevalence of cestode infection ranged from 1.4-17.7% (Institut National de Recherche en Sante Publique).

#### *Dracunculiasis (Guinea worm)*

Dracunculiasis continues to occur in Mali (MMWR weekly report, 1994). In 1991/1992 a national village by village search for cases of dracunculiasis detected 16060 cases in 1264 villages in five of seven regions. Approximately 95% of cases were enumerated in two regions (Mopti and Kayes) (Table 8). Following control measures, a provisional total of 5779 cases were reported for 1993. Mali is part of the global initiative to eradicate Guinea worm.

**Table 8 : Cases of dracunculiasis detected in 1992 by region**

| Region     | No affected villages | No cases |
|------------|----------------------|----------|
| Mopti      | 720                  | 9154     |
| Kayes      | 379                  | 6504     |
| Segou      | 87                   | 277      |
| Koulikouro | 44                   | 89       |
| Sikasso    | 34                   | 36       |

No data was available from Gao and Tombouctou. (MMWR weekly report, 1994)

#### *Onchocerciasis (river blindness)*

Onchocerciasis is limited to a few tributaries of the Niger and Senegal rivers of the far West of Mali and along a brief stretch of the Niger Northeast of Bamako. By calculation of community microfilarial load (a measure of severity of the disease), surveys of the Bakoye and Foleme rivers, tributaries of the Senegal river near the Guinea border found only a modest prevalence of infection which could cause disease in the Southernmost villages. Mass ivermectin treatment was advocated along the Bakoye straddling the Guinean border and selective treatment of villages by local health authorities in the Foleme river basin in the West. Mali comes within the World Bank/WHO Onchocerciasis Control Program (OCP) area.

### *2.3.2 Malaria*

Malaria is the single most commonly identified cause of death in Mali (CIHI, 1995) and is estimated to be the cause of 32.2% of morbidity in Bamako and 31.5% of morbidity elsewhere in the country (World Bank Resident Mission Report). Since these results are diagnosed on clinical evidence, a proportion is probably attributable to ARI and measles. In a study of nomadic and semi nomadic populations in the Gourma, Chabasse et al., (1985) found that the prevalence of infection of 0-7 year olds was 69% while that of people aged over 7 was 60%. IFI malaria titres over 1/80 were 29% and 72% respectively.

Incidence is highest during the June-October rainy season but transmission occurs year round (CIHI, 1995). In a study of people living in Doua, the prevalence of infection of 2-9 year old children was 63.8% in the wet season (October, 1988) as compared with 28.2% in the dry season (April, 1989) (Toure et al., 1996). Transmission occurs throughout the country except in the far North.

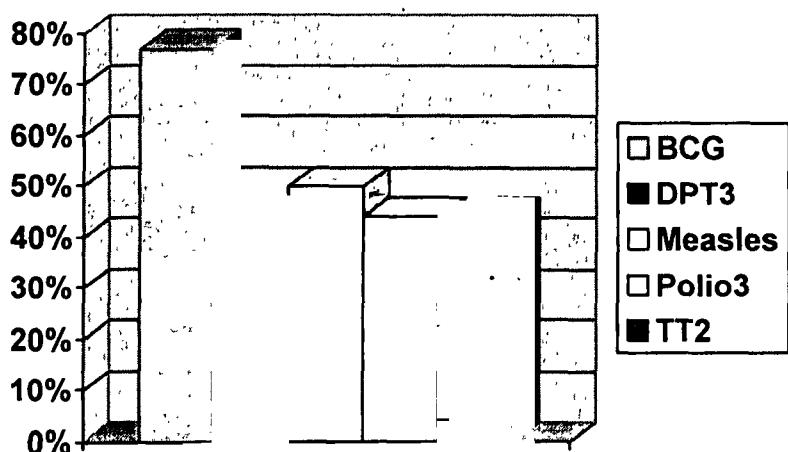
Chloroquine resistance was first observed in Mali around 1987-88 and varies according to geographic area between 0-28% for chloroquine and 0-23% for sulfadoxypyrimetrine (Frere, 1995 cited by CIHI, 1995).

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### *2.3.3 Vaccine-preventable infections*

Vaccine preventable infections are widespread in Mali and account for many child deaths each year. Vaccination coverage stands at about fifty percent for each of the four major childhood vaccines except BCG, for which the reported coverage is 77% (Figure 4).

**Figure 4 : Vaccination coverage in % amongst Malian children, 1993 by 12 months of age**



(CIHI, 1995)

Reported annual incidence of vaccine-preventable disease in Mali is given in Table 9.

**Table 9                  Reported annual incidence of vaccine-preventable diseases**

| Disease          | 1989 | 1990 | 1991  | 1992 | 1993 | 1994 |
|------------------|------|------|-------|------|------|------|
| Measles          | 3605 | 1388 | 13473 | 7830 | 1095 | 2183 |
| Pertussis        | 1047 | 430  | 230   | -    | -    | -    |
| Total tetanus    | 617  | 365  | 350   | 311  | 40   | -    |
| Neonatal tetanus | 230  | 203  | 171   | 73   | 40   | 18   |
| Tuberculosis     | 1626 | -    | -     | -    | 3309 | -    |
| Poliomyelitis    | 178  | 63   | 145   | 63   | 26   | 6    |
| Diphtheria       | 13   | 5    | 6     | -    | -    | -    |

(W.H.O., 199 cited by CIHI, 1990.

Data were not found concerning the extent to which school age children are affected by these infections. Figures 1, 2 and 3 indicate that measles is a major health problem for school age children.

In 1990, the annual incidence of tuberculosis in Mali was 289 cases of tuberculosis per 100,000 population (World Bank, 1993 cited by CIHI, 1995). This figure far exceeds median levels among other African nations as well as developing nations in general. If correct, the figure would imply an annual total of 25,000 cases, almost ten times greater than the number of cases reported to WHO as shown in Table 9.

#### *2.3.4 Skin infections*

A study of skin infections amongst 1817 children aged from 1 month to 12 years living in Koulikoro (Mahe *et al.*, 1995) found that the mean prevalence of skin diseases was 34% with the most frequent dermatoses being pyoderma (12.3%), tinea capitis (9.5%), pediculosis capitis (4.7%) scabies (4.3%) and molluscum contagiosum (3.6%). The most troublesome dermatoses were scabies and severe pyoderma. Of the different infections, only pyoderma was associated with poor individual or household hygiene. The study found that children seldom used public health services for the treatment of skin infections, probably because of inadequate response by the services and high cost of treatment.

#### *2.3.5 Other infections*

Figures 1, 2 and 3 indicate that acute respiratory tract infections, meningitis and diarrhea are common and major health problems of school age children.

Little national data is available to describe the epidemiology of other infections in Mali. Studies of nomadic and semi-nomadic populations living in the Malian Gourma (Chabasse *et al.*, 1985) found high prevalences of *Treponema pallidum* (congenital syphilis) identified by haemagglutination assay (86% and 53% prevalence amongst 5-9 and 10-23 year olds

respectively)<sup>3</sup>. The prevalence of brucellosis amongst the same population was 20% among 5-9 year olds and 27% among 10-14 year olds. Out of 1995 clinical examinations in the population, fourteen skin lesions observed were reminiscent of leprosy (incidence rate of leprosy in Mali is significantly higher than in most other African countries (CIHI, 1995)).

Infections that also affect Malian school age children to differing degrees are cholera, trachoma, sleeping sickness (trypanosomiasis) and yellow fever. Little data exists concerning the extent of these problems (CIHI, 1995).

### *2.3.6 Data required concerning infectious disease amongst Malian school children*

Very few data have been found concerning the prevalence of infectious disease amongst Malian school aged children.

Information is required by age, sex, region and season of incidence of the following infections:

- Parasitic infections including malaria and helminth infections
- Respiratory infections, including tuberculosis
- Recurrent or intermittent fevers, including those from malaria and acute
- Respiratory infection
- Immunizable disease (polio, tetanus, typhoid, measles)
- Skin infections
- Meningitis

## *2.4 Nutritional Deficiencies*

### *2.4.1 Vitamin A Deficiency*

Few data are available concerning vitamin A deficiency among school age children and most studies have been of children aged less than 5 years old. Table 10 reports the findings of a regional study of deficiency conducted in 1975.

**Table 10 : Prevalence of manifestations of vitamin A deficiency amongst children aged 0-5 years by region**

| Area           | N   | %a Conjunctival xerosis | % Xerophthalmia and keratomilacia | % Hypovitaminosis A |
|----------------|-----|-------------------------|-----------------------------------|---------------------|
| Douentza       | 118 | 7.6                     | 1.7                               | 9.3                 |
| Sevare (Mopti) | 34  | 8.8                     | 0.0                               | 11.8                |
| Gao            | 47  | 8.5                     | 6.4                               | 14.9                |
| Bourem         | 61  | 11.5                    | 1.6                               | 13.1                |
| Ansongo        | 78  | 17.9                    | 2.6                               | 20.5                |
| Tombouctou     | 202 | 7.9                     | 0.5                               | 8.4                 |
| Ber            | 184 | 1.1                     | 0.0                               | 7.1                 |

<sup>3</sup> These prevalences are extraordinarily high. Further investigation is needed to establish their accuracy and the data should by no means be interpreted as being normative in Mali

|                        |    |     |       |     |
|------------------------|----|-----|-------|-----|
| (Tombouctou)           |    |     |       |     |
| Kabara<br>(Tombouctou) | 99 | 9.1 | 0.0 - | 9.1 |

(Data from Wolcan, 1975 cited by Ministere de la Sante, 1992)<sup>4</sup>

WHO has developed cut off points above which vitamin A deficiency is considered to be a public health problem. The cut offs are: night blindness > 1%, Bitot's spots > 0.5%, active corneal lesions > 0.01 % or corneal scarring > 0.05%.

Results of studies conducted among school age children are shown in Table 11.

**Table 11 : Prevalence of manifestations of vitamin A deficiency older children by region**

| Area                    | Age (years) | N   | Symptoms observed                                       | % Prevalence            |
|-------------------------|-------------|-----|---|-------------------------|
| Koutiala (1)            | 5-7         | 651 | Night blindness   | 2.9                     |
| Douentza (2)            | 3-7         | 906 | Night blindness<br>Bitot's spot<br>Corneal scarring     | 2.7<br>0.5<br>0.0       |
| Tombouctou (3)<br>Segou | 6-10        | 538 | Night blindness<br><br>Bitot's spot<br>Corneal scarring | 9.48<br><br>0.19<br>1.3 |

(1) Helen Keller International (1986) cited by Rapport National sur la Nutrition (1992).

(2) Farbos *et al.* (1995)

(3) Ag Bendech *et al.* (1995)

WHO (1995) cited biochemical studies in Mali which found that 15.1% of 2-10 year old children in north west Bamako had serum retinol levels less than 0.35 μmol/l (WHO cut off point used to indicate vitamin A deficiency). A further study in Southern Mali found that 12% of children aged 0-6 years of age had levels less than 0.35 μmol/l.

#### 2.4.2 Iodine deficiency

Iodine deficiency is widespread in Mali and goiter is extremely common. The national prevalence of deficiency (total goiter rate) has been estimated to be around 30% (Micronutrient Deficiency Information System, 1993; Ministere de la Sante, 1992) but regionally can vary from 35-90%.<sup>5</sup> The WHO has developed cut off criteria to define the severity of iodine deficiency as a public health program as shown in Table 12. It can be seen that Mali has a severe problem with iodine deficiency.

<sup>4</sup> These data give extremely high estimates of vitamin A deficiency and pathological xerophthalmia. Sample sizes are small and may not accurately reflect populations

<sup>5</sup> In the past UNICEF's microelement nutrition project has identified areas in need of iodine supplementation (UNICEF, 1994)

**Table 12 : Cut off points defining iodine deficiency as a public health problem**

| <b>Severity of public health problem</b> | <b>% prevalence (total goiter rate)</b> |
|--|---|
| Mild                                     | 5-19.9%                                 |
| Moderate                                 | 20-29.9%                                |
| Severe                                   | >30%                                    |

(WHO, 1996a)

UNICEF (1997) estimates that 20% of Mali's salt is iodized. However Coulibaly *et al.* (1996) found that consumption of iodized salt is not widespread in Mali and, as a rule, locally produced salt is not iodized. Iodized salt can be purchased in the big cities but is difficult to obtain in rural areas. Table 13 gives details of the different types of salt used by Malian households by region.

**Table 13 : Percentage household usage of different types of salt by region**

|                        | <b>Type of Salt Used</b> |         |      |             |       |
|------------------------|--------------------------|---------|------|-------------|-------|
| <b>Region</b>          | Sea                      | Iodized | Rock | Non iodized | Other |
| Kayes                  | 0.6                      | 0.3     | 0.7  | 98.4        | 0.0   |
| Koulikoro              | 7.4                      | 0.6     | 10.2 | 81.7        | 0.2   |
| Sikasso                | 3.7                      | 0.7     | 0.2  | 94.6        | 0.8   |
| Segou                  | 0.0                      | 0.5     | 0.3  | 99.0        | 0.3   |
| Mopti                  | 0.0                      | 0.3     | 1.4  | 97.9        | 0.4   |
| Tombouctou /Gao (urb.) | 0.2                      | ' 0.1   | 63.9 | 35.8        | 0.0   |
| Bamako                 | 25.5                     | 6.7     | 0.3  | 66.6        | 1.0   |

EDSM-11 Mali, 1995-96 (Coulibaly *et al.*, 1996)

#### *2.4.3 Iron deficiency*

Few data are available concerning the prevalence of anemia in Mali (Ministere de la Sante, 1992). A survey in 1981 found that 86% of the population had a hemoglobin level less than 120g/l (mild anemia) whilst 10% had a hemoglobin level less than 100g/l (moderate anemia)(K.B.K. project cited by Ministere de la Sante, 1992).

Regional estimates of anemia in West Africa suggest that the anemia is likely to be highly prevalent among school age children living in Mali. DeMayer and Adiels-Tegman (1985) estimated that in West Africa, 55% of 6-12 year old children, 43% of adolescent boys and 44% of adolescent girls had a hemoglobin level less than 120g/l.

WHO has developed cut off points to define the severity of anemia as a public health problem within a country (Table 14). It is almost certain that anemia in Mali is a public health problem of the highest severity.

**Table 14 : Cut off points defining anemia as a public health problem**

| <b>Severity of public health problem</b> | <b>% prevalence anemia</b> |
|--|----------------------------|
| low                                      | < 15                       |
| medium                                   | 15-40                      |
| high                                     | >40                        |

\* hemoglobin<115g/l (5-11 year olds), <120 g/l 12-14 year olds  
(WHO, 1996b)

A hospital based study of hemoglobinopathies amongst 236 children suffering from malaria (Doumbo et. al., 1992) found that 21.2% were carriers of hemoglobin S. A survey of 3,473 individuals in the Dogon country found that HbC traits and HbS traits accounted for 1.5% and 3% of the sample respectively (Ducrocq et al., 1994).

#### *2.4.4 Protein energy malnutrition*

Protein energy malnutrition is a continuing and serious problem in Mali. In previous years, the mean nutritional intake of the population has been 2251 calories per person per day, only 92% of the minimum intake agreed by the WHO and FAO of 2450 calories per day (Traore et al., 1994)

Most studies of protein energy malnutrition in Mali have occurred amongst children aged less than six years old. However, a national study of malnutrition conducted in 1988/89 (Enquête Budget Consommation cited by Chauliac, 1995) found that of children aged six to 10 years 9.8% were of weight for height less than -2 z scores of N.C.H.S. standards while 17.7% were of height for age less than -2 z scores of standards. Levels of malnutrition amongst Malian children of all ages found by different surveys are shown in table 15.

**Table 15 : Anthropometrics of children -- percentage wasted and stunted**

|            | 1987 (a)<br>Children aged 0-10<br>years |         | 1994 (b)<br>Children aged 0-5<br>years |         | 1995/96 (c)<br>Children aged 0-3<br>years |         |
|------------|---|---------|--|---------|---|---------|
|            | Wasted                                  | Stunted | Wasted                                 | Stunted | Wasted                                    | Stunted |
| Kayes      | 15.2                                    | 18.4    | 38.0                                   | 28.0    | 17.0                                      | 34.0    |
| Koulikoro  | 11.1                                    | 27.3    | 13.2                                   | 40.6    | 24.0                                      | 31.0    |
| Sikasso    | 12.2                                    | 26.5    | 7.3                                    | 47.9    | 25.0                                      | 33.0    |
| Segou      | 10.8                                    | 21.7    | 8.4                                    | 31.1    | 22.0                                      | 33.0    |
| Mopti      | 11.0                                    | 22.8    | 13.4                                   | 44.0    | 27.0                                      | 28.0    |
| Tombouctou | 10.8                                    | 26.2    | 26.3                                   | 16.5    | 26.0                                      | 30.0    |
| Gao        | 13.8                                    | 31.0    | 26.1                                   | 29.6    | 26.0                                      | 30.0    |
| Bamako     | 8.8                                     | 20.9    | 15.3                                   | 24.7    | 28.0                                      | 17.0    |

(a) Enquête Budget Consommation cited by Chauliac, 1995

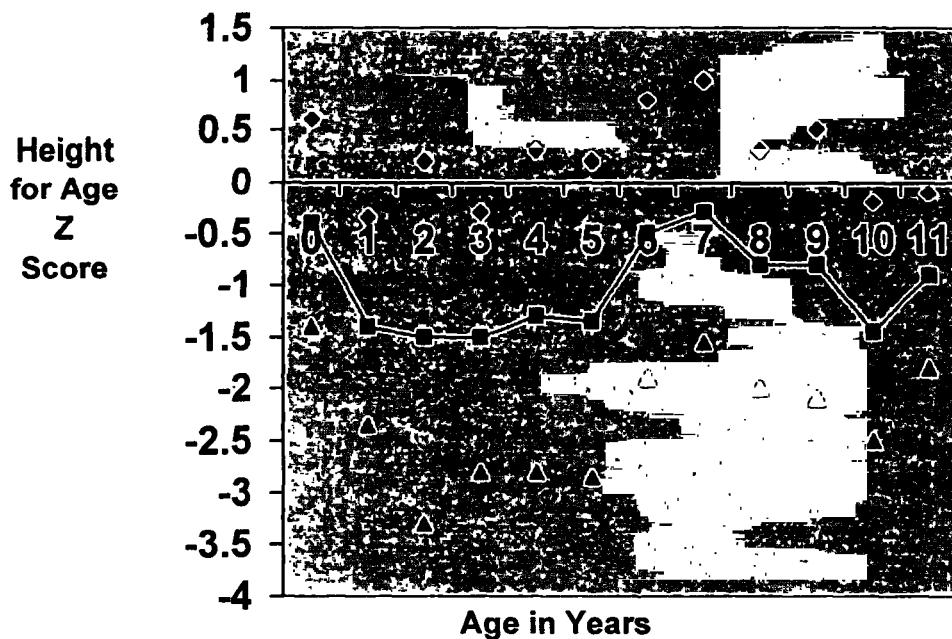
(b) Enquête Malienne de Conjoncture Economique et Sociale cited by Chauliac, 1995

(c) Mali DHS Survey, 1996 (data from this survey may not be accurate and is to be reanalysed)

The level of malnutrition endured by Malian children tends to be seasonal being lower September to March and elevated during the pre-harvest period of June to September (Ministere de la Sante, 1992). Anthropometrics studies in the Niger delta showed that malnutrition of this pattern exists among school aged children. In the area, 5-11 year old children of the Fulani ethnic group were particularly at risk of malnutrition at the period of the end of the rainy season with 22% of girls being less than 80% of weight for height standards in October and 11 % of boys being below that cut off in September (Wagenaar-Brouwer, 1985).

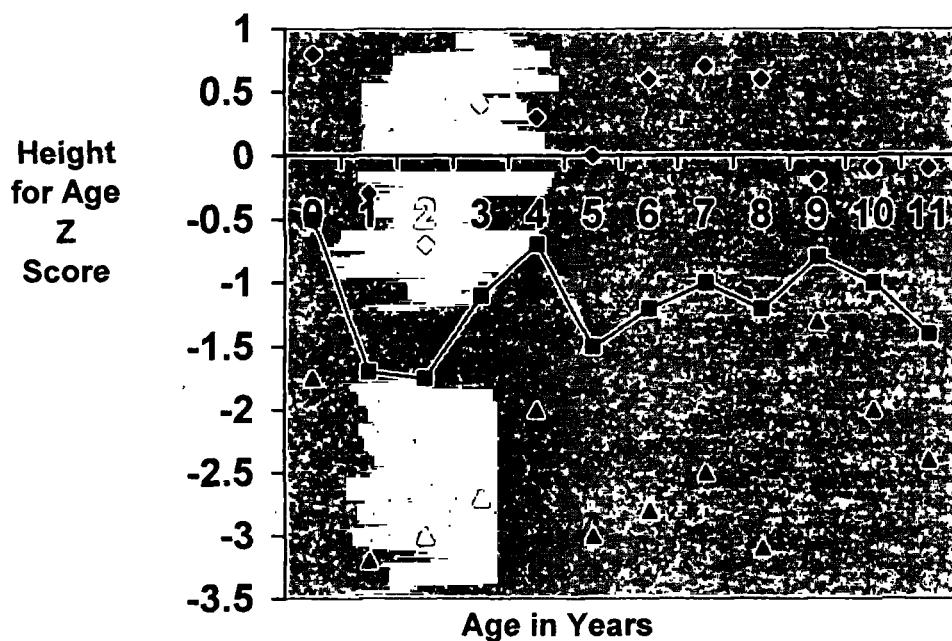
Data from Sikasso region (Dettwyler, 1991) suggests that Malian school age children do not experience 'catch up' growth following growth deficits experienced in early childhood<sup>6</sup>. (Figures 5a and 5b) Nutrition and health interventions delivered during the school years could reverse the trend observed.

**Figure 5a : Mean height for age Z scores (+/- 1 s.d.) of boys living in Sikasso**



<sup>6</sup> Care should be taken in interpreting this data since the sample size of boys and girls was small (N=575).

**Figure 5b : Mean height for age Z scores (+/- 1 s.d.) of girls living in Sikasso**



#### *2.4.5 Data required concerning nutritional deficiencies*

More information is required for school age children by sex, region and season of incidence of the following:

- Vitamin A, iodine, iron deficiency. In particular, very little data has been found to give even an indication of the scale of nutritional anemia
- anthropometrics indices (height for age and weight for height) and other measures of nutritional status
- the extent of short term hunger

### **2.5 Non-communicable Disease**

#### *2.5.1 Blindness*

A community based cross sectional study of the prevalence and causes of blindness among 5871 people in Segou region in 1990 (Chortling et al., 1996) found that the overall prevalence of blindness was 1.7% with the prevalence amongst school aged children (5-14 years) in the range of 0.1-0.2%. Likely causes of blindness amongst young people included trachoma (infection), glaucoma and xerophthalmia (vitamin A deficiency).

#### *2.5.2 Data required concerning non communicable diseases*

Information is required by age, sex, region and season of incidence of the following:

- Hearing and sight impairment
- Dental problems
- Chronic disability and mental illness
- Violence, accidents and dependency on alcohol, tobacco and drugs

## ***2.6 Social and Cultural Factors as Health Determinants***

Information is needed concerning the relationship of current societal values and norms to nutrition and health problems facing Malian school aged children. Such information is important to the design of programs, especially with regard to the health of girls.

### **3. The School and Adolescence**

A large proportion of school aged children are adolescents and therefore issues such as sexuality, reproductive health and HIV/AIDS/STDs have a significant impact on their health and welfare.

#### **3.1 Sexuality**

Important issues relating to adolescent sexuality include early involvement in sexual activity with attendant risk of STD/HIV infection, unwanted pregnancies and high mortality both of child mothers and their offspring.

#### **3.2 Family Planning**

Use of contraception is extremely limited in Mali with only 8% of women and 18% of men using any method, either modern or traditional (Coulibaly *et al.*, 1996). Table 16 shows that usage is low amongst young women suggesting that girls who are sexually active at school run a high risk of becoming pregnant. Usage amongst youths is higher with 7.2% of men aged 15-19 years and 23.2% of men aged 20-24 years reporting usage of a modern contraceptive respectively (USAID, 1997). Usage rates amongst men and women out of union (and sexually active) are substantially higher than for those within a union (Table 17). Poor quality patient-provider interaction in health service delivery points is a major constraint on contraceptive service use by young adults (CERPOD cited by USAID, 1997).

**Table 16: Use of contraception among 15-24 year old women**

|       | % Usage |        |                     |
|-------|---------|--------|---------------------|
| Age   | None    | Modern | Traditional/Popular |
| 15-19 | 93.1    | 3.2    | 3.7                 |
| 20-24 | 90.5    | 5.5    | 4.0                 |

EDSM-11 Mali, 1995-96 (Coulibaly *et al.*, 1996)

**Table 17: Use of contraception among 15-24 year old men and women out of union and sexually active**

|       | % Usage |       |
|-------|---------|-------|
| Age   | Men     | Women |
| 15-19 | 37.1    | 15.7  |
| 20-24 | 44.4    | 44.8  |

#### **3.3. HIV/AIDS/STDs**

A survey conducted in 1992 investigated the prevalence of HIV infection in Mali (Table 18). Epidemiological analysis in other countries such as Uganda has found that children aged 5-15 years old are relatively 'HIV free' whilst infections do occur amongst older adolescents. It has been found that a proportion of older Malian adolescents is sexually active and is becoming infected with STDs (Table 19). Unless such children experience change in their behavior, the

prevalence of HIV infection in this age group will increase. Education of younger children concerning HIV could be a powerful means of reducing the spread of infection in the country<sup>7</sup>. It is clear though that many children in Mali are not learning about the risks of infection with STDs, knowledge of STDs other than AIDS being very poor (Table 20).

**Table 18: Prevalence of HIV infection by region and sex amongst Malians aged 15 years and above**

| <b>Region</b> | <b>Men</b> |                       | <b>Women</b> |                       |
|---------------|------------|-----------------------|--------------|-----------------------|
|               | <b>N</b>   | <b>% seropositive</b> | <b>N</b>     | <b>% seropositive</b> |
| Kayes         | 353        | 1.3                   | 617          | 3.2                   |
| Koulikoro     | 238        | 2.9                   | 602          | 4.3                   |
| Sikasso       | 295        | 5.4                   | 389          | 5.1 I                 |
| Segou         | 232        | 1.7                   | 534          | 1.8                   |
| Mopti         | 413        | 2.4                   | 571          | 3.5                   |
| Tombouctou    | 118        | 0.8                   | 130          | 1.5                   |
| Gao           | 75         | 1.3                   | 147          | 2.0                   |
| Bamako        | 102        | 1.9                   | 510          | 3.7                   |

(Ministere de la Sante, de la Solidarite et des Personnes Agees, 1996).

**Table 19: Percentage Prevalence of incidence of STDs amongst 15-19 year olds during a 12 month period (all regions)**

|         | <b>N</b> | <b>Any STD</b> | <b>Syphilis</b> | <b>Gonorrhea</b> | <b>Discharge from penis</b> | <b>Genital ulcer</b> | <b>Other</b> |
|---------|----------|----------------|-----------------|------------------|-----------------------------|----------------------|--------------|
| Men     | 162      | 6.0            | 0.6             | 0.6              | 5.4                         | 3.2                  | 0.0          |
| Vv'omen | 621      | 1.2            | 0.2             | 0.2              | -                           | -                    | 0.8          |

EDSM-11 Mali, 199-96 (Coulibaly et al., 1996)

**Table 20: Knowledge of STDs among 15-19 year olds<sup>8</sup>**

|       | <b>N</b> | <b>Knew of no STD</b> | <b>Syphilis</b> | <b>Gonorrhea</b> | <b>AIDS</b> | <b>Condylome/ Genital warts</b> | <b>Other</b> |
|-------|----------|-----------------------|-----------------|------------------|-------------|---------------------------------|--------------|
| Men   | 441      | 35.0                  | 8.5             | 15.0             | 61.4        | 0.0                             | 3.0          |
| Women | 1883     | 53.5                  | 6.1             | 8.6              | 44.3        | 1.3                             | 2.0          |

EDSM-11 Mali, 1995-96 (Coulibaly et al., 1996)

### **3.4. Teenage Pregnancy**

A comprehensive study of teenage pregnancy and child health conducted in Bamako in the early 1980s (LeGrand and Mbacke, 1993) found that 9% of 12009 live births were to mothers aged less

<sup>7</sup> Of particular interest to the needs of the school age child, UNICEF is running a large IEC programme to combat AIDS which is focused on school children and also those out of school. Other NGOs participating in attempts to halt the spread of AIDS include the Groupe Pivot, Save the Children UK and Care international

<sup>8</sup> When questioned further, 89.6% of boys and 79.8% of girls said that they knew about AIDS or had heard talk of AIDS.

than 18 years and 21 % to mothers aged less than 20 years. When compared with pregnancies amongst older women, teenage pregnancies were associated with significantly worse prenatal health care and vaccination behavior, lower birth weights, earlier weaning, and, especially during the second year of life, higher mortality. When compared with other pregnant women of the same age, pregnant school girls were less likely to seek prenatal medical care, especially early on in pregnancies, and were less likely to have their child vaccinated for DPT. Children born to school girls weighed less at birth than those born to others.

### ***3.5. Antenatal Vaccination of Women***

Coverage of tetanus vaccination varies widely across the country being higher in urban areas than rural areas. Table 21 gives details of national and some regional levels of tetanus vaccination. No data were found concerning rubella vaccination.

**Table 21: Tetanus vaccination amongst women**

|            | <b>% of women vaccinated</b> |
|------------|------------------------------|
| Mail       | 18                           |
| Bamako     | 55                           |
| Tombouctou | 9                            |
| Kaves      | 12                           |

(Ministere de l'Education de Base, 1994)

### ***3.6. Data Required Concerning School-age Children and Adolescence***

Information is required by age, sex, region and season of incidence of the following:

- Early pregnancy, reproductive health (sexually transmitted diseases, HIV/AIDS, reproductive tract infections, menstrual health) and tetanus among young adolescents
- Data on rubella and tetanus vaccination amongst school age girls

## 4. The School and Health Care

### 4.1 Health Education Curriculum

Elements of health education are contained in the curricula for science and domestic science from the third year of schooling onwards (see Table 22). Some basic education concerning personal hygiene and deportment is included in Civics and Morality from the first year onwards. The extent to which health education included in the curriculum is taught in practice is not known.

**Table 22: Components of health education contained within the school curriculum**

| Year of schooling | Subject   |  |
|-------------------|---|--|
| Domestic Science  | Science   |  |
| 3 <sup>rd</sup>   | Nutrition - identification of different types of food<br>Maintenance of toilets   |  |
| 4 <sup>th</sup>   | As 3 <sup>rd</sup> year   | Hygiene of the mouth, teeth, nose, skin, eyes and ears; Care of skin diseases (ringworm, scabies) and wounds; Effects of flies and mosquitoes; The importance of clean drinking water and food hygiene |
| 5 <sup>th</sup>   | Classification of different foods; Food quality. Balanced diet; Different cooking methods; Boiling water<br>Control of flies, mosquitoes and cockroaches. | Nutrition - fats, sugars and carbohydrates; Food hygiene; Disease- diarrhea, measles, meningitis, whooping cough, polio, malaria, AIDS   |
| 6 <sup>th</sup>   | As 5 <sup>th</sup> year   | Disease - tuberculosis, diphtheria, bilharzias; Control of microbial infections, use of antiseptics and antibiotics  |

(Ministere d' Education de Base, 1994a)

A number of agencies including UNICEF and NGOs have experience in the development and use of health education materials in Mali. UNICEF has developed materials in local languages and also has some experience with 'Child to child' materials (UNICEF, 1994).

#### **4.2 School Feeding**

Few primary schools have facilities for school feeding. Table 23 gives the number of school canteens and the number of children served by region (Ministere de l'Education de Base, 1996). Increased provision of school canteens has been identified by the Malian administration as a possible means of increasing girls' enrolment. The team preparing the ten year plan for development of education has suggested community implementation of school canteens and the introduction of payment for meals (Commisariat au Plan, 1997).

**Table 23: Distribution of school canteens in Mali**

| <b>Region</b> | <b>Number of Canteens</b> | <b>Nombre de pensionnaires</b> |
|---------------|---------------------------|--------------------------------|
| Kayes         | 16                        | 1397                           |
| Koulikoro     | 1                         | 160                            |
| Sikasso       | 5                         | 248                            |
| Segou         | 3                         | 421                            |
| Mopti         | 10                        | 1171                           |
| Tombouctou    | 76                        | 13166                          |
| Gao           | 27                        | 4072                           |
| Bamako        | 10                        | 785                            |
| Kidal         | 7                         | 698                            |
| Total         | 155                       | 22118                          |

(Ministere de l'Education de Base, 1996)

A survey of 494 second and sixth form primary school children enrolled in schools or Muslim colleges in Bamako in 1993 found that children were given money by their parents and families to buy food during the week and hence were highly independent consumers (Chauliac et al., 1994). The money spent was not trivial, the mean sum per child being about 10% of the mean daily food costs of a Bamako family. Children used the money to buy a wide range of foodstuffs; drinks, ices, ground nuts, fruit, cooked meals, uncooked meals and sweets. Strategies targeted at urban children to help them improve their food choices could have a favorable effect on their nutrition.

#### **4.3 The School Environment**

Information is needed concerning the provision of sanitary facilities and clean water in Malian schools. In general, the provision of water and sanitation in Mali is poor. UNICEF (1997) estimates that only 49% of the population has safe drinking water available in the home or within a reasonable distance (1991-93 data) whilst the proportion of the population having adequate facilities for the disposal of excreta is 21.2% (1983-85 data).

A study by the National Directorate of Public Hygiene and Sanitation of 18000 households in ten urban agglomerations (cited by Diarra, 1991) found that 96% possessed sanitary infrastructure of which 85% had a simple pit latrine, 9% a latrine with a water tight seal and 6% septic tanks. In rural areas, only 26% of the rural population is estimated to have access to latrines with one in five villages having no excreta disposal facilities at all (Ministere de la Sante, de Solidarite et des Persons Agees).

The lack of adequate sanitary facilities at schools has been recognized within Mali to be one of the causes of low girls' enrolment (Commisariat au Plan, 1997) and plans are being developed to encourage community construction of latrines within schools.

Some activities are occurring to improve the school environment. School latrines have been built by the Projet Education a l'Hygiene et Assainissement (UNICEF, 1994b) which works in 606 villages in six districts of Mopti region.

## 5. Schools as a Means of Reaching School-age Children

### 5.1 Comparative Coverage of Schools and Health Facilities in Mali

The number of primary schools far exceeds that of health facilities and hence programs which deliver interventions through the education system will achieve much wider coverage than would be achieved by delivery through the health sector. Comparative numbers of health facilities and public primary schools by region are shown in Table 24.

**Table 24: Comparative numbers of schools and health facilities in Mali 1996/97**

| Region    | CSCOM<br>crees | CSA<br>revitalise | SSSC | National<br>hospital | Regional<br>hospital | S'dary<br>hospital | Public<br>primary<br>schools |
|-----------|----------------|-------------------|------|----------------------|----------------------|--------------------|------------------------------|
| Kayes     | 17             | 10                | 7    | 0                    | 1                    | 1                  | 231                          |
| Koulikoro | 13             | 15                | 7    | 1                    | 0                    | 0                  | 374                          |
| Sikasso   | 17             | 12                | 8    | 0                    | 1                    | 0                  | 297                          |
| Segou     | 23             | 21                | 7    | 0                    | 1                    | 2                  | 213                          |
| Mopti     | 13             | 21                | 8    | 0                    | 1                    | 0                  | 175                          |
| T'bouctou | ND             | ND                | 5    | 0                    | 1                    | 1                  | 73                           |
| Gao/Kidal | ND             | ND                | S    | 0                    | 1                    | 0                  | 92                           |
| Bamako    | 26             | 0                 | 6    | 2                    | 0                    | 0                  | 201                          |

(Secteur de la same, 1997)

### 5.2 Enrollment

Primary school enrolment in Mali is amongst the lowest in the world. In 1996/97, gross enrolment in primary schools, including medersas (French-Arabic schools registered with the Ministry of Basic Education) was 46.1%. Gross enrolment of girls was 38.4%.

Some 12060 girls attended Save the Children community schools not counted in national statistics. Enrolment of girls in all community schools makes up 6% of gross enrolment, taking into account the Save the Children data. Community schools have equity criteria in enrolment and have been a major cause of increased girls enrolment (USAID, 1997).

Table 25 shows that enrolment in the regions occurs at a much lower level than in Bamako. School based health programs will help to enhance enrolment, and should be designed in concert with strategies to achieve universal primary education. A major consideration of any proposed program will also be to deliver health or nutrition interventions through schools will be how to reach out to non enrolled children.

**Table 25: School enrolment by region (1991-1992)**

| Region     | % Enrolment Boys | % Enrolment Girls | % Enrolment Total |
|------------|------------------|-------------------|-------------------|
| Kayes      | 27.43            | 13.04             | 20.23             |
| Koulikoro  | 35.23            | 18.31             | 26.77             |
| Sikasso    | 30.24            | 14.74             | 22.49             |
| Segou      | 28.26            | 15.23             | 21.74             |
| Mopti      | 21.31            | 12.19             | 16.75             |
| Tombouctou | 19.86            | 13.04             | 16.45             |
| Gao        | 26.60            | 16.10             | 21.35             |
| Bamako     | 79.86            | 58.76             | 69.31             |

(Ministere de l'Education de Base, 1994b)

### **5.3 Education of Girls**

In Mali, education of girls is inhibited by a number of factors; socio-cultural, economic, educational and legal (Ministere d'Education de Base, 1994b). Sheer lack of schools and refusal of parents to send their daughters to school are two of the primary causes of non enrolment of girls (LTNDP/L7NESC0, 1993). Socio-cultural norms view women as mothers and housewives and parents are often hostile to education that is perceived to cause girls to have ambitions for other roles. School attendance by girls is also often perceived by parents to be at the wasteful expense of their ability to work and where money is limited, sons are more likely to be given the opportunity to gain an education than daughters. Education in general is often poorly prized by parents, perhaps reflecting their perception of its quality.

Until recently, girls who became pregnant were excluded from school. However there has been a change in the law allowing pregnant girls to remain at school (Ministere d'Education de Base, 1994b), although it is not known how well this works in practice.

During the past several years, the primary school expansion project funded by a number of donors including the World Bank has included components to increase the enrolment of girls<sup>9</sup>.

Table 26 gives information about the reasons for primary school drop out given by Malian women aged between 15 and 24 years. The data show that health issues are seldom primary causes of dropout. However, identifying ways to reduce absenteeism is critical if girls are to receive schooling and be accessible to school-based nutrition and health services.

**Table 26: Causes of primary school dropout cited by women aged 15-24 years**

| Reason for Dropout | % Girls |
|--------------------|---------|
| Pregnancy          | 0.8     |
| Marriage           | 8.7     |
| Child minding      | 2.9     |

<sup>9</sup> Extensive information concerning girls' enrolment is given in legal Ministere d'Education de Base (I 994a) and UNDP/UNESCO (1993).

|                       |      |
|-----------------------|------|
| Working for family    | 13.4 |
| Unable to pay fees    | 3.3  |
| Need money            | 1.7  |
| Sufficiently educated | 0.0  |
| Failure to progress   | 10.7 |
| Dislike of school     | 38.8 |
| School inaccessible   | 3.6  |
| Other                 | 7.1  |
| Not known             | 8.9  |

EDSM-II Mali, 1995-96 (Coulibaly et al., 1996)

#### ***5.4 Laws and Policies Relevant to School-age Children***

Information is needed concerning laws and policies relevant to school age children including laws on sexual harassment by teachers, laws on limiting youth access to tobacco and alcohol and also policies on sex education. Information on both the scope and the implementation in practice of laws and policies is required.

## 6. Nongovernmental Organizations in Mali

A considerable number of NGOs work within Mali in a wide variety of sectors. A survey of NGOs with varying degrees of activity in the sectors of health, education and nutrition is given below in table 27.

**Table 27: A survey of NGOs working within Mali with activities relating to health, education and nutrition**

| NGO             | Activities  |  | Regions  |
|-----------------|---|--|--|
|                 | <i>Competances</i>  | <i>Experiences</i>   |  |
| OGES            | Primary health care<br><i>Development de constructions sans lois</i>                                      | Primary health care<br><i>Development de constructions sans lois</i> | Mopti  |
| LACIM           | All sorts of activities required by villages  |  | Mopti, Kidal, Tombouctou, Bamako, Koulikoro, Sikasso |
| NEF             | <i>GRN, Amenagement, Credit, Literacy campaigns</i>   | <i>GRN, Credit, Literacy</i>   | Mopti  |
| TASSAGHT        | Support to women artisans, Literacy, Support for school canteens  | Traditional crafts, Training   | Gao  |
| SEAD            | Training, Literacy, Support to village collectives  | Food security, Studies and Training                                  | Gao  |
| CARE            | Water, Health, Literacy, Agriculture, Sanitation, Emergency, School rehabilitation, Gardening, <i>GRN</i> | Support, Primary health care, Emergency, <i>GRN</i>                  | Segou, Tombouctou, Mopti                             |
| YERE DEME/ MALI | Agriculture, Husbandry, Fishing, Education, Health, Credit-Savings, Training support                      | Training, Support  | Segou, Tombouctou, Mopti                             |
| GARI            | Credit, <i>GRN</i> , Cereal banks, Food aid Literacy  | <i>GRN, Credit</i>   | Gao  |
| VISION MONDIALE | Food security, reforestation, health,   | Food security, health  | Gao  |

|              |   |  |   |
|--------------|---|--|---|
|              | literacy, gardening, irrigation   |  |   |
| OXFAM-UK     | Finance of partners, support, training  | Finance, training, Institution strengthening   | Koulikoro, Mopti, Gao, Bamako                             |
| ARAFD        | Literacy, Credit-savings, Civic and health education, management training, Community development  | Credit-savings, Literacy   | Bamako, Mopti, Sikasso                                    |
| USC (CANADA) | Support of NGOs and Community organizations   | <i>Financement des conseils</i> , Technical support, Institutional support, Training           | Mopti, Bamako, Tombouctou, Koulikoro, Segou               |
| Baara Nyuman | Agriculture, <i>Elevage</i> , Health, Education, Craft industry, Water and forestry   | Credit-savings, PF/STDs/AIDS   | Bamako, Kayes (Kita)                                      |
| GUAMINA      | Protection of the environment, PME, Credit-savings, Water sanitation, training, health, appropriate technology, promotion of women, studies, research | Protection of the environment, PME, Training   | Bamako, Segou, Mopti, Kayes, Gao                          |
| OMAES        | Village water, Credit-savings, food aid, micro-enterprise, Hygiene and sanitation   | Emergency/ Rehabilitation, Education and health, infrastructure, community animation, literacy | Tombouctou (Dire, Niafunke, Goudam), Mopti, Bamako, Segou |
| ADAF/GALLS   | Revenue generating activities, appropriate technology, maternal and child health  | Credit-savings, Gardening, Processing, Training  | Koulikoro, Kayes  |
| AMRAD        | Research, action, training, support of local initiatives  | Husbandry, Water, Health, Animation, Training  | Tombouctou, Mopti, Koulikoro, Bamako, Segou, Kayes        |
| CECI         | Support of NGOs, Support of   | Food processing, Water, Training,  | Bamako, Mopti, Sikasso, Kayes                             |

|  |   |  |  |
|--|---|--|--|
|  | community organisations,<br>Support of <i>filiere agro- alimentaires</i> ,<br>GRN, Community health, Human rights education | Education, Human rights education, Support of NGOs.  | <i>Prevision:</i> Kayes, Segou, Bougouni |
| WORLD EDUCATION  | Education, Urban Projects, Micro enterprise   | Education, Sanitation, Community animation, Micro-enterprise, Institutional reinforcement  | Bamako, Koulikoro, Sikasso               |
| AFRICARE   | Community Health, Agricultural production, Water  | Community health, Hydro-agricultural, GRN, development, Village water, Credit-savings  | Tombouctou, Segou                        |
| GROUPS PIVOT EDUCATION DE BASE                           | Knowledge of formal and non formal education  | Animation and support of coordination, Organization/production of information, training, sensitization, Recherche de partenaires | All Mali                                 |
| GROUPS PIVOTS SURVIE ENFANT PLANNING FAMILIAL PREVENTION | Studies, community health, family planning, prevention  | Inquiry, Information, Animation, Sensitization, Health education, prevention, coordination, vaccination, nutrition               | Sikasso, Segou, Gao, Mopti, Koulikoro    |
| AED  | Agriculture, Revenue generating activities, fish farming, literacy  | Revenue generating activities  | Koulikoro, Segou, Sikasso                |
| AES  | Management of natural resources, Water provision, Community health, Education   | Conservation of water and soil   | Koulikoro, Segou                         |

|                       |  |  |                                       |
|-----------------------|--|--|---------------------------------------|
| AMAPROS               | Agro-pastoralism, Promotion of women, Education and health, Literacy                       | Agro-pastoralism   | Koulikoro, Kayes, Sikasso, Mopti      |
| AFOB                  | Micro-enterprise, Training, Health, Credit-savings   | Credit-savings   | Bamako                                |
| GRAT                  | Technological research, Agriculture, Sylviculture, Apiculture, Water, Health, Education    | Appropriate technology   | Bamako, Koulikoro, Sikasso            |
| KILABO                | Agriculture, Husbandry of small ruminants, Village water, Literacy, Health, Credit-savings | Agriculture and husbandry                                      | Koulikoro, Sikasso                    |
| JIGI                  | Health, Education, Sanitation  | Sanitation   | Bamako, Town of Niono, Sikasso        |
| SIGHT SAVERS          | Onchocerchiasis, Cataract operations, Care of the blind                                    | Care of the blind  | Koulikoro, Sikasso, Kayes, Tombouctou |
| GRADE BANLIEUE        | Education, Environment, Health   | Education  | Bamako, Koulikoro, Mopti -Kayes       |
| SAVE THE CHILDREN U.S | Community Schools  | Technical support, Education, Health                           |                                       |
| SAVE THE CHILDREN UK  | Food security, health  | Cereal bank, village shops, literacy, credit, community health | Mopti (4 districts, 38 villages)      |

(Doumbia et al., 1995)

## **7. Assessing the Capacity to Promote and Implement Programmes**

Few data have been found outside Mali concerning not only existing school health programs but also the general health services to which school age children have access. Information on the availability of resources will be important in assessing local resource capacity and response. The present guidelines should be read in conjunction with the Partnership for Child Development situation analysis tool. Basic topics that need to be covered include:

- The relative responsibilities of the health and education sectors for school nutrition and health education and services
- National and regional policies bearing on school nutrition and health programs - their relevance and the extent to which they are open for review
- The structure, personnel qualifications, components and coverage of any **existing school nutrition and health programs**, including the customary health screening and first aid programs
- Current approaches to health education, including family life and reproductive health education and other nutrition and health related activities such as school health clubs
- Current use of primary health care facilities by the school-age group, including use of reproductive health facilities and referrals between schools and the primary health care system
- The extent to which school-age children use private health services and traditional healers
- The content, coverage, effectiveness, and cost of school feeding programs and school gardens
- Information on school canteens and local food vendors who serve schools
- Information on school water supply and sanitary and waste disposal facilities
- The contribution of NGOs and intergovernmental organizations to school programs
- The community's contribution to schools and to the provision of clean water and good sanitation facilities, school feeding, and other nutrition and health services
- Current levels of investment by government or other agencies in the health and nutrition of school-age children
- Preschool and special education programming

It will be necessary to project the availability of resources and the technical and institutional capacity for these purposes.

- Information is needed concerning the relative strengths and weakness of lead agencies and other participating organizations in school health and nutrition programs
- An important task will be to determine the capacity of the education sector to help deliver nutrition and health services. Information required includes:
  - The context of existing nutrition and health education in schools, including focus, methods, materials, and an overview of relevant curriculums currently being explored or implemented
  - The capacity of teacher training institutions to provide training in nutrition and health, including the frequency and coverage of in-service training for teachers
  - The contribution of religious organizations and other NGOs to the education sector and their capacity to help deliver nutrition and health education and services

- The contribution of intergovernmental organizations to school nutrition and health programs
- The willingness and capacity of government, other agencies in the education sector, and communities to invest in nutrition and health education and services
- The capacity of the school environment to support health promotion, including the availability at school of clean water and of facilities for menstruating girls

## **8. Conclusions**

### ***8.1 Demographic Characteristics of the School-age Population***

School age children make up 37% of the population of Mali. Despite their large numbers, little is known about their health and nutrition. Mali's socioeconomic indicators are poor: for example, infant and child mortality rates are high. GNP is low. In consequence, school age children, in common with many groups in Malian society will be expected to suffer high rates of mortality and morbidity.

### ***8.2 Infectious Disease***

**Worms:** Varying by region, schistosomiasis is commonly found in many parts of the country (30%) as is hookworm (8%). *A. lumbricoides* and *T. trichiura* appear to be rare while the prevalence of cestodes is uncertain. Dracunculiasis may affect large numbers of school children. Onchocerciasis is found in the South West of the country. These last two infections are already the subjects of wide ranging control efforts. More data is needed concerning prevalence and intensity of hookworm in different parts of the country.

WHO cut off points suggest that mass treatment of school aged children for schistosomiasis should occur in all parts of the country. Because of the predominance of urinary schistosomiasis, a questionnaire approach to allow targeting of treatment could be used. Given the prevalence of malnutrition and anemia, mass treatment of school age children for hookworm using targeting at the school level would be worthwhile.

***Malaria:*** National figures estimate that malaria is responsible for a considerable proportion of mortality (32%) and morbidity (31%) experienced in Mali. It is likely to be a considerable problem for school age children but data concerning its epidemiology are lacking.

Resistance to anti-malarials in Mali is an issue of great concern. A school health initiative should investigate the use of alternative control strategies disseminated from schools such as distribution of insecticide impregnated bed nets.

***Measles and meningitis:*** Available statistics suggest that these infections are a major source of mortality among school age children. More information concerning their epidemiology should be collected as a matter of urgency so that preventive strategies can be formulated. The most effective strategy for control of measles is vaccination at an early age. To achieve this, existing EPI programs should be strengthened.

***Other infections:*** Mortality statistics estimate that acute respiratory infections and intestinal infections are a major cause of mortality. More investigation of these infections amongst school age children are needed. School age children are likely to encounter a wide range of other infections.

### **8.3 Nutritional Deficiencies**

*Vitamin A:* Data from younger children show that vitamin A deficiency is highly prevalent in Mali. The extent to which deficiency affects school age children is not known. Health education materials should be developed to enable children to identify and consume foods rich in vitamin A. Until long term measures are effective in controlling the problem, Vitamin A supplementation of school age children might form part of any school health program established.

*Iodine:* National data show that iodine deficiency is a severe public health problem in the country. Existing programs that aim to increase the coverage of iodized salt in Mali should be supported. Children could be encouraged to consume more iodized salt by provision of iodine testing kits to schools. Until use of iodized salt is more widespread, iodine supplementation of children might be included in school health programs.

*Anemia:* Few data were found concerning the prevalence of anemia. Estimates of prevalence in West Africa suggest that anemia in Mali is likely to be widespread and a severe problem. More information concerning the prevalence and severity of anemia among school age children is required. Interventions to control schistosomiasis, worms and malaria and vitamin A deficiency will help to alleviate anemia but the feasibility of iron supplementation of school age children should also be investigated.

*Protein-energy malnutrition:* This appears too widespread and highly seasonal and there is some evidence of a continuing problem of food security in Mali. More information about the condition amongst school age children is needed. Interventions to control schistosomiasis, worms and malaria will help alleviate malnutrition.

### **8.4 Non-communicable Disease**

More information is required concerning the incidence of disability, violence, accident and trauma amongst school age children.

### **8.5 Adolescent Health**

*Contraception:* Use of contraception is rare in Mali (8% of women and 18% of men). Evidence suggests that low usage is the norm amongst adolescents. Better education concerning contraception and easier access to supplies are needed to encourage family spacing and avoidance of early pregnancy.

*STDs:* In 1992, the prevalence of HIV infection was estimated to be around 3-5%. Prevalence of other STDs among 15-19 year olds is estimated to be 1% for women and 6% for men. Knowledge of STDs amongst adolescents is poor and there is an urgent need to increase awareness of STDs among Malian school age children: early awareness of HIV has been shown in Uganda to be an effective measure in the control of the infection.

Guidance concerning treatment of STDs will also help to halt the spread of HIV: increased treatment of STDs results in decreased HIV transmission.

*Tetanus and Rubella:* Vaccination for tetanus amongst women of child bearing age is uncommon. Data concerning vaccination for rubella are lacking. Vaccination for both infections could be delivered to adolescent girls through schools.

#### ***8.6 Schools and Health***

Elements of health education are included amongst a wide variety of subjects of the curriculum. How much the curriculum translates into practice is not known. The content and coherence of health education could be improved. School feeding programs are available to only a tiny proportion of Mali school children.

#### ***8.7 Schools as a Means of Reaching Children***

Schools cover the country much more widely than hospitals, clinics or dispensaries and are likely to be a much better base from which to reach the school age child. Enrolment though is very low, particularly among girls. School health programs will encourage enrolment and their design should be incorporated in strategies to encourage UPE. Programs designed must also develop strategies to reach out to children out of school.

#### ***8.8 NGOs Operating in Mali***

There are a considerable number of NGOs in Mali, many of which comprise elements of health or education in their work. Further, detailed information is needed about NGOs to learn more about their experience and expertise, particularly in the area of school health.

#### ***8.9 School Health Programmes Existing in Mali***

Little information has been found concerning school health programs already existing in Mali or about school age children's usage of health services. Discussion with the relevant ministries in Mali will provide information in these areas.

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## **Appendix A**

### **Useful contacts concerning health in Mali:**

#### **Demography**

Sara Pacque Margolis 703-760-4958 (home number). Sara is a demographer who worked at USAID/Mali for several years.

MACRO Intl. 301-572-0200 For DHS and other demographic data.

CERPOD. Dr. Mouhamadou Gueye email: [mgueye@cerpod.malinet.ml](mailto:mgueye@cerpod.malinet.ml) Tel: 223-22-30-43 and 223-22-80-86 FAX: 223-22-78-31

#### **Health education**

##### In Mali: (development of materials)

Centre National d'Education et de Communication pour la Sante.

Projet de Communication en Nutrition

##### In USA:

Africare has received money from USAID/Mali for support to community health and community schools. The local contact is Laura Hoemeke, Tel: 202-462-3614.

#### **Adolescent Health**

FOCUS Project (adolescent reproductive health). Contact Barbara Seligman Tel: 202-835-0818, ext 233

Johns Hopkins: Ken Hill (410 955 7816)

#### **Malaria**

Yeya Tiemoko Toure,  
Faculte de Medicine de Pharmacie,  
Universite de Mali,  
BP 1805.  
Bamako  
[yeya@mrtcbko.malinet.ml](mailto:yeya@mrtcbko.malinet.ml)

#### **Wide spread contacts and knowledgeable**

Phyllis Gestrin:  
USAID/AFR/SD/HRD  
1111 N. 19th Street  
Room 300  
Rosslyn, VA 22209

## **Appendix B**

Atlas of the global distribution of schistosomiasis : MALI  
CEGET-CNRS / OMS-WHO - 1987

Urinary and intestinal schistosomiasis (respectively due to *Schistosoma haematobium* and *S. mansoni*), have been recognized in Mali since the beginning of this century. The first report was that of BOUFFARD & NEVEUX in Bamako in 1908 (4). During the last decade various local and regional surveys have demonstrated the extent of their distribution among the population. Both forms of schistosomiasis are ubiquitous south of 17°N latitude, or the southern half of the country. A national schistosomiasis control programme was launched in 1981 (15).

### ***B.1 Population Distribution of S. Haematobium Infection***

Urinary schistosomiasis has been found mainly in the upper reaches of the Niger river and in the upper basin of the Senegal river.

A complete survey of the Kayes region was completed in 1981 (14). The prevalence varies considerably: less than 10% at Fuia, Faragangala, Sandianbougou, Bingassi and Tambafinia, and over 50% at Mayodan and Keniebandi. This high degree of variability has been confirmed by a more recent survey conducted as part of the national schistosomiasis control programme (Yelimane 86%, Diabadji 6%) (15).

In the Bamako region most surveys have been limited to the vicinity of the capital (4, 5, 12, 15), the Koulikoro district and the Kolokani district in the Nossombougou sector (e) and in the Oueouyankro valley (d). The prevalence varied widely such as 85% in Koulikoro, 56.7% in Dogodioumacoura, 58.1 % in Dourako, and 46.7% in Konieba.

In Sikasso region the prevalence rates recorded between 1974 and 1980 in 29 localities surveyed were generally very low : only four of these localities had a prevalence above 10% ; in ten localities the rate was between 5% and 9.9% ; in twelve communities it was between 0.5% and 5% ; and in three localities no schistosomiasis was found. *S. haematobium* infection is also prevalent in the vicinity of Selingue dam and lake.

In Segou region survey data were available from three areas, two downstream from the Markala dam in Ke-Macina district, and in the south of Niono district (15) and another in the sector of San (f). Unlike Selingue the prevalence rates were generally very high, over 60%, except in the sector of San where prevalences were generally less than 50%.

In Mopti region almost all of the communities surveyed were located within the inland delta of the Niger. In two localities out of three prevalence was above 60%, and even reached 100% at Foussi (a). In the Bandiagara region the prevalence is high (80.4% at Kamba-Sinde) or low 10.8% at Sinkarma, 3.3% at Kokolo) (f).

Tombouctou region has also been surveyed for urinary schistosomiasis (15). The prevalences were low (from 5% to 23%) but so far only communities immediately bordering Lake Faguibine and the Niger river between Niafunke and Dire have been investigated. The Niger valley

downstream from Tombouctou, particularly in the vicinity of Gao, has not yet been surveyed. In one locality in Gourma, the plateau region south of Gao, the prevalence was 41.2%(d).

A general review of data and new surveys are currently being undertaken by the Institut National de la Recherche en Sante Publique (INRSP) and the National Schistosomiasis Central Programme (MaliFederal Republic of Germany-GTZ).

### ***B.2 Population Distribution of *S. Mansoni* Infccction***

The distribution of intestinal schistosomiasis is almost as extensive as that of the urinary form. Nevertheless, prevalence is lower in most cases. In Kayes region, of 19 communities surveyed in the national control programme *S. mansoni* infection was absent in eight. Similarly, around Selingue Lake in Sikasso region, *S. mansoni* was not found in 16 communities and among 11 positive communities in only one case was the prevalence more than 5%. Low prevalences of infection have been reported in the Mopti and Tombouctou regions. Conversely, very high prevalences have been found in some communities in the Bamako and Segou regions, i.e. 93 % at Baginedo school, 80% at Kolongotomo. Most of the Bamako, Sikasso, Mopti and Tombouctou regions and the whole of the Gao region have not yet been surveyed.

### ***B.3 Physical Geography of Schistosomiasis***

Mali (1,240,000 km<sup>2</sup>) has a fairly flat relief which has no major hydrographic or climatic consequences. Like all the countries in the sudano-sahelian zone it has high mean annual temperatures (26-30 °C) ; the annual rainfall never exceeds 1,300 mm and mainly occurs between July and September.

The Niger river, the main hydrographic feature of Mali, has an annual flood period which reaches its peak in October/November inundating 20,000 km<sup>2</sup>. During this period an inland "sea" forms from Ke-Macina to Tombouctou ; the river discharge is then around 3,000 m<sup>3</sup>/s. The inland delta of the Niger has an aquatic vegetation which contrasts both with the steppe found to the north of 15°N latitude and with the savanna found south of that parallel. The Senegal river also flows through Mali. It does not have the same influence on the countryside as the Niger, although when in flood (in September) its discharge may reach 2,800 m<sup>3</sup>/s. In the dry season the tributaries, rather than the main rivers, contain numerous residual pools where the snail intermediate hosts are present in large numbers. It seems from the surveys already carried out that the situation is similar in the smaller branches of the inland delta of the Niger. In the upper basins of the Senegal and Niger rivers the presence of onchocerciasis in many gallery forests acts as a deterrent to human settlements and thus reduces the risk of schistosomiasis.

### ***B.4 Human Ecology and Schistosomiasis***

The major watercourses of Mali have long been the scene of hydro-agricultural works. The Markala, Manantali, Selingue, Sotuba and Felou dams are associated with the development of irrigated areas. A programme to create about 50 small reservoirs is in progress (over 30 have already been completed) in the Bandiagara sector on the Dogon plateau.

The rural populations living close to these reservoirs or downstream from the large dams mentioned above generally have a high prevalence of infection. These localities have the highest rural population densities (over 20 inhabitants/km<sup>2</sup>), and agricultural activities require workers' hands to be in frequent contact with water, thereby creating favourable conditions for the spread of schistosomiasis.

The prevalence rates reported in the neighbouring communities of Selingue are low. This may be due to the fact that these tributaries are blackfly breeding places and human-water contacts are more restricted than elsewhere. Nevertheless, the presence of the snail intermediate hosts in the rivers feeding the lake constitutes a potential danger for the recrudescence of schistosomiasis (8).

In the small reservoirs in the Bandiagara sector, infection rates are reported to be higher because the human-water contacts per linear unit of river bank and per unit of water volume are more frequent than around the large lakes. This is also true in the districts where largescale rice-growing is in progress (the Niger Office sectors of Segou, Mopti and Tombouctou) in the Niger flood plain.

The population of Mali is mainly concentrated in the south of the country, in a triangle formed by Bamako, Tombouctou and Sikasso, and in the west around Kayes and Nioro. These populations are subject to extensive periodic migrations. Fishing on the inland delta of the Niger attracts extensive population movements, as does nomadic cattle farming; both these practices increase the possibility of spread of schistosomiasis. For example, in Menaka district, 300 km east of Gao, transmission of schistosomiasis is related to the migratory patterns of nomadic peoples. All the areas along the river Niger may be regarded as potential sites of transmission of schistosomiasis.

**MALI, 2000**



**School Health, Hygiene and Nutrition  
Mali  
Mission Report**

**July 2000**

**Martine Lugat**  
Health and Nutrition Consultant

Prepared for  
Robert Prouty, AFTH2  
Don Bundy, HDNED



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## School Health, Hygiene and Nutrition Sub-Component

### 1. Introduction

Health and education are closely linked. On the one hand, the acquisition of knowledge and skills is a health prerequisite; on the other hand, a healthy student, placed in a safe and stimulating environment will be more likely to succeed in school. Skills-based health education acquired in school before age 14 has long lasting effects on children and adolescents. Girls who received a longer and better education are empowered, have better control over their reproductive life and have children in better health. (Devadas, 1983). Children in good health will also reduce the level of transmission of infectious and parasitic diseases within the community (Bundy et al., 1990). As it was stated in the World Declaration on Education for All (Dakar, April 2000), low enrollment, absenteeism, poor learning results and dropout rates often result from poor health and nutrition.

The Ten Year Program for the Development of Education (PRODEC) of Mali is committed to increase the gross enrollment rate from 50 to 95% by 2010, with girls representing 50% of the enrollment rate and stressed the need for a quality education. By 2004, the primary education repeat rate should drop from 23% to 13% and the dropout rate from 8% to 5%, while in secondary education, the repeat rate should decrease from 20% to 13%.

Over the next decade, the PRODEC plans to implement health and nutrition activities designed to improve and maximize the learning capacity of school children aged 3-17, noticeably those of the girls. The Program, which stresses the need to better support young people and their families against the HIV/AIDS epidemic and to strengthen the women's role in society will be carried out in three successive phases.

### 2. Current Health Status of Pre-School and School Age Children (3-14 years old) in Mali

#### 2.1 Epidemiological data

The under age 5 mortality rate in Mali<sup>1</sup> remains high at 131.1 per thousand in 1995-96 (compared to 144.4 per thousand in 1987-90), with high inequalities between the urban and rural areas (urban: 101.5 per thousand vs. rural 149.2 per thousand). This inequality is also regional : the Under 5 Mortality Rate in Mopti, Ségou, Kayes, and Timbuktu is higher than the national average. The likelihood of death for a child between 1 and 5 years old is 3 times higher if the mother is illiterate and under 20 years old. According to DHS II 57% of the under age 5 deaths are linked to malnutrition.

Infectious and parasitic diseases, particularly malaria, acute respiratory infections, and diarrheas, are frequent in Malian children age 1-14.

- Malaria occurs all year round with an increase in transmission during the rainy season, except in the Northern region.
- The occurrence of urinary schistosomiasis among children aged 7-14 is more than 30% in the irrigated areas of the Office of Niger, Baguineda, near the dams or reservoirs of the Dogon Plateau, Manantali, inside the river Delta, near the Niger and Senegal rivers and around the water points of the Sahel desert<sup>2</sup>. In the Bamako district, the frequency of urinary

<sup>1</sup> Probability of dying between the first and the fifth birthday

<sup>2</sup> Traoré et al., in Class Action WB, 1996

schistosomiasis reported by De Clerq et al<sup>3</sup> among school children age 6-14 is 46.6% among boys and 39.9% among girls. Parasitic diseases are significantly more intense among 10-11 year old children (compared to 6 years old), but not gender related. Children are less affected by intestinal schistosomiasis (2.7%) and other helminthiasis (6.5%) including 8% ankylostomiasis and 0.12% ascariasis. No recent studies, however, are available at the country level.

- 5 to 14 year olds are particularly subject to traumas and burns. This raises the question of home safety and well as safety on the way to school (see Annex 1).
- Skin, mouth and teeth diseases, even though not disabling, could be avoided with better personal hygiene and the monitoring of infectious contact at school or at home (pyoderma, scabies, ringworm etc.).
- Measles and meningitis, easily avoidable with vaccinations, are responsible for numerous deaths among children under 15. The overall immunization coverage<sup>4</sup> within the expanded immunization coverage program is only 31% among children under 2 and 22.8% of children have not received any immunization. Only 50.8% of children have been vaccinated against measles, 39.1% have received 3 doses of anti-polio vaccine 37.5% 3 doses of DTP. 76.3% of children receive the BCG vaccine at birth (DHS II).
- The request for STD screening among the under 15 is probably under estimated at 1.3%. Among teenagers age 15-19, 6% of the men and 1.2% of the women admit to having had at least one STD in the 12 months prior to DHS. Moreover, within this age group, the use of condoms against AIDS/STDs is reported to be as low as 4.4% among women and 29.7% among men. The lack of information is significant since 53.5 % of female teenagers and 35% of male teenagers have never heard of STDs.
- Genital excision is performed on 92.5% of adolescent girls and in 70% of the cases, this is done by a traditional female « exciser ».
- In 1997, a health center reported 4 cases of AIDS among the under 15 age group and 70 cases among the over 15 years old. According to a 1992 MSSPA/PLNS study, the countrywide average frequency of HIV/AIDS is 2%, with a higher frequency among women and in the Sikasso, Koulikoro and Bamako provinces. The media, parents and friends are the best channels of AIDS information for teenagers 15-19 years old.
- Women have their first sexual encounters at an earlier age than men since 25% of women have had a sexual encounter by age 15, against 2% of men. Precocious fertility<sup>5</sup> is higher among the 15-19 years old in rural areas (49.4%) than in urban areas (29.9%) and is associated with a low level of education. LeGrand et al.<sup>6</sup> have shown that, compared to young women who have received some education, young mothers with no education receive less pre-natal care, have children with a lower birth weight and vaccinate them less.
- According to DHS II, malnutrition affects 18.7% of adolescent girls (IMC lower than 18.5) particularly in rural areas and in the Koulikoro, Kayes and Sikasso provinces. Moreover, the high proportion of infants with low birth weight (16%) is a direct indicator of the mother's poor nutritional state. According to the 1988-89 budget-spending study (DNSI), 17.7% of 5-10 year old children were found to be under-weight ( $W/a < 2 SD$ ), and 9.8% were found to be

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<sup>3</sup> DeClercq D et al., 1996 Impact of helminth infections on academic performance and absenteeism in school children in Bamako, 1997

<sup>4</sup> Analyse de la situation des enfants et des femmes au Mali 1997, UNICEF

<sup>5</sup> DHS II, CPS/DNSI/MSSPA et Macro Inc 95-96

<sup>6</sup> LeGrand TK, Mbacké C, Stud. Family Plan. 24: 137-149, 1993

severely malnourished. ( $W/H < 2 SD$ ). Only around 1% of 5-14 year old children are being treated for severe malnutrition in a health center, which is only a very partial indication of the scope of the nutritional problem.

- Although since 1987 more children under age 3 survive in Mali, their nutritional condition has significantly worsened. According to DHS II, 30% of children under age 3 suffer from chronic malnutrition, 23% from severe malnutrition and 40% from low body weight (normally 2.3% of any age group in a healthy population). Severe malnutrition is more frequent in Bamako than elsewhere in Mali, whereas chronic malnutrition is more common in rural areas, and in particular the Kayes, Koulikoro, Sikasso et Ségou areas. In all these instances of malnutrition, the mother's lack of education is linked to a higher level of incidence.
- The total frequency rate of goiter in Mali exceeds 28.5% and 80% of the population is at risk for iodine deficiency.<sup>7</sup> Although no data is available, either at the country level or for children under 15, the provinces of Ségou, Mopti and Kayes appear to be among the most affected. Only 20% of the salt in Mali is properly iodized, and as little as 1.2% of households use clearly labeled iodized salt against 91% who use Senegalese salt purchased in bulk.
- According to specific studies, vitamin A deficiency affects 4-12% of all children and 70% of the total population is at risk<sup>8</sup>. According to DHS II, as few as 9.5% of the children have received vitamin A during the vaccination campaigns. The Northern region is most at risk. A study conducted in Timbuktu and Ségou has found a 6.45% rate of xerophthalmia (XN stage) among children 0-5 years old, and 9.48% among children from 6 -10 years old. This is well above the WHO standards. In the south and in the Bamako province<sup>9</sup>, 12-15% of children under 6 have a level of vitamin A inferior to 0.35  $\mu\text{mol/L}$  ( $N = 0.70 \mu\text{mol/L}$ ) with little noticeable seasonal variation.
- The frequency in Mali of iron/folate deficiency is unknown among school age and younger children. In West African countries, according to De Mayer et al., 55% of children age 6-12 and 43-44% of adolescents are moderately anemic (hemoglobin levels inferior to 120g/L).

Clean water is only accessible to 48% of the population, and 53% of the villages do not have a modern water supply. In urban areas, 19% of the population has access to adequate sanitary facilities against only 4% in rural areas. In Bamako, in 27% of schools, no sanitary facilities are available. 75% of those that do exist are out of order (UNICEF 97).

The MEB (Ministre d'Education du Base) does not maintain national statistics on the reasons for absenteeism or dropouts, the number of pregnancies, deaths, accidents and epidemics in the school age population. The data relative to psychosocial behavior, sensorial or psychomotor handicaps, or on school hunger are not available for pre-school or school age children.

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<sup>7</sup> Conference on the Sustainable Elimination of Health Problems Resulting From Iodine Deficiency in Africa by 2000  
1996 OMS/UNICEF/MNI/ICCID

<sup>8</sup> De Benoist B Rapport de mission WHO Mali, 1997

<sup>9</sup> Global Frequency of Vitamin A Deficiency 1995 OMS/UNICEF

In conclusion, children age 3-14 suffer from four main health problems: a) infectious and parasitic diseases, b) protein malnutrition and micronutrient deficiency, c) STDs and AIDS and, to a lesser extent, d) traumas.

Several risk factors affect children age 3-14: a) social: the mother has little or no education, and/or they live in rural areas, particularly in the Sahel Strip or in the North; b) behavioral or environmental due to the physical and sometimes social difficulties they confront at school.

## ***2.2 Impact of Poor Health and Nutrition on the Learning Capacity of Pre-school Age and School Age Children.***

**Learning ability:** Early childhood chronic malnutrition has been linked in 8-year-old children to an IQ 11 points lower than those of their well-fed counterparts.<sup>10</sup> Even moderate iodine deficiency can impair learning ability and can slow children's growth<sup>11</sup>. Iron and vitamin A deficiencies lead to anemia and lower resistance to infections, lower learning ability and a reduced capacity to work. The after effects of meningitis may also impair a student's cognitive ability.

**Sensor or motor ability:** Lack of vitamin A can deteriorate a child's eyesight. Lack of iron lowers physical strength and generates fatigue.

**Attention span, concentration ability and memory:** The attention span and ability to concentrate are lower when a child begins the school day on an empty stomach.<sup>12</sup> According to Levinger,<sup>13</sup> slight or moderate malnutrition experienced during early childhood can impact cognitive functions and can lead to apathy, attention deficit, as well as sensory and short term memory deficits and lowered stimuli responsiveness. Pollitt<sup>14</sup>, however, points out that if immediate hunger lowers the attention span and the concentration ability of students, it does not affect their learning ability. Children with parasites have a lower intestinal absorption capacity, which contributes to their poor nutritional health and in turn affects their attention and willingness to learn<sup>15</sup>. Apathy and sleepiness can result from moderate iodine deficiency (hypothyroid)<sup>16</sup>, while attention and memory in school children can be impaired as a result of iron deficiency.

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<sup>10</sup> Regard sur la nutrition. Situation des enfants dans le Monde 1998, Unicef

<sup>11</sup> Pollitt EK et al., 1990 Unesco Paris

<sup>12</sup> Jacoby E et al., Food and Nutr Bull 1996, 17:1, 54-64.

<sup>13</sup> Levinger B, Nutrition, Health and Learning Action group for Int. School Nutrition and Health

<sup>14</sup> Pollitt E, 1990 Malnutrition and infection in the classroom Paris Unesco

<sup>15</sup> DeClercq D et al Impact of helminth infections on academic performance and absenteeism in school children in Bamako, 1997

<sup>16</sup> A practical guide to the correction of iodine deficiency 1990, ICCDD, Unicef, WHO

### **3. Impact of Health, Hygiene and Nutrition Initiatives on the Learning Performance of School Children Age 3-14**

#### **Improve enrollment rates**

Initiatives to improve health, nutrition, and life skills and make the school child friendly encourage families to enroll their children, particularly their girls. In Burkina Faso and in the Dominican Republic, school meals have had a positive impact on enrollment rates. Initiatives that make the environment girl friendly and improve their safety (bright classrooms, provision of clean water and latrines) also encourage the parents to send their children to school.

#### **Improve Performance**

Lower the dropout rates and increase attendance: School attendance and learning results are directly linked<sup>17</sup>. A study conducted in Ghana by Glewne et al. has demonstrated that malnourished children begin school later and leave earlier than their well-fed counterparts. In Burkina Faso, the school meals program has improved attendance, lowered the repeat rate and improved girls' exam results<sup>18</sup>. An early morning snack given to Jamaican students led to better attendance and improved their results in math and reading tests.<sup>19</sup> Similarly in Peru<sup>20</sup>, attendance among children who had received an enriched breakfast was higher and they performed better in vocabulary tests. In the Dominican Republic, King et al. have shown that, when meals were no longer available, 25% of the children, including girls dropped out of school. The enrollment rate in Honduras rose by 12% after food vouchers were distributed.

In cases of weak to moderate parasitic infection, malaria incidences in 800 children under age 5 were reduced by a third after they received vitamin A. Acute infections were not improved.<sup>21</sup> Although no study shows an obvious link between vitamin A intake and improved performance, it appears likely that lessening diarrheas, respiratory infections and measles incidences by the administration of vitamin A would improve attendance and therefore learning performance. Nokes et al<sup>22</sup> have also shown that the attendance rate of children infected with helminth was half that of children not infected.

Lower the repeat rate: Israel et al. have noted that chronically malnourished children were twice as likely to repeat a class than well-fed children of the same socioeconomic background. Florencio C, Batista J et al. have shown that Philippine or Brazilian children who have vision disorders do not perform as well in school and dropout earlier than those who are not affected. Precocious pregnancies among adolescent girls, often associated with complications, also lead to dropout or repeat.

Improve student participation and attention span: In Bolivia, iodine supplements have significantly increased student IQs particularly among girls<sup>23</sup>. Similarly in Malawi, after 3 years of giving iodine supplements, the IQ of iodine deficient children was found to have risen by an

<sup>17</sup> Ceci R, in Class Action World Bank, 1996

<sup>18</sup> Moore 1994

<sup>19</sup> cited in Israel RC ECD 1990

<sup>20</sup> Jacoby E et al., Food Nutr Bull 17: 1, 54-64

<sup>21</sup> Shankar A in La situation des enfants dans le monde, 1998, Unicef

<sup>22</sup> Nokes C Bundy D Parasit Today 1994, 10, 14-18

<sup>23</sup> Bautista A et al., Am J Clin Nutr 35:127-34, 1982

average of 21 points.<sup>24</sup> In China<sup>25</sup>, a program of salt enrichment improved hearing in iodine deficient children. In Thailand and Indonesia, iron deficient children who received supplements improved their test results as well as their attention and participation in class.<sup>26</sup> Nokes et al. noted that helminth infected children who received treatment recovered their memorization ability within nine weeks.

This rapid overview of the literature demonstrates that the effects of health and nutrition initiatives on school performance is poorly understood, particularly in Africa where it is difficult to control all the factors and undertake longitudinal studies.

#### **4. Possible Strategies**

Four priority health issues emerge from the epidemiological study of children age 3-14 and from the strategic choices made by PRODEC and PRODESS (Ten-Year Project for Health.) The scope of these priorities varies according to the target groups as well as their behavioral problems and the sanitary conditions of the school environment (see detail in Annex 2).

##### ***4.1 Health problems***

- Because of the frequency of infectious diseases among younger children, the lack of access to school health centers<sup>27</sup> and the low rate of immunization, prevention appears to be the strategy of choice. Extension of the PEV benefits to children in pre-school has been proposed since the infrastructure and the trained staff already exist within the MSSPA. Children entering primary education would be eligible for immunization upon enrollment.
- The yearly treatment of intestinal helminth for students in pre-school and all three cycles of basic education would improve their nutritional status and reduce parasitic transmission at school. This action is also supported by the Program for Social and Sanitary Development<sup>28</sup>. The treatment of 7-11 year old students infected with urinary schistosomiasis and living in already wellcharted areas of Mali would be beneficial since it would both prevent medical complications and transmission within the community. Availability of health agents and regular provision of medication to the schools are problematic. Two obvious difficulties arise as well if teachers administer the medication: liability toward the families and the extent to which the health agents will collaborate with them. In addition, teachers would require training as to the handling and administration of these products. A cost recovery mechanism involving parental participation must be studied in order for this activity to become sustainable in the third phase of the project.

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<sup>24</sup> Serestha R Ph D thesis University of Malawi

<sup>25</sup> Yan yun W et al., Lancet, 1985, 8454

<sup>26</sup> Yan yun W et al., Lancet, 1985, 8454

<sup>27</sup> 177 CSCOM or functional CSA-R or 22. 5% of the Health zones in the Documentation of the 10 Year Plan for the Sanitation and Social Development 1996, MSSPA

<sup>28</sup> Nutrition under-phase 1998

- Teacher supervision of the school cafeteria cooks and food vendors in and around the school would allow regular monitoring of sanitary practices in the production and storage of food. Furthermore, it would reduce the risk of intoxication for students and insure early morning meal distribution. The training of food vendors is already scheduled within the PRODESS. The second phase of the project should study distribution of enriched cereal snacks to early childhood development centers.
- Promoting iodized salt: distribution of iodized oil has been abandoned by the MSSPA because it was too expensive and its benefits were time limited. Iodization of well water was also abandoned, because of its cost and dependence on a reliable water supply. Import of iodized salt was chosen since it is possible to encourage use and consumption of iodized salt in schools by promoting its benefits to school cooks, food vendors and children and therefore to households.
- Pre-school children should receive a first dose of vitamin A when their vaccines are updated and a second one six months later. This initiative would improve the immunity status of this particularly vulnerable age group. Promoting consumption of carotene rich foods for other age groups appears to be the most viable strategy since the implementation of vitamin A enrichment of food is limited by the low operational capacity of the agro-processing industries in Mali.
- Three strategies are possible to prevent anemia: a) preventive supplementing of iron, difficult to implement for logistical and compliance reasons; b) iron enrichment of a basic food, less expensive, more efficient and sustainable, and which can benefit the entire population; c) encouraging consumption of iron rich foods. Because of great variations in eating habits as well as the high cost of producing an enriched food at the national level (see local salt iodization), option (b) is not feasible in the short term but should be studied. The project will support option (c), already adopted in the PRODESS of encouraging consumption of iron rich foods.
- HIV/AIDS, STDs and unwanted pregnancies: responsible sexual behavior education with an emphasis on preventive methods is a priority because of the threat caused by the HIV/AIDS epidemic. Additionally, it would strengthen the initiatives of the National Program to Fight HIV/AIDS. A social marketing campaign for the use of condoms could be studied for secondary schools students.
- The occurrence of wounds, traumas and burns is frequent among 5-14 year olds. In answer to a frequently cited parental concern, promoting safe behavior at home, on the way to school and in school will be integrated in the Health Education Program.

#### ***4.2 Behavioral problems and environmental issues***

- In order to modify behavior, the life skills of the students must be improved. Health education, as a vital component of basic education should reinforce the students' positive

abilities, attitudes and skills as well as increase their knowledge and critical understanding of beliefs and harmful practices.

- In schools where a clean water supply and latrines are already available or soon will be, the best strategy to improve the cleanliness and the environment is to offer direct support to the school management committees. This also encourages the students' healthy behavior towards hygiene and improves their living conditions.

## 5. Description of the School Health, Hygiene and Nutrition sub-component

PRODEC's first component (Improving the Quality of Education and Learning) includes health, hygiene and nutrition initiatives at the basic education level (early childhood development (ECD), primary education (PE) in public and community schools) and at the secondary education (SE) level.

The objective of the School Health Program is to improve the quality of education by i) reinforcing skills-based life education, behavioral modifications among children enrolled in pre-school and primary education, ii) improving the school environment and living conditions, iii) performing an array of essential services.

Targeted regions: the Program will be implemented in priority areas as defined by the 10 Year Plan for the Development of Education, namely the Northern regions (Timbuktu, Kidal, Gao and Mopti) and in the Sahel Strip (Kayes, Ségou, Koulikoro).

The Program targets all pre-school education facilities. The implementation criteria for primary education will be based on a net enrollment rate inferior to 40% and a gross admission rate for girls in the elementary cycle inferior to 30% for each DRE.

For each of the three phases below, the Program will support:

- Phase 1: 20 % of the public and community schools of the 4 Northern DREs, 15% of the schools of the 3 Sahel Strip DREs and 10% of the schools from the other 2 regions; 25% of the public and community centers for early childhood development.
- Phase 2: 40 % of the public and community schools of the 4 northern DREs, 30% of the schools of the 3 Sahel Strip DREs and 20% of the schools from the other 2 regions; 75% of the public and community centers for early childhood development.
- Phase 3: 60 % of the public and community schools of the 4 northern DREs, 50% of the schools of the 3 Sahel Strip DREs and 30% of the schools from the other 2 regions; 100% of the public and community centers for early childhood development.

The criteria for regional selection will have to be specified in the second phase of Program implementation based upon available regional data and regional initiatives.

### **5.1 Sub-component 1: Reinforce Factors Encouraging Healthy and Safe Behavior.**

**Objective:** The Program will enable the ME to: i) improve pre-school teacher training in health, hygiene, and nutrition-skills education, develop personal and social skills in the students, manage, supervise and evaluate essential services; ii) upgrade the basic education curriculum in early awareness activities by testing new methods of learning based on the acquisition of knowledge, skills-based health and nutrition education and teaching of positive attitudes; and iii) develop, test and distribute new learning materials in the local language.

**Anticipated results:** The Program will form 12 main instructors, will train 60 teachers to train others (inspectors and education counselors), 200 pre-school teachers, 1970 basic education teachers (all 3 cycles) and 1970 school principals; additionally, the Program will upgrade 30 pre-school teachers, 650 basic education teachers and 650 school principals. This Program will be carried-out in 200 early childhood development centers, will reach 12,000 children age 3-6 and 500,000 children age 7-14.

#### **Description of activities**

##### **a) Upgrade the school curricula for health, nutrition and skills-based life education:**

This activity is designed to create or improve programs in pre-school and in all three cycles of basic education. The curricula will be tested during the first year of program implementation. Problem resolution skills, ability to make informed decisions, communication, stress management and conflict resolution will be emphasized according to age and gender. Priority health education issues will be: reproductive life and responsible sexual behavior, prevention of STDs and HIV/AIDS, individual and environmental hygiene, both at home and at school, healthy and balanced nutrition and the prevention of common diseases and accidents.

**b) Improve teacher training:** This activity is designed to provide new training to both future trainers and teachers and to upgrade in-service teachers. The Program will organize and finance: i) sensitization workshops for the main instructors, ii) workshops to elaborate the training modules for the future trainers, training workshops for inspectors and education counselors at the IFM level and for the in-service CAP teachers and principals. The modules will be tested during the first year of program implementation. Finally, the Program will finance iii) the training every other year of supervisors by the team of main instructors at the IFM and CAP levels, and every three years the upgrading of CAP level teachers by the inspectors and education counselors.

**c) Develop, test and distribute new educational material:** This activity is designed to supply both the trainers of future trainers and the teachers with the necessary educational and instructional material to implement the new revised HHN curricula. The Program will organize and finance planning workshops to create instructor and student guides and instructional material (posters, picture boxes, cartoons, coloring books etc...). This educational material will be tested during the second year. Already existing material that has already been used successfully in pilot programs will serve as a base. Publishing,

printing and distribution procedures for guides and instructional support material will be the same as the one adopted by PRODEC for school manuals.

**Priorities:**

- Identify a technical team to revise curricula, train future trainers, and create training modules and instructional material.
- Test and validate curricula, modules and educational material
- Develop and validate detailed action plans, monitoring and evaluation methods and budget.

**Activity management:**

A technical unit composed of members from the IPN directorate, the DNEF, the CPS, 3 executive MSSPA representatives for school medicine, water and sanitation, and nutrition, as well as UNICEF, USAID and WHO representatives will revise and create curricula, training modules and instructional material. The DNEF will identify a focus to ensure planning, training organization, monitoring and evaluation and will work with the DREs for the decentralization of activities during the first phase of the Program. The DREs will be consequently in charge of the execution phase since they will be responsible for training, supervising, distributing the educational material and the monitoring and evaluation.

**5.2 Sub-component 2: Ensure a safe and sanitary school environment**

**Objective:** As part of its Access to Education initiative, in the next ten years PRODEC plans the construction of latrines, clean water supplies and school cafeterias. In addition approximately 2,000 additional classrooms should be built yearly and 3,000 existing classrooms rehabilitated. School cafeterias, managed by the community and supported by NGOs and PTFs (WFP, Coopération française) already exist in the Northern provinces. The HHN Program will support this school initiative by: i) improving provision and management of clean water, latrines and school fences, ii) monitoring the sanitary handling of foods served in and around the schools and in cafeterias, and iii) ensuring student safety, particularly that of girls while at school and on their way to school.

**Anticipated results:** 200 ECD centers and 1,200 schools will be provided with a clean water supply, latrines and maintained fences. 200 school cafeteria cooks and 200 school vendors will be trained in sanitary food handling (personal hygiene, preparing and preserving meals). MSSPA agents will train 1,200 school principals and 1,200 management committees in water/ hygiene/ sanitary food handling activities. 600 schools and 200 ECD centers will receive “Water Kits”. 600 schools and 200 ECD centers will have sensitized the management committees and the communities on the need to accompany children to school as well as to supervise them in urban areas with heavy traffic. Finally, 1,200 schools will keep a log of accidents, deaths, epidemics and absences resulting from disease or pregnancy.

**Description of activities**

- a) Improve school management of clean water supply, latrines, courtyards and fences:**  
The school or ECD center principal will be trained to monitor and supervise these activities

and to guide the management committee. The task of the management committee will be to plan, manage and evaluate school water and sanitation activities and to seek partnership support (NGOs, MSSPA technicians, community sponsors etc.). To support the committees, the Program will also finance an IEC kit (posters, banners, information cards, signs etc.) about water and sanitation. Water Kits (composed of an improved barrel for water preservation, kettle, soap, basic cleaning kit, etc.) will be supplied in the second phase of the Program.

**b) Monitor sanitary food handling:** The school or ECD center principal will be trained to monitor and supervise these activities and to lead the management committee. The management committee will be responsible for checking, at least once a week, that cafeteria meals are properly prepared using clean utensils and that the cooks maintain a good personal hygiene. During the IEC campaigns, the management committee will educate the parents on the nutritional needs of children and the necessity to give them a meal before school. The management committee will, at least once a week, verify sanitary preparation of the food, quality of ingredients and storage of meals and drinks sold to the students by food vendors within school grounds. The Health and Sanitation Service will perform an official site visit at least twice a year. Local and community authorities will assist the management committees in their work. The Program will finance an operational study in ECD centers to serve an enriched cereal snack (iron, vitamins) or an energetic vitamin boosted drink to students at the beginning of the day.

**c) Student safety:** Safety behavior and respect of others is included in the curricula. The management committee will collaborate with local authorities to ensure the safety of the students on the way to school (accompaniment etc.)

**d) Student health log:** The school principal will maintain a log of accidents, absences due of illness or pregnancy, deaths and epidemics. He will communicate this log to the CSCOM health agent every trimester. The log format will be devised in collaboration with MSSPA. The school and ECD center principals will receive training on their proper use.

**e) Train and sensitize all personnel involved:** The in-service principals from schools and ECD centers will be trained to supervise and monitor water/ sanitation/ nutrition activities at the CAP level. They will also receive training with regards to the new curriculum. Furthermore, they will collaborate with MSSPA agents and, whenever possible local NGOs to sensitize the management committees, cooks and food vendors to these issues.

#### **Priority actions:**

- Identify a team of trainers' trainers who will elaborate a mini-training module for school and ECD principals and management committees, and who will identify both IEC tools and a health log format.
- Test and validate the module and the tools.
- Invite bidding for the Water Kits.
- Develop and validate detailed action plans, monitoring and evaluation methods and budget.

#### **Management of activities:**

In the first phase of the Program, the CAPs will be responsible for the training of school and ECD principals and for the sensitization of the management committees. The DREs will be consequently in charge of the execution phase since they will be responsible for school supervision, the purchase and distribution of the Water Kits and the monitoring and evaluation of the activities. Local action plans to identify partners and collaborators will be included in this phase.

### **5.3 Sub-component 3: Provide Essential Services**

**Objective:** As part of its initiative to Improve the Quality of Education, PRODEC, in partnership with the MSSPA will provide or support services to students in early childhood development (ECD) and basic education. The HHN Program will: i) treat students against parasitic infections on a yearly basis in accordance with a protocol and methods approved by the MSSPA, ii) educate parents on the need to update children's vaccinations when they begin basic education and support immunization of children in pre-school iii) distribute vitamin A twice a year to children in pre-school, iv) promote iodized salt and iron and carotene rich foods in school cafeterias and in the households via the students, v) educate secondary school students on the use of condoms.

**Anticipated results:** 12,000 children from ECD centers and 50,000 first grade students will be properly immunized. 12,000 children from ECD centers and 50,000 basic education students will have been treated against parasites. Two doses of vitamin A will have been administered to 12,000 ECD children. 1970 schools will have organized an "Iodized Salt and Iron and Vitamin A Rich Foods" Awareness Day. 100 secondary schools will promote the use of condoms.

#### **Description of activities**

- a) **Yearly treatment against parasitic infections:** A yearly treatment against parasites will be organized by the school and administered to the students by teachers trained to this task. The health agent from the sanitary department will be present if possible. The project will also finance the yearly provision of pharmaceutical products that will be distributed in the same manner as the school manuals. The management committee will supervise the storage of these products and will be responsible for monitoring and evaluating this activity.
- b) **Immunization of children in pre-school:** The ME will support MSSPA immunization campaigns for pre-school children. The principal of the ECD center and CSCOM will organize a Vaccination Day jointly. The children will simultaneously receive a dose of vitamin A. An entry will be made into the health log in order to avoid administration of a double dose. A second dose will be given 6 months later by the teachers.
- c) **Promotion of iodized salt and iron and carotene (vitamin A) rich foods:** The Awareness Day and treatment against parasitic infections will be held simultaneously. The students' mothers will be educated as to the nutritional needs of their children (frequency and composition of meals, energy rich foods, protein, iron, carotene and iodized salt consumption). The necessary IEC tools as well as test kits to determine the iodization level of the salt will be supplied by the project. This Day will provide an opportunity to

involve parents and influential people within the community. The health club and the management committee will play a key role.

**d) Social marketing:** The Program will support a social marketing campaign for the use of condoms carried out by the MSSPA and the PNLS targeting adolescents 15 years old and above in secondary schools.

**e) Technical research:** A base line study to measure the proportion of parasite-infected children will be conducted in flag schools. This study will be repeated at the end of each step to evaluate progress. A targeted nutritional study on iodized salt and iron and carotene rich foods intake will be performed in households and will measure changes in eating habits at the end of each step of the Program.

**Priority actions:**

- Identify a multidisciplinary work group to implement the health/education partnership, to approve protocols and distribution of pharmaceutical products, IEC tools and test kits.
- Identify study groups to perform technical research in partnership with IRNSP.
- Develop and validate detailed action plans, monitoring and evaluation methods and budget.

**Management of activities:**

The training of the school principals and management committees will be carried out by the CAPs in collaboration with the health centers of the “Circles” during the first phase of the Program. The DREs will be consequently in charge of the execution phase since they will be responsible for school supervision, the purchase and distribution of products and the monitoring and evaluation of the activities in partnership with the separate structures of the MSSPA. Local action plans to identify partners and collaborators will be undertaken.

**5.4 Sub-component 4: School/Family/Community Partnership**

**Objective:** The purpose of these activities is to reinforce behavioral modification in schools by: i) involving students and families, and ii) ensuring an efficient collaboration between teachers and health agents.

**Anticipated results:** In 600 schools the Program will: i) create and sustain student managed health clubs and child-to-child activities ii) prepare 600 contracts between the management committees and the schools.

**Description of activities**

**a) Health clubs and the child-to-child approach:** The Program will support activities designed not only to benefit students but requiring their active involvement. The health clubs will enable students to participate in social and sanitary activities both in and outside of school and to develop their personal and social skills. Lectures, discussions, site visits and volunteer activities will be organized with the help of community partners (clerics, health agents, youth associations, merchants etc.) The child-to-child approach will enable students of

the second and third cycles of basic education to share their knowledge and skills with younger or out-of-school peers. The Program will also support the creation of a directory of all local experimented NGOs that might collaborate with the management committees to implement these activities.

**b) The school contract:** The Program will support a contract by which the management committee will pledge to work for the benefit of the school. Moreover, the Program will finance, monitor and evaluate the results (for instance the provision of a sports field or a safety perimeter around the water well etc.). In a second phase, the Program will further finance regional workshops to elaborate model school contracts and help school principals, management committees and local institutional partners to implement them.

**Priority actions:**

- Identify partner NGOs. Sensitize key education and health groups to the health club activities, to the child-to-child approach and to the school contracts.
- Develop and validate detailed action plans, monitoring and evaluation methods and budget.

**Management of activities:**

The DREs will be in charge of the execution phase since they will be responsible for school supervision and the monitoring and evaluation of the activities.

## **6. Strengthening of the ME's Institutional Capacity**

The intended objective is to improve the ME's institutional capacity to perform the previously discussed initiatives.

### ***6.1 Increase the ME's capacity to evaluate health, hygiene and nutritional needs***

For each target of the project initiatives targets, the following studies will be conducted:

- Base-line and phase completion studies of 1) household intake of iodized salt as well as iron and carotene rich foods, 2) intestinal parasitosis and urinary schistosomiasis in the flag schools identified by the MSSPA/INSP according to ecological and endemicity zones. Reference terms will be defined by the ME/MSSPA.
- Base line and phase completion studies of accidents as well as of frequency and composition of meals taken by children conducted by the ME/CPS. Reference terms to be defined by the ME/MSSPA.
- Qualitative study of behavior modification and of the level of satisfaction of the beneficiaries (parents/students) conducted by an NGO. Reference terms to be defined by the ME
- System monitoring and evaluation by the ME of absences due to health reasons.

### ***6.2 Increase the technical capacity to implement these strategies.***

### **Teacher training**

- In partnership with health and education innovation specialists, teachers will be trained to work with the new curricula, the new instructional material and the health education programs.
- The MSSPA will support teacher training to the methods of distribution and storage of vitamin A and administration and storage of anti-parasite treatment.
- The CNIECS will support training to lead Awareness Days to promote iodized salt and iron and carotene rich foods).
- A protocol to monitor sanitary food handling (school cafeterias and vendors) must be implemented and teachers sensitized to this issue.
- Experimented NGOs, with the support of UNICEF should devise the training methods to develop the necessary skills to lead the health clubs and the child-to-child approach.
- Activities supporting the management committees, the elaboration of the school contract and the monitoring and evaluation of activities should be financed by the ME's own resources (PRODEC, CPS, DNEF) and the key NGO groups.

### **Management and initiative planning**

- A key division within the DNEF will be identified to plan and manage HHN initiatives. Staff will be trained to fulfill the following requirements: activity planning, estimated yearly budget, quarterly report of operations cost, spending report and supply management report. Within the framework of DRE decentralization, an agent will be trained in each region to manage supplies, activity planning, and estimated budget and will report to the DNEF.
- The DAF will be responsible for supply management, fund raising, will evaluate proposals, will hire consultants and form group studies according to the World Bank Procedure Guidelines. Following receipt of requests from the DREs, a detailed Provision Planning will be supplied quarterly to the DAF by the DNEF division.

### **The monitoring and evaluation of the initiatives and the information system**

**The monitoring:** Data collecting will make possible planning, program monitoring and execution, and the sharing of the information with partners. A main team as well as a regional agent will be identified both at the DNEF level and each DRE and trained to computerize the data and to create spreadsheets in collaboration with the ME's CPS and the CP's CT. The school principals and the heads of the management committees will also be trained to collect data.

Monitoring Fact Forms including activity specific indicators will be filled out by the management committees once a year. The school principals will then send the Forms to the Academy. The DRE will compile them and perform a preliminary analysis. The preliminary data obtained will then be electronically transmitted to the DNEF who will make an annual report.

**Evaluation:** The results collected in schools will be used for the evaluations. An education counselor will supervise school activities at least once a year. Regular supervisions will also be carried out by the DNEF division responsible for the monitoring and evaluation.

These evaluations will also be beneficial for teacher training and reinforce the management committees. The results will be evaluated upon completion of the Program.

## 7. Initiative Implementation

It was not possible during this mission to evaluate the detail of the methods of initiative implementation since all proposed initiatives will require the ME and MSSPA's prior approval.

However, the proposed organizational plan for potentially problematic activities is as follows:

| Activities   | Option 1                            |  | Option 2   |                                   |
|--|-------------------------------------|--|--|-----------------------------------|
|  | Advantage                           | Disadvantage   | Advantage  | Disadvantage                      |
| Vaccination  | CSCOM Agent                         |  | Non applicable   |                                   |
|  | Trained staff<br>Technical capacity | Means of<br>transportation                                 |  |                                   |
| Parasite Treatment<br>- Administration<br>- Distribution           | CSCOM Agent                         |  | Teacher  |                                   |
|  | Technical capacity                  | Unavailability<br>Means of<br>transportation               | Availability   | Training                          |
|  | MSSPA-CSCOM Circuit                 |  | ME-DRE Circuit   |                                   |
|  | Additional cost                     | Delivery delays  | Transport already<br>identified<br>Involvement of the<br>management<br>committee | Product alteration                |
| Support to Cooks and<br>Vendors                                    | MSSPA/DRHE                          |  | Teacher  |                                   |
|  |                                     | Additional cost<br>Distance<br>Circle/school<br>Regularity | Available and does<br>not need to travel   | Training                          |
| Distribution of vitamin A,<br>2 <sup>nd</sup> dose                 | CSCOM Agent                         |  | Available and on location  |                                   |
|  | Reading of the<br>Health log        | Not available  | Available and does<br>not need to travel   | Training, update of<br>health log |
| Promotion of iodized salt,<br>and iron and vitamin A rich<br>foods | NGO                                 |  | Teacher  |                                   |
|  | IEC capacity                        | Additional cost  | Knows the parents  | Training                          |

In conclusion, all activities should be implemented by the ME by means of its DREs except for those of immunization and promotion since a local and competent NGO can step in to lead mobilization and communication activities.

## 8. Human and Financial Resources

Resources, schedule and indicators mentioned in the table in Annex 3 will need to be validated and implemented in the form of a yearly activity plan. The specific budgets must also be approved and detailed for each activity.

## **9. Next steps**

- Create an ME/MSSPA work group and organize a national workshop to validate the Program.
- Identify a division of the DNEF as well as a member of the CP's CT and of the CPS to insure planning and implementation of the Program.
- Identify the main teachers and invite them to participate to training workshops in Guinea and to televised classes.
- Identify a team to create new curricula, training methods, instructional and IEC tools.
- Call for bidding offers for pharmaceutical products and other inputs.
- Prepare an action plan to begin immunizations in ECD centers by the beginning of the next school year.
- Prepare and approve both a yearly and multi-year activity plan as well as a detailed budget.

## Appendix 1 Causes des décès

Les principales causes de décès recensées en 1996 dans les structures sanitaires<sup>29</sup> chez les enfants de 1 à 14 ans sont les suivantes :

|                                 | 1 à 4 ans<br>Proportion (%) | 5 à 14 ans<br>Proportion (%) |
|---------------------------------|-----------------------------|------------------------------|
| paludisme présumé               | 23,9                        | 12,7                         |
| infections respiratoires aiguës | 16                          | 8,7                          |
| rougeole                        | 13,1                        | 6,2                          |
| maladies diarrhéiques           | 12,6                        | 11,2                         |
| méningite                       | 5,7                         | 36,3                         |
| malnutrition                    | 5,5                         | 2,5                          |
| tétanos                         | 4,8                         |                              |
| autres causes                   | 18,4                        | 22,5                         |

Les données de morbidité suivantes sont une estimation partielle extraite des données statistiques collectées dans les formations sanitaires par le MSSPA pour l'année 1997 et ne reflètent pas l'ensemble de la situation au Mali.

### Causes de morbidité

|   | 5 à 14 ans<br>Proportion<br>(%) |
|---|---------------------------------|
| paludisme présumé                               | 31,5                            |
| infections respiratoires aiguës                 | 21                              |
| traumatismes et brûlures                        | 12,25                           |
| maladies diarrhéiques                           | 5,53                            |
| bouche et dent                                  | 3,3                             |
| schistosomiase urinaire                         | 2,9                             |
| maladies de la peau                             | 2,8                             |
| rougeole  | 2,15                            |
| MST   | 1,63                            |
| méningite                                       | 1,5                             |
| MPÉ   | 0,8                             |
| pathologie de la grossesse et de l'accouchement | 0,35                            |
| autres causes                                   | 14,29                           |

<sup>29</sup> annuaire statistique SIS/MSSPA, 1996

## Appendix 2 Cadre du projet

| Problèmes  | Objectif  | Population ciblée                    | Impact  | Coordination ou exécution | Date de MEO <sup>30</sup> | Partenaires             |
|--|---|--------------------------------------|---|---------------------------|---------------------------|-------------------------|
| 1- de santé  |   |                                      |   |                           |                           |                         |
| Maladies infectieuses et parasitaire                             | Actualiser le statut vaccinal (rougeole particulièrement) | 3-6 ans<br>1 <sup>ère</sup> année EF | ↓ maladies infectieuses<br>↓ absentéisme                    | MSSPA                     | 2004<br>2007              | UNICEF/OMS/<br>USAID    |
|  | Déparasiter une fois par an contre les helminthiases      |                                      |   | MSSPA et/ou ME            |                           |                         |
|  | Albendazole   | 3-6ans                               | ↓ ankylostomiasis et ascaridiose                            |                           | 2003                      |                         |
|  | Praziquantel  | 7-11 ans                             | ↓ schistosomiase urinaire<br>↓ absentéisme et redoublement  |                           | 2003                      |                         |
|  |   | 7-11 ans                             |   |                           | 2003                      |                         |
| Malnutrition protéino énergétique et carence en micro nutriments | Appui aux cantines scolaires                              | 7-14 ans                             | ↓ absentéisme   | ME                        | 2004                      | MSSPA/PAM/<br>CRS/COOPF |
|  | Appui aux vendeuses                                       | 7-14 ans                             | ↑ attention   | ME                        | 2004                      | MSSPA/FAO               |
|  | Promotion sel iodé  | DEP mères                            | ↓ goître<br>↓ redoublement                                  | ME                        | 2003                      | UNICEF                  |
|  | Capsule vitamine A avec vaccination                       | 3-6 ans                              | ↓ absentéisme   | MSSPA et/ou ME            | 2004                      | UNICEF                  |
|  | Promotion des aliments riches en fer                      | DPE mères<br>7-14 ans                | ↓ anémie<br>↓ absentéisme<br>↑ attention                    | MSSPA et/ou ME            | 2004                      | UNICEF                  |
| MST/SIDA   | Promotion vie sexuelle responsable                        | 12-14 ans                            | ↓ grossesses précoces<br>↓ MST<br>↓ abandon et redoublement | ME                        |                           | MSSPA                   |
|  | Promotion du condom                                       | 15-17 ans                            | ↓ MST/SIDA  | PLNS/MSSPA/<br>ME         | 2004                      | ONUSIDA                 |
| Traumatismes   | Promotion comportement sécuritaire                        | mères 3-6ans<br>7-14 ans             | ↓ plaies, brûlures<br>↓ absentéisme                         | ME                        | 2004                      | Municipalités           |
| 2- Comportemental  |   |                                      |   |                           |                           |                         |

<sup>30</sup> mise en oeuvre

|                           |  |                                     |  |        |      |                       |
|---------------------------|--|-------------------------------------|--|--------|------|-----------------------|
| Compétence de vie         | Programme de développement des habiletés (résolution de problème, prise de décision, communication, maîtrise du stress, règlement de conflits) | 3-6 ans<br>7-14 ans                 | Curricula adopté et guides distribués<br>20% des enseignants utilisent les curricula                 | ME     | 2003 |                       |
| Éducation à la santé      | Programme hygiène/maladies courantes/nutrition/sécurité et vie sexuelle responsable  | 7-14 ans                            | Curricula adopté et outils pédagogiques distribués<br>20% des enfants ont amélioré leur savoir faire | ME     | 2003 | MSSPA                 |
|                           | club santé   | 7-14 ans                            | 20% club santé fonctionnel<br>20% des écoles   | ME/ONG | 2004 | UNICEF                |
|                           | enfant par enfant  | 7-14 ans                            | 20% des écoles   | ME/ONG | 2004 | UNICEF                |
| <u>3- Environnemental</u> |  |                                     |  |        |      |                       |
| Eau propre                | Gestion et entretien par le comité de gestion<br>Contrat école   | École EF avec point d'eau, latrines | 30 % comité de gestion actif<br>20 % écoles propres<br>10 % contrat école signés                     | ME     | 2004 | UNICEF/<br>MSSPA/DNHE |
| Latrines                  |  |                                     |  |        |      |                       |
| Clôture                   |  |                                     |  |        |      |                       |

### Appendix 3

| Activités   | Actions  | Ressources   |   |  | Échéancier  | indicateurs   |
|---|--|--|---|--|---|---|
|   |  | Humaines   | Financières<br>Coût global<br>(millions de<br>FCFA)                         | matérielles                                      |   |   |
| <b>Volet 1</b>  |  |  |   |  |   |   |
| 1-Actualiser les curricula  | ateliers de conceptualisation production et mise en oeuvre   | 12 p<br><br>5 p<br><br>12p<br><br>7p<br><br>3p<br><br>3p | 1,50<br><br>25,5<br><br>1,50<br><br>1,50<br><br>70,0<br><br>5,5<br><br>25,0 | manuel scolaire actualisé<br><br>module et guide | 2000<br><br>2002<br><br>2000<br><br>2000<br><br>2001-10<br><br>2006-10<br><br>2007-10 | 50% des enseignants utilisent le curricula rénové, les guides et les supports didactiques |
| 2- Former les enseignants   | séminaires sensibilisation ateliers conception ateliers formation session supervision formative session recyclage atelier de conceptualisation, test, production, distribution | 12p  | 1,5<br><br>50,0   | supports didactiques                             | 2001<br><br>2002-10   | 30% des élèves ont amélioré leur savoir faire   |
| 3- conceptualisation, test et validation des guides et des supports didactiques |  |  |   |  |   |   |
| <b>Volet 2</b>  |  |  |   |  |   |   |
| 1-gestion de l'eau propre, des latrines, des cours et des clôtures à l'école:   | atelier conception ateliers formation et sensibilisation production et achat, distribution Kit eau et IEC  | 3p<br><br>3p   | 1,5<br><br>50,0<br><br>50,0   | guide<br><br>Kit IEC<br><br>Kit eau              | 2001<br><br>2002-10<br><br>2002-10  | 30% des écoles ont des latrines propres, un point d'eau aménagé, une clôture              |
| 2-surveillance de l'hygiène alimentaire   | atelier conception, production protocole ateliers formation recherche opérationnelle   | 3p<br><br>3p<br><br>3p<br><br>bureau d'étude, consultant | 1,5<br><br>0,5<br><br>-<br><br>80,0   | fiches   | 2001<br><br>2002-10<br><br>2005   | 20% des écoles offrent des repas adéquats aux élèves                                      |

|   |  |                                  |                           |                              |                 |  |
|---|--|----------------------------------|---------------------------|------------------------------|-----------------|--|
| 3-registre santé des élèves                   | conception,<br>production registres<br>ateliers formation                    | 3p<br>3p                         | 1,5<br>0,5<br>-           | registres                    |                 |  |
| <b>Volet3</b>                                 |  |                                  |                           |                              |                 |  |
| 1-déparasitage                                | ateliers formation<br>appel d'offre, achat,<br>distribution                  | 3p<br>1p                         | 50,0<br>100,0<br>5,5      | Albendazole<br>Praziquantel  | 2002-10         | 30% des élèves sont déparasités  |
| 2-vaccination et vitamine A                   | ateliers formation<br>appel d'offre, achat,<br>distribution                  | 3p<br>1p                         | -<br>50,0<br>-            | Capsules vit A               | 2002-10         | 80% de élèves sont vaccinés et ont reçu de la vitamine A                               |
| 3-journée sel, fer, vit A                     | ateliers formation,<br>élaboration, production des supports                  | 3p<br>3p                         | -<br>50,0                 | support IEC                  | 2002-10         | 20% des écoles ont organisé une journée de promotion                                   |
| 4-enquête parasites et habitudes alimentaires |  | bureau<br>d'étude,<br>consultant | 100,0                     |                              | 2001-05-09      |  |
| <b>Volet 4</b>                                |  |                                  |                           |                              |                 |  |
| 1-club santé et E/E                           | atelier formation et sensibilisation annuaire ONGs                           | 3p                               | 50,0<br>3,0               | Support IEC                  | 2002-10<br>2001 | 20% des écoles ont un club santé fonctionnel   |
| 2-contrat-école                               | atelier régional conception<br>atelier formation et sensibilisation          | 3p                               | 1,5<br>-                  | Contrat type                 | 2004<br>2004-10 | 10% des comités de gestion ont signé un contrat  |
| <b>Capacité institutionnelle</b>              |  |                                  |                           |                              |                 |  |
| 1-suivi/évaluation                            | ateliers formation<br>conception,<br>production fiches, support informatique | 3p                               | 10,0<br>1,5<br>5,5<br>5,5 | fiche, module                | 2001            | 50% des écoles font un suivi/évaluation adéquat et 50% des DREs traitent l'information |
| 2-gestion                                     | atelier formation  | 3p                               | 10,0                      | support                      | 2001            |  |
| 3-groupe de travail inter sectoriel           | atelier de validation du programme et des                                    | 5p                               | 1,50                      | lettre d'entente<br>ME/MSSAP | 2001            |  |

|                          |   |  |      |                             |  |  |
|--------------------------|---|--|------|-----------------------------|--|--|
| 4-transport des intrants | protocoles de collaboration<br>transporteur privé |  | 25,0 | intrants dans les<br>écoles |  |  |
|--------------------------|---|--|------|-----------------------------|--|--|

**MOZAMBIQUE**



# **Pre-identification of a School Health and Nutrition Component in the Education Sector in Mozambique**

**July-August 2000**

**Annegrete Liljestrand**  
Consultant, Danish Trust Fund

Prepared for  
Cornelis Kostermans, AFTH1  
Don Bundy, HDNED  
Seung-hee Lee, AFTH2



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## ***Executive Summary***

Mozambique is a politically stable country with a rapidly growing economy that is also among the poorest countries in the world. All health and education indicators are lower than in neighboring countries, and HIV/AIDS and malaria are identified constraints on development. In seeking to meet these challenges, the Government has identified a School Health approach as an important response to HIV/AIDS and malaria prevention and as a means to enhance the learning and education achievement of poor children. This situation analysis indicates that Mozambique already has some good experiences in school health programming, but requires a better developed institutional structure and specific national strategy to realize an effective national school health program. The FRESH start approach (based on a framework of health policies, good sanitation, skills-based health education and school-based health services in every school) provides a useful template for developing such a national strategy.

### **1. Introduction**

“Education for All” means ensuring that all children, especially the poor and disadvantaged, have access to basic education of good quality. Poor health and malnutrition are important underlying factors for low school enrolment, absenteeism, poor classroom performance, and early school dropout as reflected in the World Declaration on Education for All. Programs to achieve good health, hygiene, and nutrition at school age are therefore essential to the promotion of basic education for all. In addition to this, prevention of HIV/AIDS in school-age children is urgent, and every effort should be made to reach all children and give them the necessary skills to avoid infection by the HIV virus.

The health status of school-age children in Mozambique is poor, with 70% living below the poverty line, widespread malnutrition, low access to clean water and sanitation and life expectancy at birth declining to 42.3 years. The prevalence of malaria is over 60%, and diarrheas and respiratory infections are frequent. The HIV/AIDS epidemic is growing rapidly with 45% of all new infections occurring among young people aged 15 to 25.

**Table 2. IMR and U5MR in Mozambique and neighboring countries compared with Gross Primary School Enrolment Ratio and Adult literacy Rate**

|              | <i>IMR</i><br><i>(per</i><br><i>1,000</i><br><i>live</i><br><i>births)</i> | <i>U5MR</i><br><i>(per</i><br><i>1,000</i><br><i>live</i><br><i>births</i> | <i>Primary School</i><br><i>Enrolment Ratio</i><br><i>(Gross)</i> | <i>Adult Literacy Rate</i> |             |
|--------------|--|--|---|----------------------------|-------------|
|              |  |  |   | <i>Female</i>              | <i>Male</i> |
| Mozambique   | 147  | 219  | 50  | 70                         | 23          |
| Malawi       | 134  | 213  | 128   | 142                        | 41          |
| Zambia       | 112  | 202  | 86  | 92                         | 71          |
| Tanzania     | 91   | 142  | 66  | 67                         | 59          |
| Zimbabwe     | 69   | 89   | 111   | 115                        | 80          |
| South Africa | 60   | 83   | 115   | 117                        | 90          |
|              |  |  |   | 82                         | 84          |

*Source:* United Nations Population Division, UNICEF, United Nations Statistical Division, World Bank, US Bureau of Census and UNESCO. Update December 1999.

The World Bank (WB) extended its first credit to Mozambique in 1987. In the current Country Assistance Strategy (CAS, May 2000) it supports the Government of Mozambique (GOM) strategy for poverty reduction through sustainable economic growth. There has been a shift of resources and opportunities towards rural areas where the poorest live. Among the key priorities in the strategy are capacity building and developing human resources, including:

- Supporting public sector reform and decentralization
- Increasing coverage and quality in health and education
- Promoting HIV/AIDS education.

In the Education sector the WB is supporting the Ministry of Education (MINED) in the Education Sector Strategic Program (ESSP) with an IDA credit of US\$71 million, closing in June 2004. In the health sector the WB is supporting Ministry of Health (MISAU) in the Health Sector Recovery Program, a sector wide approach, (SWAP) using an IDA credit of US\$98.7 million, closing June 2001.

The objective of ESSP is to provide increased and equitable access to higher quality education. The important role of the education system in health and nutrition has been identified by the Government of Mozambique, and particularly emphasized in the area of HIV/AIDS prevention and malaria prevention. GOM is now considering the development of a school health strategy involving both the Ministries of Education and Health.

The consultant visited Maputo from July 22 to August 11, 2000. The present report is based on visits and information gathered during the mission. The consultant would like to thank all the people and organizations visited for their interest,

collaboration, and commitment towards a better education outcome and health and nutrition status of school-age children in Mozambique.

The objectives of this paper are to:

- Assess the current institutional issues for a School Health and Nutrition component.
- Examine the current programmatic actions in School Health and Nutrition in the country.
- Consider potential actions for a future School Health and Nutrition program in collaboration with UN partners and NGOs.

The appendixes include the following documents:

- A general background,
- An overview of the health and education situation of school age children in Mozambique,
- A list of people met, documents used, and abbreviations,
- The FRESH document,
- The Rationale for Life Skills Programs for HIV/AIDS, and
- Provision through schools of screening and referral services.

## **2. Institutional Issues for a School Health and Nutrition Component in the Education Sector**

### ***2.1 Current Structure of the Ministry of Education (MINED)***

In the ESSP the emphasis on school health was not really reflected in either strategy or written policy. There is no school health unit in MINED. A decision has now been made to create a Department of School Health. This department will be instrumental for information, education, and communication as well as for improving the quality of education. The head of the department is not yet appointed.

### ***2.2 Current Programs Related to School Health***

The ESSP program mainly addresses teacher training with priority given to pre-service and in-service training. The upgrading of 7,600 teachers is needed and an estimated 18,700 new teachers have to be trained. Five teacher-training institutes (IMAP) are under construction. A revitalization of 840 teacher support zones or clusters (ZIP) to provide pedagogical support and in-service training to new teachers and the promotion of school-community relations are planned in the first phase. Teacher resource centers associated with ZIPs will be based in each district.

Twelve thousand schools are currently being constructed, along with related water and sanitation facilities. Several old schools are also being rehabilitated as part of the ESSP.

The number of private schools has rapidly increased in recent years, but they still account for only 2% of schools and are exclusively seen in urban areas.

A gender unit has also been established in the Directorate of Primary Education, promoting girl's education in most provinces and supported by bilateral donors. There are girls education initiatives with scholarships given to 22,000 girls to enable them to stay in school and Girls Promotion Groups which have been established in 47 project schools.

Moslem schools are not uncommon. Muslim children often attend both public and madrassa (Koran) schools.

One NGO, Ajuda de Desenvolvimento de Povo para Povo (ADPP), is engaged in large-scale teacher training. Since 1993 ADPP has started six teacher training colleges for primary school teachers in several provinces with a total of 530 teachers being educated. An additional 250 new teachers will be ready this year. ADPP is planning to start up six new colleges and to increase intake with 120 students per college a year.

UNESCO, in cooperation with MINED and MISAU, is active in 17 schools in six provinces. They provide extracurricular activities in HIV/AIDS prevention and other issues. UNICEF, UNESCO, UNFPA, and several other agencies have also played an important part in the development of the new curriculum, in particular by integrating life skills for hygiene and nutrition education with HIV/AIDS prevention and family life education.

### ***2.3 Policy and Future Plans on School Health***

The Director for Planning, Virgilio Jurvane, of MINED underlined the importance of the SHNP and the need to do more at the strategic and policy level. Coordination with other ministries to promote good nutrition is seen as very important, not only with MINAU but with the Ministry of Agriculture.

The Director stated the need for support from the World Bank and others on how to integrate SHNP in future teacher training. Capacity building for teachers is fundamental for implementation of such a program. Workshops and the use of available Portuguese-language materials in skills-based health education are seen as necessary.

The Director for Primary Schools of MINED, Christina Thembe, saw SHNP as an urgently needed and important tool for addressing the impact on schools of malaria and to focus on HIV/AIDS prevention. She pointed out that when there are important issues such as HIV, they do not have to wait for the completion of curriculum development, and that there are always possibilities for the use of extracurricular activities.

The new curriculum for science will provide **skills-based health education** from first grade, and from third grade will include reproductive health, including family planning and HIV/STD prevention. A pilot project using the new curriculum in the sixth and seventh grades has started in several schools in Zambezia province.

## **2.4 Constraints**

One important obstacle is that the teaching force is not well trained. In the rural areas 25% of teachers still have no training at all, and 40% have only six years of school and one year of training.

The current primary school curriculum is inadequate. A new curriculum is under way, drafted by Instituto Nacional do Desenvolvimento da Educação (INDE) with technical support from UN partners. It is planned to start in 2004.

A general problem is how to attract young women to become primary school teachers. Today only 20% of teachers are women. The initiation of teacher training after tenth grade is seen as one obstacle of many in recruiting young women as primary school teachers.

## **3. Institutional Issues for a School Health and Nutrition Component in the Health Sector**

### ***3.1 Current Structure in the Ministry of Health (MISAU)***

In MISAU there is an existing School Health and Adolescent Division under the Department of Community Health. The division is headed by Ms. Julieta Dimande.

The school health program for Mozambique has existed since 1987, targeting grades one through five. UNICEF supported teacher training until 1993.

A new structure for Community Health went into effect this year, directed by Dr Martinho Dgedge. School and adolescent health is now part of family health and consists of a group of five persons. One coordinator, Dr Della Mercedes Correia, has been appointed and will work with two UNFPA salaried technical staff.

In the new Integrated Community Health Program, School and Adolescent Health (SEA) is to be supervised by MISAU together with the other aspects of the program (nutrition, reproductive health, child health, and adolescent health).

### ***3.2 Current Programs Relevant to School Health***

The German Government aid agency (GTZ) supported MISAU with technical assistance in school health until last year. This included the printing of a brochure with 10 rules for a healthy school.<sup>1</sup> These include the provision of clean water and sanitation, first aid kit, skills-based health education, family life education and HIV prevention, strong community involvement in maintenance of school facilities and coordination with other sectors, institutions, and NGOs. As this support ended last year, follow-up has been slow.

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<sup>1</sup> Saude Escolar. Dez Regras para uma Escola Saudavel. MISAU, SEA. Governo Alemao (BMZ/GTZ), 1999.

There is a written guide for integrated supervision where school health is valued. The supervisor will record the numbers of:

- School health related visits to the school.
- Teachers with capacity for SEA,
- Students with capacity in health education, and
- Schools with improved sanitation and latrines.

And he or she will ask for:

- Existing coordination between SH and other health programs,
- Available material and quality of the activities in IEC,
- What kind of support was received internally and externally in the province, including from NGOs and others, and
- What the problems and the possible solutions.

### ***3.3 Policy and Future School Health Plans***

The new national director, Dr. Martinho Dgedge, has asked the School and Adolescent Health group to present a package of basic activities with norms and standards for the SHNP. The FRESH initiative has been presented, and the group was genuinely interested and supportive. There is a strong overall commitment to and understanding of the need for a basic and effective school health component. It is also planned that the head of the group will initiate a more active collaboration with the MINED.

### ***3.4 Constraints***

Implementation of the program in schools has been problematic due to difficulties in defining the norms and standards regarding what the program should include. Activities have mainly focused on oral health, along with extracurricular activities including discussions regarding health issues and referral of sick students to local health centers. These school health activities have typically been carried out by public health care personnel. There is a severe shortage of trained health care staff in the provinces and districts. The highest priority is for under-five children and reproductive health. Health staff is overburdened and there is little time left for school health.

There are no statistics available on the activities of the school health program.

There is a written agreement (Acordo de Cooperação na área de Saúde Escolar e Adolescente) between the Ministries of Health and Education, signed in 1997. The capacity at central level for follow up to the agreement has not been sufficient.

As already mentioned is it difficult to get a clear picture of both quality and quantity of the existing school health program. However, visits to the provinces for supervision by the chief of the division have occurred.

#### **4. Programmatic Issues**

The international school health initiative, Focusing Resources on Effective School Health (**FRESH**), supported by UNESCO, UNICEF, WHO, and the World Bank, states that ensuring that children are healthy and able to learn is an essential component of an effective education system. This is especially relevant to efforts to achieve “Education for All” in the most deprived areas. Increased enrollment and reduced absenteeism and dropouts bring more of the poorest and most disadvantaged children to school, many of them girls. These children are those who are often the least healthy and malnourished and who have the most to gain educationally from improved health. Effective school health programs that are developed as part of community partnerships provide one of the most cost-effective ways to reach adolescents and the broader community and are a sustainable means of promoting healthy practices.

Focusing resources on the school-age child responds to a new need where today many more children previously beyond reach are going to school and increases the efficacy of other investments in child development. It is also known to be a highly cost-effective strategy. School health programs help link the resources of the health, education, nutrition, and sanitation sectors in an infrastructure—the school—that is already in place, is pervasive, and is sustained.

Coverage of the school system is often superior to the health systems and has an extensive skilled workforce that already works closely with the community. The high effectiveness of these programs is a consequence of the health benefit *and* the educational benefit.

The core framework for action in FRESH are the following four components that should be made available together in all schools.

1. Health related school policies
2. Skills-based health education
3. Provision of safe water and sanitation—the essential first steps towards a healthy physical, learning environment
4. School-based health and nutrition services

In the following, the four categories are used as a framework to examine and discuss the situation in Mozambique.

##### ***4.1 Health-related School Policies***

It is difficult to get a clear picture of current health-related school policies in Mozambique and above all how they are implemented.

Regarding **reproductive health**, there has been a debate<sup>2</sup> on the definition of policies for reproductive and adolescent health. The participants were ministers from MISAU and MINED, national directors, chiefs of departments, and health directors from

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<sup>2</sup> Debate sobre a definicao da politica de saude reproductiva dos adolescentes. Maputo 21-22.04.1999

all provinces, among others. The participants agreed that it was better in the current situation to not have a formal policy on reproductive health issues for adolescents.

There is a **legal age for marriage** of 16 years with written consent of both parents. Policy states that **pregnant girls** can stay in school. However, in rural schools, traditional practices prevail. Pregnant students frequently drop out, and will be discriminated against if they remain in school. Parents may not allow a girl to continue in school after she has reached "menarche," as she is then believed to be ready for traditional union. It is not uncommon that children in both rural and urban areas in Zambezia Province become sexually active between 8 and 12 years, according to a recent study from September 1999.<sup>3</sup> There is awareness that sexual activity may be initiated as a form of childhood play and may lead to a means of exchange for money/goods with older men.

**Sexual abuse** and sexual activities between teachers and students is prohibited by law. Thirty-one percent of primary school teachers are not in favor of this law according to a study conducted (*Estudo sobre o Estatuto do Professor do Ensino Primário em Moçambique, 1997/1998*). That teachers use their power to abuse children in different ways is common, as testified by 38% of students.

Policies that a person **infected by HIV** can keep his job are in place, but testing for HIV is not readily available, and the awareness of infection is still low. In many rural areas people do not believe that AIDS exists, and children often think of it as an adult disease.

A Child Rights Resource Center was founded in December 1999, and an implementation strategy for child rights issues with policies relevant for school health is being promoted by both UNICEF and several NGO's. The Ministry for Coordination of Social Welfare, UNICEF, and WHO have conducted a review of the Civil Code in relation to the Convention on the Rights of the Child (CRC) and found that many laws are in conflict or contradiction with the CRC.

Schooling is free of charge. In reality, money, gifts, or (sexual) services are generally used as payment to teachers for passing from one grade to the next. Teachers also provide "necessary" extra lessons for payment.

The policy that **tobacco** use is prohibited in all schools along with drugs and alcohol is well known.

#### **4.2 Skills-based Health Education**

This approach to health, hygiene, and nutrition education focuses upon the development of knowledge, attitudes, values, and life skills needed to make and act on the most appropriate and positive health-related decisions. Research shows that in all

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<sup>3</sup> Research on the Vulnerability of Children to STDs, HIV and AIDS in Zambezia Province. 1999  
MISAU,UNICEF,SCF-UK,

countries the gap between knowledge and behavior is wide and that skills are far better predictors of behavior than knowledge and attitudes.

As part of its contribution to the National Strategic Plan on HIV/AIDS, the education sector has committed itself to introducing Life Skills, Family Life, and HIV/AIDS communication training package in all upper primary schools effective by 2000.

In today's primary school curriculum there is very little health education. In secondary school, some reproductive and hygiene education is given in natural science.

**Family life education**, implemented by INDE/MINED and executed by UNFPA as a pilot study for the new curriculum, has started in five schools in Zambezia in grades 6 and 7 only. The experience has been very positive and well received by the communities and parents. Skills-based health education for improving healthy lifestyles is included. In addition to this, 83 school activists were educated among students and teachers to disseminate information as peer educators through film, theatre, brochures, and talks.

The lessons learned from the pilot study were presented at the UNFPA mid-term review.

The lessons underlined:

- The importance of informing parents and the need to have community acceptance of family life education.
- Content must be explained in the local language, taking into account local culture and traditions.
- Teachers need to be good role models, and female teachers are important to provide skills-based health and family life education.
- Ministries have to be more involved and active in the process.
- There is a need to start family life education by grade 3.

The pilot project will expand this year to several schools in Maputo. There is a general opinion held that the program should be expanded to cover the whole country, using the lessons learned, and that there is no longer a need for prolonged pilot studies.

One problem noted is that teachers do not have much time for in-service training. There are also problems with continuation due to the fact that well-trained teachers have been transferred to other schools.

**UNESCO**, in co-operation with MISAU and MINED, is active in 17 schools associated with UNESCO, situated in six different provinces. They give extracurricular activities in civic education and HIV/AIDS prevention using drama, film, and discussions. These activities are known to be very popular and attractive to students. It is not known the number of activities or students who have benefited from the program.

To reach both in-school and out-of-school youth, **Adolescent Friendly Health Services**, have started up in Maputo and Quelimane (Zambezia) to provide counseling, STD treatment, contraceptives, HIV/STD prevention, and gender and family life education. There are plans to extend these services to five districts in Zambezia in the current year. The NGO AMODEFA<sup>4</sup> has a similar service in Quelimane for boys. Activities in Gaza and Tete are also planned.

These services are supported by MISAU, MINED, Ministry of Youth and Sports, the Ministry of Culture, and the Ministry of Social Affairs and Women. Many different NGOs are active and Pathfinder/UNFPA are technical advisers.

The objectives of this reproductive health program respond to MOH strategies and plans as outlined by PNI.

Ajuda de Desenvolvimento de Povo para Povo (**ADPP**) is an active Mozambican NGO engaged in teacher training. Fifty percent of their activities are paid by the selling of used clothes and the rest comes from outside funding. The NGO selects their students after grade 10 and trains them for two years using pedagogically advanced methods. The drop out rate in this program is low and the teachers go back to their own districts. They are supervised regularly during the first year. The teachers from this program have good knowledge of local language and culture. A central part of the curriculum is that teachers see themselves as role models for the community. Four subjects/lines for community involvement with teacher/parent activities are in place: community leader, basic health and nutrition, women's advocate, and entrepreneur. Regular in-service training occurs two times per year during vacation.

ADPP teachers are also engaged in informal adult education. ADPP teacher training is fully accepted by the GOM and the training is seen as a model for Government Teacher Training Institutes (IMAP).

All 530 teachers educated from ADPP teacher training colleges have had in-service training at the training colleges in skills-based health education. Two hundred fifty new teachers have received the same training using newly published materials (in Portuguese) in skills-based health education.<sup>5,6</sup> The material has been produced with technical assistance from UNICEF and is of high pedagogical quality with many easily understandable illustrations that make it possible to use with illiterate people. Teachers from ADPP colleges are currently creating youth clubs in the district where they work. These clubs target out-of-school youth and include HIV prevention, safe sex education, and education on malaria, diarrhea, and hygiene. The material will be used in primary schools. The teachers are waiting for confirmation from MINED to begin use of the

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<sup>4</sup> AMODEFA, Associacao Mozambicana para o Desenvolvimento da Familia. NGO with activities in family planning, reproductive health, civil education and HIV/AIDS prevention.

<sup>5</sup> A luta Contra o SIDA na Communidade Local, Livro 1 do projecto Habilidades para a Vida ADPP Mozambique 2000

<sup>6</sup> Melhor Saude na Communidade Local. Livro 2 do Projecto habilidades para a Vida. ADPP Mozambique 2000.

material as part of the new curriculum. It is worth noting that the clubs (800 to be created) have been very popular.

ADPP has additional capacity to conduct in-service training for skills-based health education for other government teachers if additional funding is provided. ADPP wants to expand their activities, and there is widespread opinion that the quality of their education and training is high.

A joint **UN Foundation** project has been approved for US\$3 million in Zambezia Province through the Ted Turner foundation.<sup>7</sup> The project will start this year and run for three years, monitored by UNAIDS with the following objectives:

- Introduce and support quality youth friendly integrated health services in at least 12 facilities in 12 selected districts in Zambezia( UNICEF and UNFPA).
- Increase access of adolescents (focus on age group 10 to 14) and youth in general to lifesaving information and skills through improved in-school life skills and sexual education, and intensified in- and out-of-school peer education and communication programs(UNICEF,UNESCO, and UNFPA).
- Raise public awareness on HIV/AIDS and develop community capacity to prevent HIV/AIDS and better cope with its impact (UNICEF and UNFPA).

The project works with several NGOs, and the national counterparts will be provincial authorities, central level ministries, and local NGOs. Partnership from the World Bank in this project is welcomed.

This activity is not yet in the implementation phase, and GOM has not been very active in guidance or project planning.

**UNICEF** is to provide a kit to raise HIV/AIDS awareness among teachers and children, with HIV prevention material (condoms, HIV information, different material used for teaching). The kits will be distributed to 40,000 teachers in primary schools by October 2000.

**Save the Children US** is starting a new program in Gaza Province, Xai Xai and Bilene, with child-to-child HIV prevention activities in 10 schools. They will use school infrastructure and teacher support for this new program.

Several other NGOs have activities ongoing using IEC strategies in family life and HIV/STD prevention. They are in place in several provinces.

It is an expressed concern that there are too many NGOs working in the field and there is a need to address sustainability and to come up with criteria as well as national norms and a framework for NGO work. USAID has decided to contract only one NGO (after competition for grants) per province to limit the number of organizations active in the field.

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<sup>7</sup> Joint UN Support to the Provincial HIV/AIDS Operational Plan of Zambezia-Mozambique. Project review form, June 2000

#### **4.3 Physical Environment**

Components of the curriculum concerning hygiene are taught in primary schools, albeit not in a participatory manner, and the quality of education is unknown. The new curriculum being prepared is to start in 2004 and includes a comprehensive participatory curriculum planned from the first grade and in the local language on the importance of safe water, sanitation and hygiene in nutrition.

Hygiene education is meaningless without clean water and adequate sanitation facilities. By providing these facilities, schools can reinforce health and hygiene messages and act as an example to both students and the wider community. Sound construction policies will help ensure that facilities address issues such as gender access and privacy.

Within the framework of ESSP, 12,000 classrooms will be constructed and rehabilitated during the next five years. This will increase the existing stock by sixty-two percent. Eighty-seven percent of new classrooms will be in rural areas of provinces with the highest priority. A rural community school with 200 pupils will have 2x4 latrines, separate according to teacher/student and by gender. In addition to this a borehole/well with hand pump will be provided. In other schools the provision of a safe environment varies widely. In many rural areas there are frequently no facilities of this kind.

Several schools in the area of Maputo were observed to have flooded areas instead of playgrounds around the school building, with the consequent high risk of malaria and spread of infectious disease. School children often lack tables and chairs and sit on the floor in overcrowded rooms.

An assessment of the physical environment in all public schools is needed along with a general plan for improving the current situation. To monitor this, an integrated supervision, as planned, by MISAU is necessary.

Community capacity development is seen as an important way to improve both dissemination and implementation of the National Sanitation Strategy and National Water Policy. The ESSP will gradually introduce a Community School Program that puts the community in the center of school construction and maintenance.

Many bilateral donors, NGOs, and the civil sector are doing important work in this field, and progress is seen in both schools and communities. Of the 5,000 classrooms constructed during the past five years, communities contributed 55% and NGOs 30%, leaving MINED with a share of 15%, financed from IDA credits.

Absenteeism often results from a low level of hygiene and sanitation (with diarrhea and malaria as a result). Other activities which are family related—harvest, childcare, hunting, etc.—also cause absenteeism.

#### **4.4 School-based Health and Nutrition Services**

Schools can effectively deliver some health and nutritional services provided that the services are simple, safe, and familiar, and address problems that are prevalent and recognized as important within the community. If these criteria are met, then the community sees the teacher and school more positively, and teachers perceive themselves as playing important roles.

There are few experiences in the country of school-based health and nutrition services. There is a general interest and understanding at the government level that simple efficient, cost-effective, school-based health and nutrition services could be implemented quite easily. Treatment of malaria in times of high transmission, causing high absenteeism, is seen as a priority. In-service teacher training would be necessary.

Save the Children US, funded by USAID, started a school health service program in Gaza province in 1998. A preliminary study of parasitic infections was conducted in four schools, and 155 student were tested with urine and stool samples. Of these students, 37% had intestinal parasites, and 39% had schistosomiasis. A broader baseline study was conducted in 20 randomly selected schools with 50 fourth grade students (12 to 18 years of age) in each. The prevalence of worm infection among the 998 students was 30.5%, and 32.8% had schistosomiasis. The prevalence of anemia, general physical health, frequency of consumption of nutritious foods and knowledge attitudes, and practices related to general hygiene, infectious diseases, nutrition, and reproductive and sexual health were also assessed. After that a schistosomiasis questionnaire was filled in by 51,494 students conducted by 623 trained teachers in 121 schools. In all schools that self reported a 30% or more infection rate, mass treatment of students was conducted. Treatment schemes for schistosomiasis were started, and a workshop was planned for introducing health awareness programs in schools. A total of 10,129 students received treatment. The result was presented in 1999 for MISAU and MINED and at provincial and district level<sup>8</sup>.

The program ended abruptly two months ago (May 2000) due to a lack of funding. Currently there are no activities of this kind in the mentioned schools. There is a general sense that school health was not seen as a priority at the peripheral level. A contributing factor was that teachers felt overburdened due to the recent floods.

UNICEF has school health as an integrated part of their country program. They mentioned difficulty in reaching agreements at the national level and slow progress in cooperation between ministries. UNICEF has now decided to go ahead with school-based services in the most flood affected areas in Gaza province. To engage directly with the provincial level has shown to be easier due to the flood emergency, and this has led to increased implementation of programs at the provincial level. The program, which includes teacher training, is to begin as soon as possible, and activities scheduled include malaria prevention and treatment, iron, de-worming, and use of iodized salt.

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<sup>8</sup> Year one Summary Report. School Health Initiative. Gaza Province Mozambique. Save the Children/US. 1999.

**UNICEF** is also planning home-based treatment for malaria. This is already done by the Mozambican Red Cross using around 2,400 trained volunteers (see below). It requires policy change and new guidelines for first treatment of malaria using chloroquine. Well trained teachers will be active in providing treatment, and all communities will be engaged. Active supervision of Red Cross “primeiro socorros” is also planned.

**Mozambique Red Cross (CVM)** is cooperating with MISAU and MINED. They train and support 2,400 unpaid volunteers as “socorristas”(first aid) in all provinces. Most often the socorristas are active where there is no public health activity and no health post. During three intensive weeks, they are trained in community work and preventive health care before they get their first aid kit. They treat malaria with chloroquine and are also able to treat conjunctivitis, anemia, and provide vitamin A. There is a relatively high turnover, but most volunteers take part for around two years. The program is made up of around 50% women, who tend to commit longer. The resources available for CVM vary from time to time but the work of the volunteers is highly valued.

**World Food Programme (WFP)** has for the last six years provided feeding of students in 173 secondary boarding schools and 80 day schools, the target population being 57,000 persons. It also provides monthly food rations for 5,000 teachers in both boarding and day schools

WFP is planning to start a school feeding program in all 495 schools that provide sixth and seventh grades. Feedings will include breakfast and lunch. The goal is to attract girls so that they will continue in school. The program is part of a US\$300 million USAID initiative

WHO is planning a malaria prevention education program with extracurricular activities in seven UNESCO-associated schools. There are still no funds available.

## **5. Potential Future Activities**

It is clear that there is political support for school health in Mozambique. Both MINED and MISAU see the importance of school health for Education for All and also recognize the school as an important conduit for HIV/AIDS and malaria prevention.

The situation analysis indicates some actions that might be taken to move towards an effective countrywide School Health and Nutrition Program.

### ***5.1 Institutional***

Both MINED and MISAU are now developing units for management of school health. It is unclear at this stage whether they share a common vision and work plan. Their relative roles also seem to be somewhat undefined. MISAU plans to deliver school health as part of community health, but it is unclear whether sufficient personnel and resources will be made available to reach all schools—especially when the school-age group is a secondary priority (after under-five children and maternal health) for this ministry.

Evidence from other countries suggests that no country in Africa has successfully sustained health care for all school children—particularly poor rural schoolchildren through an MOH “school visit” approach (see Appendix G).

On the other hand, there are now successful examples of teachers playing an effective role in service delivery, provided the services are simple, safe, and familiar. Thus, MINED could work with MISAU to reach more children.

The institutional structure to manage this approach can take the form of a unit of the MINED collaborating with MISAU, or a unit of MISAU seconded to MINED. These options might be considered in Mozambique.

A particularly useful approach to develop a cross-sectoral unit has been the creation of a written protocol setting out the specific responsibilities for each ministry. The need for complete transparency as to who is responsible for what is required.

The new curriculum for primary schools will provide participatory and skills-based training from first grade in hygiene, nutrition, and sanitation using the local language and culturally appropriate information. There is both opportunity and need to include malaria prevention, as already underlined by the Director for Primary Schools. HIV/AIDS prevention and family planning education is scheduled to start from third grade. The current threat from the HIV epidemic suggests a need for a fast track in including prevention of HIV/AIDS in schools where most children can be reached. Using the life skills approach for HIV/AIDS prevention has been shown to be very effective in many countries (see Appendix E).

### ***5.2 Policies***

Mozambique has developed progressive school health policies, but there is a need for a communication strategy to raise awareness of these policies in the communities and among students, parents, and teachers. Increased transparency is a potentially very powerful tool to gain general acceptance of health-related policies. For example, laws address potential harassment by teachers of students, yet information suggests it occurs frequently. Clear communication of child rights to teachers and parents can help demonstrate that MINED is concerned about the situation and can encourage the communities to act against these occurrences. This example is chosen due to the obvious importance of exemplary behavior by teachers, but policies can be helpful for influencing a broad range of behaviors, including smoking.

### ***5.3 Environment***

The ESSP has made a concerted effort that adequate water and sanitation is provided in all newly constructed schools.

Best practice indicates that sanitation is only effective if there are separate facilities for teachers and children. If not, the facilities will be monopolized by the teachers. The absence of privacy is a well known factor for girls absenteeism. Separate

facilities for girls, particularly adolescent girls, are an important contributing factor to reducing dropout at menses and beforehand.

The maintenance plan for keeping facilities in order should be a responsibility for the local community and is part of the ESSP Community School Program. Strong community involvement is known to be the only sustainable option in keeping the facilities maintained.

#### **5.4 Life Skills**

There has been real progress in starting up skills-based health education in schools. It is a clear priority area because of the threat of the HIV/AIDS epidemic and the huge impact of malaria on the school system.

The main preoccupation regards the means to achieve national coverage in the shortest time possible and how a sustainable strategy can be maintained.

The ESSP assigns the highest priority to pre-service and in-service teacher training. The teacher training program is complemented by a vast expansion in the in-service training program under the Teacher Improvement Institute and the revitalization of the pedagogical zones (ZIPs). During the next five years, 15,000 untrained teachers will be upgraded and an additional 6,000 trained teachers will improve their qualifications. Training in life skills will certainly be part of the teacher development program and is thus convergent with potential future activities in school health. However, a faster rate of training may be required to ensure rapid national coverage of HIV/AIDS prevention.

Consideration should be taken in how best to strengthen the existing infrastructure and how to accelerate implementation. This may be a role for the NGOs.

#### **5.5 Services**

There is significant experience in de-worming and malaria treatment by teachers in Mozambique. This approach has been used effectively in other African countries. This needs to be expanded by a national strategy that would require procurement of needed drugs and teacher development as discussed above.

## **Appendix A**

### ***A.1 Introduction***

Early childhood programs, ECD, and primary schools which improve children's health and nutrition can enhance the learning and educational outcomes of school children. Primary and secondary education of good quality can lead to better health and nutrition outcomes, especially for girls and the most vulnerable and poor students in rural areas, and thus have a positive impact on the next generation. In addition, a healthy, safe, and secure school environment can help protect children from health hazards, abuse, and exclusion. (DHSs have shown consistently that health outcomes of children of women with some education are better than among children of mothers with no education at all.)

School health programs are known to be most effective when close collaboration and support from the community exists, including that between parents and teachers and child to child, thus also reaching out of school children.

Joint analysis by UNICEF, WHO, UNESCO, and the World Bank has identified a core group of cost-effective activities which form the basis for intensified joint action to make schools healthy and friendly for children. The partnership is called Focusing Resources on Effective School Health (FRESH).

The important role of the education system in health and nutrition has been identified by the Government of Mozambique (GOM), and this has been emphasized in the area of malaria prevention and HIV/AIDS prevention. GOM recognizes the urgency of the threat of the AIDS epidemic on the education system and is strongly committed to the introduction of preventive activities in all primary schools as soon as possible.

GOM took part in the World Education Forum in Dakar April 2000, where the FRESH start approach was launched, and is well aware of the initiative. The new curriculum for primary schools, which is drafted, has a strong skills-based health education component. The Education Sector Strategy Reform (ESSR) sees good health and nutrition of children as important for reaching the development objectives. The "Integrated Community Health Program"(PNI) of the Ministry of Health has identified school health as an important part of that program.

### ***A.2 General Background***

This year Mozambique is celebrating 25 years of independence. Many years of civil strife, which ended in 1992, have had a devastating effect on the infrastructure of the country. Many health centers, hospitals, and 3,400 schools were destroyed or closed during the civil war. More than 500,000 people migrated inside the country, forming poor peri-urban areas and leaving many families without contact with their home district.

The economy has grown steadily since 1992, with growth in 2000 expected to be 7%. Inflation has remained low in recent years, and was 2% in 1999. Democratic elections have been held, the latest in 1999, won by the ruling FRELIMO party. Mozambique received debt relief through the HIPC initiative in 1999, worth US\$1.7

billion in today's values. This will help the GOM to enhance the social benefits of good economic management and sustain increases for spending in social development.

In 1999 Mozambique had a population of 16.99 million living in 10 provinces with 70% living in rural areas. Around 19% of the population is between 6 and 12 years and 11% between 13 and 17 years. The most populated province is Zambezia with 2.89 million people.

Portuguese is the official language but it is spoken by only 40% of the population and by 30% of women. As few as 8% speak Portuguese as their mother tongue, this is true for only 2% in rural areas.

Census figures estimate that 24% of Mozambicans are Catholic and 17.8% are Moslems. However, it is generally believed that there are around 30% Muslims. Seventeen and one-half percent belong to the Zionist church. The remainder are indigenous African religions and a small Hindu community.

Life expectancy at birth in 1997 was extremely low at 42.3 years. Inequity in the country is significant with life expectancy in Zambezia Province at 38 years compared to 62 years in Maputo. Total fertility rate is high at 5.6, with little difference between rural and urban areas. For women with secondary education total fertility rate is 3.7. The annual growth rate of the population in 1997 was 2.5, with a high dependency rate.

Adult literacy is very low at 39.6 with only 15% of women in rural areas being literate compared to 44% of men. In Maputo 77% of women and 93 % of men are literate.

In spite of rapid economic growth Mozambique is still one of the poorest countries in the world with the Human Development Index placing it as number 169 of 174 countries. The income per capita in 1998 was as low as US\$210 compared to the average for Sub-Saharan Africa of US\$480. Around 70% of the population are living below the poverty line with significant inequity: 88% are poor in Sofala province compared to 48% in Maputo.

### ***A.3 Ongoing Reform Processes***

The centralized model of public governance initially implemented by the ruling party, and thereby by the government, is gradually giving way to a reform process including both decentralization, civil sector reform, involvement of civil society in general and NGOs in particular, and privatization of certain areas. The decentralization efforts include strengthening of the normative functions of the ministry (in this instance, the Ministries of Health and Education) simultaneously with helping to plan, coordinate, and learn from other providers in the respective sectors. Strategic efforts are now under way to strengthen district level development, also permitting multi-sector work at that level. Examples of such cooperative actions to improve health are school health (school and health sectors), improvement of food safety (agriculture, trading, customs, health), and action against HIV/AIDS (schools, health, private companies, truck companies, etc.). The ongoing civil sector reform process will need several years to be completed, but

evidently the failure to earn a wage that can sustain a family is a major problem for all public staff in the education and health sectors, leading to poor services and the potential for unofficial “fees” and corruption.

#### ***A.4 Health and Nutrition Status of School Children***

##### ***A.4.1 IMR and U5MR***

The main health indicators for children under 5 years show IMR at 147/1,000 ranging from 60/1,000 in Maputo to 192/1,000 in Zambezia. The U5MR at 219 is equally high and much higher than in neighboring countries (see Table 1).

Inside Mozambique important inequity is seen with huge variation in U5MR. The highest rates are seen in Zambezia where 321/1,000 die before the age 5 compared to Maputo where 92/1,000 do not survive. The rates have not changed significantly during the last 10 years, as far as it is known, but the in 2001 upcoming DHS will shed light on this.

##### ***A.4.2 Reproductive Health***

Maternal mortality rate is very high, estimated at 1,500/100,000 births. The main causes are extreme poverty, very poor living conditions, and low educational and social status of women and lack of access to appropriate health care.

Access to delivery with trained health personnel has risen significantly in the latest years but is still low at 42%, with few deliveries in hospital.

Teenage pregnancy is frequent. Of 1,000 adolescent girls age 15 to 19, as many as 173 give birth per year according to census 1997. The rate has not changed over the last decades. In rural areas, sexual initiation often starts at the first menstruation or around 12 years of age. Many girls are then seen as ready for union and marriage. Young mothers under 15 are not uncommon but the fertility rate in this age group is not known. Pregnancies in young girls have a higher mortality risk for both mother and child.

Abortion is legal only when pregnancy poses a health risk for the woman. Unsafe abortions are common.

The use of modern contraceptives is very low, with a contraceptive prevalence rate of 0.6 to 6% in rural areas and 20 % in urban areas.

There are many positive ongoing activities in prevention of early pregnancies and HIV/STD. Youth friendly reproductive health clinics for adolescents have opened since last year with five clinics in Maputo and five in Quelimane, served by well-trained nurses. There has been a rapid increase in new visits and the program is planned to expand to other provinces. NGOs working in the same field include AMODEFA (a Mozambican NGO for family planning), MONASSO (a network of NGOs working with HIV/AIDS), and Pathfinder.

#### *A.4.3 Main Causes of Mortality and Morbidity*

**Malaria** is endemic in all of Mozambique and is the most important cause of mortality and morbidity among schoolchildren. It accounts for 48% of total patient attendance and 29% of hospital deaths. The prevalence among schoolchildren is 60 to 80%, and malaria is the most common cause of absenteeism in schools for both students and teachers.

Chloroquine is the drug of choice for first line treatment. Resistance to chloroquine in urban areas is known to be a problem, especially where the transmission rate is high.

The use of insecticide impregnated bed nets is low, but the knowledge of the benefits and use is spreading in the country. The cost of bed nets is not affordable for most Mozambicans. There is a need to improve knowledge of malaria prevention, such as recognition of common symptoms and signs, and when to seek treatment for the disease. Access to treatment in remote rural areas is low with health centers often more than 25 km away.

Skills-based health education in and out of school is in general seen as an important way to encourage use of bed nets and other preventive measures and for recognition of environmental risks. Such education will also provide children with the ability to perceive symptoms and when to seek treatment for malaria.

Many activities both in malaria research and in malaria treatment by civil society (often by NGOs with trained volunteers) outside the public health system are in place. The country has a National Malaria Control Program, which plans, and coordinates donor activities. The capacity of the program is not sufficient due to the lack of staff with management skills.

The **HIV/AIDS** epidemic is expanding very rapidly in Mozambique. In 1999 an estimated 14.5% of the adult population was infected. There are variations inside the country, with the prevalence rate in the center (Sofala, Manica, Tete, and Zambezia Provinces) at 22%. This is due to close contact with neighboring countries where prevalence rates are much higher, thus constituting a corridor for rapid spread of the infection. After 1992, infected refugees from Zimbabwe and Malawi returned to central Mozambique. Forty-five percent of all new infections occur among young people aged 15 to 24. The extent of unprotected sex with casual partners is high, and commercial sex constitutes around 30% of casual encounters. Many young people, especially in rural areas, are known to be unaware of the risk linked to unprotected sex. Condom use is still low but growing steadily. The estimated number of orphans in the country, due to the epidemic, is 250,000. Mother-to-child transmission is high, accounting for an estimated 120 new cases per day in 0 to 4 year old children.

The country has been slow in starting up a countrywide HIV/AIDS prevention program. In many rural areas the disease is not seen as a real threat. HIV prevention is not yet in the national school curriculum, but there are many activities in place by NGOs and civil society with peer education in schools and extra curricular activities.

The AIDS epidemic in the country is capable of wiping out all improvements achieved in recent years, and the threat to the economy and social development in the country is enormous. An impact study on the effect of the epidemic on the education system is being carried out during the coming months.

During 1999, strong efforts were made to develop a realistic National Strategic Plan. A National Commission on HIV/AIDS has been set up to coordinate all information and preventive activities by Ministries, donors, and MONASSO- the network of 50 or more NGOs working on HIV/AIDS prevention in the country. The National Commission, headed by Ms Janet Mondlane, will consist of four senior people. The posts, with competitive salaries, are currently being advertised. The World Bank has contributed an additional US\$250,000 for first-year start up costs. The Commission held the first donor meetings in the beginning of August 2000.

Expectations are high regarding the program, but there have been and still are many difficulties, including the introduction of HIV/AIDS education into the school curriculum.

**Respiratory infections** and **diarrheas** are a common cause of morbidity, mainly because of poor sanitation and low knowledge of hygiene. A recent national survey showed that 32% of the population had diarrhea during the previous two weeks.

The program for Integrated Management of Childhood Illness (IMCI) will soon start in several provinces and is expected to improve case management and health seeking behavior in the community.

**Bilharziosis and other parasitic diseases** are also known to be common conditions among schoolchildren, but prevalence varies in the country. Data are only available from small area based studies.

**Abuse and violence** is increasingly discussed and is shown to be common, with both boys and girls as victims. A recent study<sup>9</sup> in four secondary schools in Maputo shows that 18.8% of girls and 6.7% of boys had experienced coerced sex even in ages below 13 years. Thirteen percent of children under 13 have been beaten. Two national NGOs, Associacao Mocambicana Mulher e Educacao (AMME) and Associacao Mocambicana das Mulheres de Carreira Juridica (AMMCJ) are doing important preventive work in this field. Still, most of the activities are located in Maputo where female teachers active in AMMEA give counseling and support to victims. A house where victims are provided shelter and safe environment was recently opened in Maputo and is supported by Switzerland. A march against domestic violence is prepared for September 2000, and a law against violence against women and children is to be drafted.

**Injuries** are today the most common cause of death among young men in Maputo. Landmines are still a significant threat in many rural areas.

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<sup>9</sup> Estudo CAP nas Escolas: Conhecimento, Attitudes, Practicas e Comportamento em Saude Sexual e Reproductiva em uma Era de SIDA. Projecto Moz/98/P04 FNUAP

#### *A.4.4 Nutrition*

Malnutrition is widespread, and chronic malnutrition is seen in 40% of young children and is a significant overall cause of mortality and morbidity. Among children with mothers with a secondary school education, 9% were malnourished. Lack of knowledge of appropriate feeding practices and lack of diet diversity are some of the causes to malnutrition. Food security is affected by seasonal weather patterns, and the recent floods have worsened the situation in the affected provinces. Mozambique has good agricultural land and is self-sufficient in food production. The potential for improving production of basic food is very good (the fact that malnutrition is highest in the “bread baskets” of the country shows that food shortage per se is not the main factor causing malnutrition).

Micronutrient deficiencies are common. Vitamin A capsules are given as part of the Expanded Program of Vaccination, which has been very successful. Iron deficiency with anemia, secondary to malnutrition, recurrent infections of parasites and malaria are common in school children.

Severe iodine deficiency is seen in endemic inland areas and total goiter rate is high, around 20% in several provinces. In 1999 only 32.6% of school children were using iodized salt, and in the north the use was only around 5% according to a school based survey.<sup>10</sup> A national program for use of iodized salt started in 1999.

Mozambique has a Food Security and Nutrition Strategy, and the secretariat, based in the Ministry of Agriculture and Rural Development, has a multi-sectoral approach.

#### *A.4.5 Water and Sanitation*

Access to clean water is low. In rural areas, only 37% have access to safe water, compared to 85% in urban areas. Sanitation in rural areas is as low as 26% and in urban areas 68%. A study in Nampula and Zambezia Province in 1999 showed that 70% of identified diseases were water and sanitation related. Open defecation was practiced by 73% of the study population. Eight-five percent of the people interviewed collected water from unprotected sources.

Water, sanitation, and hygiene promoting programs as part of the National Water Policy are active in all provinces with support from many donors and NGOs, and progress is seen in many places. A strong community capacity development is the core for all such activities.

#### *A.4.6 Access to Health Care*

The civil war was a disaster for the health infrastructure, and many health centers were destroyed. A Health Sector Recovery Program began in 1995, and over 150 new health centers have been built. The access to health care of good quality is still low and many people cannot afford to pay the nominal fee. Inequity in the country is significant. Maputo has about seven times more resources—nurses, doctors, health facilities, and

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<sup>10</sup> Use of Iodized salt in Mozambique, 1999. A School-based survey

public expenditure on health—than the poorest part of the country. This inequity has been addressed for several years, with increased spending going to the northern provinces. People in the most remote areas have a mean distance of 26 km to the nearest health center for first-level care and 43 km to the nearest doctor.

The infrastructure of the health system is struggling with poor equipment and insufficient maintenance of facilities. There is still a shortage of personnel at all levels but the training institutes for nurses and midwives and the Faculty of Medicine are of good quality and are steadily increasing the number of trained personnel.

#### *A.5. Education of Children and Adolescents*

The Education Sector Strategic Program (ESSP) started in 1997 with the objective of providing increased and equitable access to higher quality education through improvement in the management of education to promote economic and social development.

Basic education has moved forward during the last years and the percentage of 6 to 12 year old children in primary schools (net enrolment) has increased significantly. There are differences among provinces. Maputo has 59% enrolment and Nampula only 32% (1997). The gross enrolment rate increased in lower primary school from 54% to 67% between 1992-97. Only 25% of children complete fifth grade without repetition, and 7% complete fifth grade with repetition. In general, the provinces with highest repetition rates have the highest drop out rates. Girls are less likely to attend school, especially in the poorer north, but do account for 44% of primary school students.

Around 2.5 million children today attend primary school low level, EP1. Enrolment drops sharply in sixth to seventh grades, EP2. Secondary school enrolment has increased steadily from 34,000 students in 1994 to 52,000 in 1997. Most secondary schools are boarding schools.

There are an inadequate number of schools, and some do not include up to five grades. The distance to school, in particular upper primary (grades 6 and 7), is often too far for children to walk. Because of the low number of schools, there are often three shifts per day, and the learning hours have thereby decreased by 30%. This means that students may attend school for only three hours a day, leading to decreased quality of education. The low quality of primary and secondary school education is therefore an important concern to address.

The dropout rates for lower primary school, EP1, is 9% and for EP2 7% and are equal for boys and girls. There are different reasons for drop out among boys and girls. Among girls 17% tend to drop out because of marriage, 22% are unable to pay monthly costs, 6% leave because of pregnancy, and 5% need to help the family. The reasons for boys to drop out is mainly the need to help the family in earning money and inability to pay monthly costs. Distance to school is also seen as a reason for drop out. In remote rural areas education of girls beyond the fifth grade may be seen as unnecessary since girls of that age are considered old enough to marry.



## **Appendix B: People met:**

Dir. Juvane MINED  
Dir. Christina Thembe MINED  
Dir Simao Mucavele INDE  
Ms Helena Xerinda INDE  
Ms Julietta Dimande MISAU  
Ms Cristina Albasine MISAU  
Ms Ivone Zilhão MISAU/UNFPA  
Ms Angelika Schrettenbrunner  
MISAU/GTZ  
Ms Maria Lordes Fidalgo  
Nutrition/MISAU  
Ms Carina Ismaier Nutrition/MISAU  
Mr.Kalenka Paluku WHO  
Mr Chandana Mendis WHO  
Ms.Maria da Gloria Moreira WHO

Mr Augusto Nunes National Comission  
of UNESCO  
Mr Philippe Degernier WFP  
Mr Cooper Dawson UNICEF  
Ms Atieno Odenyo UNAIDS  
Ms Ordetta Cossa UNFPA  
Ms Zaida Cabral SNPM  
Ms Annie Foster Save the Children US  
Ms Birgit Holm ADPP  
Ms Ernestina Jama CVM  
Mr Robin Bovey Red Cross Federation  
Mr Jose de Codes Pathfinder  
Ms Nafissa Osman Youth Friendly  
Clinic  
Mr Michael Holmes Tete DPE  
Ms Lise Kaalund Joergensen DANIDA

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7. GOM, Informação Estatistica Sumária, 1999
8. GOM Plano Estrategico Nacional de Combate as DTS/HIV/SIDA, 200-2002, 1999
9. GOM Mozambique Inquérito Socio-Demográficos e de Saúde 1997,INE 1998.
10. Mozambique Epidemiological Fact Sheet on HIV/AIDS, 2000 update. UNAIDS
11. An overview of the State of Primary Education in Mozambique. Oxfam, 1999
12. Estatutodo do Professor do Ensino Primário em Mozambique . Estudo Brigitte Bagnol e Zaida Cabral, Maputo Janeiro de 1998
13. Estudo CAP nas Escolas: Conhecimento, Atitudes , Practicas e Comportamento em Saúde

## **Appendix D: List of Abbreviations.**

|         |   |
|---------|---|
| ADPP    | Ajuda de Desenvolvimento de Povo para Povo (Development Aid from People to People)              |
| CAS     | Country Assistance Strategy   |
| CRC     | Convention on the Rights of the Child   |
| CVM     | Crus Vermelho Mozambique (Mozambican Red Cross)   |
| DANIDA  | Danish International Development Agency   |
| ECD     | Early Childhood Development Programs  |
| EP1     | Primary Schools Grades 1 to 5   |
| EP2     | Primary Schools Grades 6 to 7   |
| ESSP    | Education Sector Strategy Program   |
| FINNIDA | Finnish International Development Agency  |
| FRESH   | Focusing Resources on Effective School Health   |
| HIPC    | Highly Indebted Poor Countries  |
| IEC     | Information Education Communication   |
| IMAP    | Instituto de Magisterio Primario (Teacher Training Institute)                                   |
| IMCI    | Integrated Management of Childhood Illnesses  |
| INDE    | Instituto Nacional de Desenvolvimento da Educacao ((Institute for the Development of Education) |
| MINED   | Ministerio de Educacao (Ministry of Education)  |
| MISAU   | Ministerio de Saude (Ministry of Health)  |
| NGP     | Nongovernment Organization  |
| PNI     | Programa Nacional Integrada de Saude da Communidade (Integrated Community Health Program)       |
| RH      | Reproductive Health   |
| SEA     | Saude Escolar e do Adolescente (School and Adolescent Health)                                   |
| SHNP    | School Health and Nutrition Program   |
| SIDA    | Swedish International Development Agency  |
| STD     | Sexual Transmitted Diseases   |
| SWAP    | Sectorwide Approach   |
| UNAIDS  | United Nations for Aids   |
| UNESCO  | United Nations Educational, Scientific and Cultural Organization                                |
| UNFPA   | United Nations Population Fund  |
| UNICEF  | United Nations Children Fund  |
| USAID   | United States Agency for International Development  |
| WB      | World Bank  |
| WFP     | World Food Programme  |
| WHO     | World Health Organization   |
| ZIP     | Zona de Influencia Pedagogica (Pedagogical Support Zones)                                       |

## **Appendix E: Life Skills Programs for HIV/AIDS**

### ***E.1 Why HIV/AIDS Prevention Programs are Urgently Needed:***

Of the estimated 33.6 million people living with HIV/AIDS today, 1.2 million are children under 15 years old, and at least one-third are young people between the ages of 15 and 24—the majority living in Sub-Saharan Africa. The epidemic has left 11.2 million orphans, children whose parents have died as a result of AIDS (UNAIDS/WHO 1999). Sixty percent of new cases of HIV/AIDS are in the 15 to 25 age group (UNAIDS 1997b), girls being disproportionately affected, and for those living in southern Africa they enter a world where average life expectancy is predicted to fall from nearly 60 to 45 or even 30 years by the year 2010 (UNAIDS 1999, in Gachuhi 1999).

Children with HIV/AIDS often suffer prejudice, they become ill, and will die young. Children also suffer through the illness and death of parents and relatives. The drain on family resources means that families may no longer be able to afford school fees, and children are more likely to be removed from school to help care for sick relatives and to supplement family income. A study in Tanzania, for example, suggested that primary school attendance will decrease by 22% and secondary school attendance by 14% due to AIDS-related factors (World Bank 1992, in Gachuhi 1999). The tragedy is that children's chance for education is compromised by HIV/AIDS, as are the schools themselves by loss of teachers and staff. It is, however, the education system that can play a major part in halting and reversing the AIDS epidemic, by providing children with the information and promoting the values, attitudes, and skills that they will need to reduce their risk of falling victim to HIV infection. Children aged 5 to 14 need to be reached at this critical stage in their lives and offered the "window of hope" in stopping the spread of HIV/AIDS:

### ***E.2 Life Skills HIV/AIDS Prevention Programs in Schools***

Schools provide an efficient way of reaching a large proportion of young people at an age when lifelong behaviors are formed. They can offer interventions that help reduce risk of infections (HIV/STDs), by delaying initiation of sex and, when young people become sexually active, avoiding risk behavior. Appropriate Life Skills and sexual education programs can also help to reduce other unwanted situations such as early pregnancy (Kirby et al 1994; UNAIDS 1997a; UNAIDS 1997b; WHO 1999; WHO 2000).

### ***E.3 Information Alone is Not Enough:***

There are now numerous studies showing that providing information about areas such as sex, STDs, and HIV (transmission, risk factors, how to avoid infection) is necessary, but not sufficient to lead to behavioral change. Programs that provide accurate information to counteract the myths and misinformation that often surround HIV/AIDS may lead to an increase in knowledge and a change of attitudes, but this is poorly correlated with behavioral change leading to a decrease in risk taking and desirable behavioral outcomes (Gatawa 1995; UNAIDS 1997a). Hubley (2000) for example,

summarizes 14 HIV/AIDS intervention programs in schools in developing countries. Almost all (13) showed a significant increase in knowledge about HIV/AIDS and avoidance of risk taking behavior following the intervention, but only six demonstrated an intention to increase use of condoms or a reported decline in risk taking behavior (e.g., fewer sexual partners).

#### **E.4 Life Skills Training (LST)**

Life Skills training can help children make informed decisions, recognize and avoid risky situations and behaviors, and give them an opportunity to *practice* these skills. They are more effective than traditional teaching methods in influencing behavior rather than just imparting knowledge. These skills are best acquired through learner-centered, participatory, experiential programs (Kirby et al 1994; UNAIDS 1999). A common feature of successful programs is that they are explicitly or implicitly based on a Social Learning (SL) (or cognitive) model of behavior. Central tenets of SL theory are *self-efficacy*—belief in the ability to implement the necessary behavior, and *outcome expectancies*—beliefs in positive outcomes of the implemented behavior. In the context of HIV/AIDS prevention, this might translate into a belief by the student that they can and will practice less risky behavior, such as condom use, abstaining from sex, or reducing the number of partners, and that these measures will be effective in reducing the risk of HIV infection.

#### **E.5 Characteristics of Successful Programs**

Reviews of school-based HIV/AIDS programs (23 studies in the USA (Kirby *et al.* 1994), 37 other countries (reported in UNAIDS 1999), and 53 studies in USA, Europe, and elsewhere (UNAIDS 1997a)) have identified the following common characteristics of successful programs:

- Focus on a few *specific behavioral goals*, such as delaying initiation of intercourse or using protection
- Use of *Social Learning theories* as a foundation for program development
- Provision of *basic, accurate information* about the risks of unprotected intercourse and methods of avoiding unprotected intercourse, through *experiential activities* (games, role playing, group discussions, etc.) to personalize this information
- Addressing *social or media influences* on sexual behaviors
- Reinforcement of *clear and appropriate values* to strengthen individual values and group norms against unprotected sex
- Modeling and practice in *communication and negotiation skills*

- *Extensive training* for teachers/implementers to allow them to master the basic information about HIV/AIDS and to practice and become confident with life skills training methods
- *Support* for reproductive health and HIV/STD prevention programs by school authorities, decision and policy makers, as well as the wider community
- *Evaluation* (e.g., of outcomes, design, implementation, sustainability, school, student, and community support) so that programs can be improved and successful practices encouraged
- *Age-appropriateness*, targeting students in different age groups and developmental stages with appropriate messages. For example, one goal of targeting younger students, who are not yet sexually active, might be to delay the initiation of intercourse, whereas for older, sexually active students the emphasis might be to reduce the number of sexual partners and use condoms
- *Gender sensitive*, for both boys and girls

#### ***E.6 Challenges***

Reluctance to implement programs that touch on sensitive areas such as sex, sexuality, and contraception may be due to a belief that discussion of such areas will encourage earlier initiation of sex and promiscuity. The majority of evidence suggests that this is not the case, and that well implemented programs, conducted in an atmosphere of free discussion of all the issues, have the reverse effect, with young people delaying the initiation of intercourse and reducing the frequency of intercourse and number of sexual partners (UNAIDS 1997a).

Many of the models for Life Skills/HIV/AIDS programs have been developed in western, developed countries. Their applicability to developing countries that may have different sociocultural norms, values, and religious beliefs needs careful evaluation, so that programs are culturally appropriate (Kirby et al 1994; UNAIDS 1999; Kinsman et al 1999).

As well as targeting adolescents, programs need to be targeted at children at an early age before they become sexually active. Many programs targeted at secondary school students will neglect these younger children—many of whom will already have dropped out of school (Gachuhi 1999; Partnership for Child Development 1998). Conversely, programs targeted at primary school children need to address the diverse age range of children, as evidence from many developing countries indicates that late entry leads to many primary school children already being in their teens (Partnership for Child Development 1998).

Schools need to have strong policies and a healthy environment in terms of behavior of students to each other, teachers, and school personnel. Sexual abuse can occur in schools, with both boys and girls reporting abuse by school staff (Kinsman et al

1999; Lowensen et al 1996). Programs need to address this potential problem by reaching teachers, so that they can become role models rather than neutral or adverse figures in relation to sexual behavior.

Participatory teaching methods are new to many teachers. Sufficient support, training, practice, and time needs to be given to teachers, in both pre- and in-service training sessions and workshops, or the more didactic, traditional teaching methods will still be used (Gatawa 1995; Gachuhi 1999). Teachers also need support in teaching sensitive areas such as sex, sexuality, and condom use to overcome potential embarrassment and reluctance to tackle these areas. Sufficient time must also be given in the curriculum—whether HIV/AIDS is taught as a separate topic or integrated into pre-existing curriculum areas.

### ***E.7 Prevention Works***

In 2000, the world's attention is focused on AIDS. At the recent XIII International AIDS Conference in Durban, July 2000, delegates at the Prevention Works Symposium identified three overriding themes and strategies: preventing mother to child transmission, treating STDs (that increase vulnerability to HIV infection), and life skills training for young people—"...awareness needs to be translated into appropriate behaviors and behavior change messages; and family and supporting social structures need to be involved. But above all, such programs must start early—targeting five and six year olds.... There is good evidence that prevention works. There's no excuse for governments not to invest in prevention."

Nelson Mandela spoke of the devastating effects of AIDS in Africa stressing that HIV is a wholly preventable cause of death. He continued: "I am shocked to learn that 1 in 2, that is half of our young people will die of AIDS. The most frightening thing is that all of these infections which statistics tell us about, WERE PREVENTABLE."

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# **TANZANIA**



# **A Situation Analysis of the Health of School Children and Current School Health and Nutrition Programs in Tanzania**

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**Matthew Jukes**

Department of Infectious Disease Epidemiology  
Imperial College School of Medicine  
Norfolk Place, London W2 1PG, UK

**Damaris Ngorosho**

UKUMTA, Box 9383, Dar es Salaam, Tanzania

Prepared for  
Donald Hamilton, AFTH1  
Don Bundy, HDNED  
Seung-hee Lee, AFTH2



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## **1. Introduction**

The aim of this situation analysis is to describe the current situation of school health in Tanzania and to identify areas where the current program may be strengthened. The emphasis is on identifying cost-effective and sustainable interventions to be included in a school health and nutrition program that may later be expanded to include a broader range of interventions. Emphasis is also given to interventions that have the potential to reach a large number of children, particularly in the poorest communities.

Section 2 describes common health problems facing school age children in Tanzania, the impact these problems may have on the children's education and ways in which these problems may be prevented or treated. Section 3 describes the National School Health Program (NSHP) and current school health and nutrition activities at the district level. Section 4 presents recommendations for the development of the NSHP and Section 5 presents a plan of action for the implementation of these recommendations.

## **2. Health problems and solutions for school-age children in Tanzania**

### ***2.1 To what extent are school-age children affected by health problems in Sub-Saharan Africa?***

School-age children in Sub-Saharan have not traditionally been regarded as a priority group at which to target health interventions. Health initiatives in vulnerable groups such as the under-5s or pregnant women have led to a disproportionate under-resourcing of initiatives to tackle health problems of school age children. School age children are estimated to bear 13.7% of the burden of disease in Sub-Saharan Africa (Murray and Lopez, 1996). It is clear that they receive less than 13.7% of health sector resources, even in a country such as Tanzania which has a long history of school health programs.

What are the main health problems for children in Sub-Saharan Africa? The following table details the leading causes of death and disability (measured in Disability-Adjusted Life Years – DALYs - lost) for school-aged children in Sub-Saharan Africa. This table will be used to guide the analysis in subsequent sections of this document.

---

#### **BURDEN OF DISEASE BY DALYs**

Sub-Saharan Africa – School Aged Children (Aged 5-14) for 1990

| Leading Causes of Lost DALYs   | Annual DALYs Lost | % of Burden | Percentile |
|--------------------------------|-------------------|-------------|------------|
| <b>1<sup>st</sup> Quartile</b> |                   |             |            |
| 1. Injuries – Unintentional    | 9,721,992         | 26.0%       | 26.0%      |
| <b>2<sup>nd</sup> Quartile</b> |                   |             |            |
| 2. Measles                     | 3,224,216         | 8.6%        | 34.6%      |

|  |           |      |       |
|--|-----------|------|-------|
| 3. Pneumonia (ALRI)                                    | 3,098,405 | 8.3% | 42.9% |
| 4. Diarrhoeal Diseases                                 | 2,888,281 | 7.7% | 50.6% |
| <b>3<sup>rd</sup> Quartile</b>                         |           |      |       |
| 5. Malaria   | 2,326,960 | 6.2% | 56.8% |
| 6. Cardiovascular Disease                              | 1,806,012 | 4.8% | 62.6% |
| 7. Malnutrition (excluding micronutrient deficiencies) | 1,487,645 | 4.0% | 65.6% |
| 8. War   | 1,215,413 | 3.2% | 68.9% |
| 9. Tuberculosis  | 1,099,610 | 2.9% | 71.8% |
| 10. Neuro-psychiatric                                  | 762,774   | 2.0% | 73.8% |
| 11. Anaemia  | 759,543   | 2.0% | 75.9% |
| <b>4<sup>th</sup> Quartile</b>                         |           |      |       |
| 12. Other Digestive                                    | 711,585   | 1.9% | 77.8% |
| 13. Nephritis/Nephrosis                                | 633,309   | 1.7% | 79.5% |
| 14. Other Infections                                   | 620,036   | 1.7% | 81.1% |
| 15. Petruissis   | 595,011   | 1.6% | 82.7% |
| 16. Trypanosomiasis                                    | 530,705   | 1.4% | 84.1% |
| 17. Homicide and Violence                              | 471,194   | 1.3% | 85.4% |
| 18. Other Respiratory                                  | 460,940   | 1.2% | 86.6% |
| 19. Schistosomiasis                                    | 457,103   | 1.2% | 87.8% |
| 20. Asthma   | 452,094   | 1.2% | 89.1% |
| 21. Lymphatic Filariasis                               | 433,472   | 1.2% | 90.2% |
| 22. Vitamin A Deficiency                               | 422,497   | 1.1% | 91.3% |
| 23. Maternal Conditions                                | 391,332   | 1.0% | 92.4% |
| 24. Tetanus  | 353,354   | 0.9% | 93.3% |
| 25. HIV*   | 342,846   | 0.9% | 94.3% |
| 26. Appendicitis                                       | 254,629   | 0.7% | 94.9% |
| 27. Leishmaniasis                                      | 249,457   | 0.7% | 95.6% |
| 28. Intestinal Nematodes                               | 239,636   | 0.6% | 96.2% |
| 29. Congenital Abnormalities                           | 228,389   | 0.6% | 96.8% |
| 30. Otitis Media                                       | 154,945   | 0.4% | 97.3% |
| 31. Onchoceriasis                                      | 152,327   | 0.4% | 97.7% |
| 32. Other Genito-Urinary                               | 106,533   | 0.3% | 98.0% |

\* Burden of disease of HIV infection in school aged children rises to 2.0% when future infection in adults is considered      From data compiled by Murray and Lopez, 1996

## 2.2 What are the main health problems for children in Tanzania?

An analysis of the comparative impact of different causes on the health of school-age children, such as that presented in Section 2.1 for Sub-Saharan Africa, has not been conducted specifically for Tanzania. However, the NSHP began a baseline survey of health problems in the school age child in 1999 and most results have been collected and are awaiting entry into a database. This survey was carried out in all schools and coordinated by the School Health Coordinator in each district and so should provide valuable information to inform the design of school health and nutrition programs. In the

absence of such a detailed survey the health problems presented in the rest of this section have been selected using the following criteria

1. Data show that the problem is one that afflicts school-age children in Tanzania or similar neighbouring countries OR one that is considered to be important by the Government or other stakeholders in Tanzania.
2. The health condition should be one that affects the educational achievement of children.
3. There should be a potential role for a school health and nutrition program to play in addressing the health problem.

These criteria are not intended to be overly selective. Rather, a wide range of health problems are included in the following analysis which may be used to select the most appropriate interventions to be included in a school health and nutrition program in Tanzania.

Each of the following subsections addresses one health problem in the following framework. First, the problem is described. Second, the effect the health problem has on children's education is detailed, where evidence is available. Third, we examine potential remedies for these health problems. Finally, we explore the potential for such remedies to be operationalised in a Tanzanian School health and nutrition program.

### ***2.3 Parasitic Infectious Disease***

#### ***2.3.1 Malaria***

Malaria infection is one of the leading causes of morbidity in Tanzania, accounting for 20% of all hospital admissions and 3% of all hospital deaths (Kilama and Kihamia 1991). A number of studies with primary school children in Tanzania have found infection rates of between 50% and 80% (Irare et al, 1988, Partnership for Child Development, unpublished data).

Malaria is estimated to cause between 2% and 8% of all school absenteeism. School performance is also affected by the disease for those children who do attend.

A range of strategies is available for school-based control of malaria:

- 1) Continuous chemoprophylaxis
- 2) Mass treatment
- 3) Screening for parasites and selective treatment of infections
- 4) Selective treatment of fevers

However, none of these approaches have proved successful due either to the high cost and un-sustainability of the intervention, or to increased parasite resistance to the drug (see e.g. Lemnge et al., 1997, working in Tanzania). A recent review of school-based

control methods in Kenya (Brooker et al, 2000) concluded that “the management of treatment by and in schools appears either an unaffordable or an unattractive option.”

However, the school does have a major role to play in malaria prevention. Both through skills-based health education, and through promotion of a safe school environment, free from pools of stagnant water, school health and nutrition programs can contribute to a significant reduction in malaria transmission.

### *2.3.2 Intestinal Nematodes*

These include ascariasis, trichuriasis and hookworm. Among these, hookworm is particularly prevalent throughout Tanzania, with infection rates in excess of 50% in many areas. Studies show that worm loads are highest throughout the school-age years, so treatment of this disease should be a priority of school health and nutrition programs.

Hookworm results in blood loss that leads to iron deficiency anaemia. In addition, infection with intestinal nematodes has been shown to impair school achievement and reduce school attendance.

Infection with intestinal nematodes can be treated with a twice annual dose of albendazole or mebendazole. This can be given as a mass treatment to all children. Estimated cost of drug delivery, when administered by teachers and distributed using the existing education infrastructure, is \$0.04 per child treated (Partnership for Child Development, 1998).

In addition to drug treatment, health education has a large role to play in the prevention of infection with intestinal parasites. Encouraging children to defecate only in latrines (which of course must be provided in all schools), washing hands before and after eating, washing fruit before eating it and wearing shoes at all times all help to reduce the likelihood of contracting intestinal nematode infection.

### *2.3.3 Schistosomiasis*

Urinary schistosomiasis is a widespread problem in Tanzania, particularly in the coastal and lake regions where prevalences of over 70% have been reported (UKUMTA, 1996). Intestinal schistosomiasis is less common, with pockets of infection occurring mainly around Lake Victoria.

Both forms of infection can impair mental development (Partnership for Child Development, in press), haemoglobin levels and growth (Partnership for Child Development, 1998).

Both infections can be treated satisfactorily with a single annual dose of praziquantel. Due to potential side effects, WHO recommend mass treatment only for schools with prevalence of over 50%. This has the potential to increase costs significantly. However, the UKUMTA project in Tanga Region has developed a low cost method of determining

infection status by administering a questionnaire to children. This questionnaire has proved successful for determining infection status (Ansell et al., 1997).

Cost of drug delivery has been further reduced by the development of a height pole (Partnership for Child Development, 1998) to estimate dose size. The recommended dose is 40mg per kg of bodyweight. Maintenance and use of weighing scales can be time consuming and expensive. However, the process can be simplified by using height as a proxy for weight. Locally-made poles can be used to estimate dose. This method has been shown to be both safe and cost-effective.

Using the above method of drug delivery by trained teachers in Tanga, a significant increase in height (1.5cm over 16months) and haemoglobin levels (4.8g/l) was observed in treated children.

The estimated delivery cost of this method of treatment was \$0.21 per child treated. This compares with an estimated \$0.76 per child when treatment is delivered without using the existing education structures (i.e. delivering treatment outside of a school health and nutrition program).

A great opportunity exists for this aspect of a SHNP to collaborate with the Schistosomiasis Control Initiative (SCI) which has recently received funding from the Gates Foundation for the control of schistosomiasis in Tanzania, among other countries. SCI has expressed interest in working with a SHNP to achieve common goals.

In addition to treatment with praziquantel, teaching children not to swim in slow moving or stagnant water, and to urinate and defecate only in latrines can help stem the spread of schistosomiasis.

## ***2.4 Nutritional Deficiencies***

### ***2.4.1 Protein energy under nutrition (PEU)***

This is a widespread problem in Tanzania. A national survey (Nutrition of Infants and Young Children in Tanzania, 1992, in Janke et al, 1995) reveals that 57% of five year olds are stunted (height-for-age z score < -2), representing chronic under nutrition, with 25% underweight (weight-for-height z score < -2). Regional studies in Kisarawe District (Janke et al, 1995) and Tanga Region (Partnership for Child Development, 1998) show that this problem gets worse throughout the school-age years. In Kisarawe, the proportion of children who were undernourished rose from 18% at age 5 to 46% at age 18, although the study in Tanga indicates that this trend is gender specific, with the nutritional status of boys deteriorating throughout the teenage years whilst girls' nutritional status shows signs of recovery towards the late teens.

PEU impairs mental development and educational achievement (Grantham-McGregor, 2000) and is associated with late enrolment and school dropout.

Given the increase in stunting throughout the school-age years, school health and nutrition programs provide a timely opportunity for intervention to stem this increase. A number of methods have been tried.

It is possible that school gardens can be cultivated to supplement children's diet. However, these efforts have often been perceived as means to exploit children's labour for financial gain (TADREG, 1993).

School feeding programs have the potential to alleviate under nutrition. However, the cost of these programs has often proved prohibitive. For example, the current school feeding program in Dodoma, Singida and Arusha regions, sponsored by the World Food Program, costs approximately \$18 per child per year in food alone. When delivery costs are included, this figure may increase by a factor of two or three. In addition to the direct costs, there are often high opportunity costs to the education sector, including time required to prepare food, and utensils and shelter for food preparation.

School feeding programs run by the education sector, as a means of alleviating under nutrition, do not compare favourably with the cost-effective alternative of micronutrient supplementation. Annual supplementation of Vitamin A and iron costs approximately \$1 per child per year and can produce substantial gains in height and weight. Another disadvantage of school feeding programs is that there is a risk of the food provided substituting for rather than supplementing food given to the child at home. School feeding programs are effective in increasing attendance but this advantage must be assessed against the potential for equivalent cash benefits to increase school attendance. Given the disadvantages listed, a possible alternative is for school feeding programs to be community-based, where the program is neither paid for nor managed by the education sector.

#### *2.4.2 Short term hunger*

The World Bank estimates that 45% of primary school students do not receive any food before going to school and 89% do not receive any food whilst at school.

Short term hunger has been shown to significantly affect mental performance (Simeon and Grantham-McGregor, 1990) and may be responsible for discouraging children from attending school.

A number of factors are responsible for short term hunger.

- Long distance from home to school so that children begin their journey to school before breakfast is prepared, and are unable to go home to eat if there is a break in the school day.
- Chronic scarcity of food
- Seasonal scarcity of food
- Children receiving disproportionately small amounts of family food resources

The only realistic method of alleviating short term hunger is by the introduction of feeding programs for children. Indeed, Janke et al. (1995), in a report commissioned by the Tanzanian Food and Nutrition Centre, recommend that the alleviation of short-term hunger should be the principal aim of feeding programs for school children. However, as discussed in the previous section, there are many disadvantages to introducing school-based feeding programs. The best solution to combat short-term hunger may lie in the introduction of feeding programs, but such initiatives should be community based to ensure sustainability and the reduction of costs to the education sector.

#### *2.4.3 Iron deficiency anaemia*

This is a widespread problem in Tanzania. A recent paper (Partnership for Child Development, 2000) found that the prevalence of anaemia (haemoglobin < 130g/dL) in school children in Tanga Region (58% for 7-11 yrs, and 72% for 12-14 yrs) and in Mwanza Region (56% for 7-11 yrs, and 75% for 12-14 yrs) was among the highest in the eight low-income countries surveyed. These two studies were conducted in Coastal Tanzania and in the Lake Region, respectively. Both of these areas have a high prevalence of helminth infections and of malaria. Where these parasitic diseases are less common, iron deficiency anaemia is only slightly less of a problem. A study in Arusha Region found an iron deficiency anaemia prevalence of 51% for 6-14 year olds.

Amongst the literature on health and educational achievement, iron deficiency anaemia has the greatest and most clear-cut impact on cognitive function and school achievement (Grantham-McGregor and Ali, 2000; Pollitt, 1990). It is also a potential mediator for the effect of parasitic diseases such as hookworm and malaria on mental development.

There are a number of causes of iron deficiency anaemia. Data from WHO Global Database on Anaemia and Iron Deficiency shows that, in Sub-Saharan Africa, the leading causes of Iron Deficiency Anaemia are:

- 1 Diet
- 2 Hookworm
- 3 Schistosomiasis
- 4 Malaria
- 5 Sickle cell
- 6 Vitamin A deficiency

Iron deficiency anaemia can be alleviated either by combating its root causes, or by direct supplementation with iron. Work in Tanzania shows that haemoglobin levels of school children can be significantly improved by weekly doses of ferrous sulphate (Tatala et al., 1998). The recommended annual treatment regimen is 10 consecutive weekly doses of iron supplementation.

Treating children for intestinal parasites and for schistosomiasis can significantly improve haemoglobin concentration (Beasley et al., 1999). Vitamin A supplements can produce a mean improvement of around 13 g/L over a 3-month time period (Mwanri et

al., 2000). Treatment for malaria has also been shown to improve haemoglobin concentration. Finally, educating children about the selection of nutritious foods has the potential to improve iron stores.

#### *2.4.4 Vitamin A deficiency*

Vitamin A deficiency is estimated to affect 6% of the total population of Tanzania. Similar figures are not available specifically for school-age children, although a TFNC study in Rukwa region (Kavishe et al, 1991) found that 0.3% of children had a recent history of night blindness, and 1.1% had conjunctival xerosis, both symptoms of acute vitamin A deficiency.

Recent evidence (Mwanri, in prep) suggest that supplementation with Vitamin A can improve educational performance.

The same study (Mwanri et al, 2000) found that a 3-month period of Vitamin A supplementation resulted in an increase of 10 g/dl in improvement in haemoglobin concentration, and an increase of 0.3 cm in height.

Alternatives to direct supplementation include encouraging children to eat fruit and vegetables, and to include red palm oil in their diet.

#### *2.4.5 Iodine Deficiency*

In 1988 an estimated that 40% of Tanzanian lived in iodine deficient areas, of whom 50% suffered from endemic goitre, 1.6% were cretins, and 4.5% were cretinoids.

There is evidence that iodine deficiency impairs mental performance (Pollitt, 1990).

Iodine deficiency (IDD) is caused by lack of iodine in the diet. It is particularly prevalent in highland areas where heavy rain washes iodine from the soil, and in lowland areas prone to flooding.

The government has had two campaigns to eliminate iodine deficiency in the last two decades. Distribution of iodised oil capsules in schools and other centres began in 1986. In one study, the incidence of goitre in three schools in Morogoro region was reduced from 75% to 52% three years later as a result of this initiative. In 1991 a campaign to iodise salt began, and it is now illegal to sell salt that has not been iodised for human consumption. It was estimated that by 1995, 90% of all commercially-available salt contained iodine.

It is not clear how successful these government initiatives have been in reducing iodine deficiency. Where they have not been successful, it is possible for school health and nutrition programs to intervene. A single annual dose of iodine oil capsules, administered by a teacher, is sufficient to reduce iodine deficiency.

## **2.5 Reproductive Health**

Reproductive Health is an increasing important issue for primary school children. According to the 1999 Tanzanian Demographic and Health Survey 10% of boys and 12% of girls have had sexual intercourse by the age of 15. By the age of 19 these figures rise to 41% and 46% respectively. Many of these children are still attending primary school.

### **2.5.1 HIV/AIDS**

Although relatively few school-age children in Tanzania are infected with HIV, the number rises dramatically in the late adolescence, with 6.1% of all 15-24 year olds (8.1% of women in this age group) living with HIV/AIDS (TDHS, 1999).

The school-age years are an ideal time to influence children's attitudes and knowledge of HIV/ AIDS. Presently, only 58% of girls in school can say correctly that a healthy-looking person can be infected with HIV. This figure falls to 35% for those out of school. Only 52% of girls in rural areas are able to name a principal method of avoiding catching the HIV virus. The main sources of information about AIDS for school-age children are friends and relatives and the radio.

Health education has the potential to reduce greatly adolescents' chances of becoming infected with HIV, particularly if a skills-based approach is taken. This involves teaching children more than just information, and providing them with skills and strategies for refusing sex, for example.

HIV/AIDS also impacts on the education sector through mortality of parents and teachers. This affects school health and nutrition programs in that enrolment rates are reduced for orphaned children (54% in comparison with 72% for children with two living parents. TDHS, 1999). Financial assistance targeted at orphans has had some success in improving enrolment. The government has pledged to offer free education to all AIDS orphans, although it is not clear how far this has been implemented to date.

### **2.5.2 Pregnancy and Abortion**

The incidence of pregnancy in school-age girls is high. By age 19, 61% of girls are pregnant with their first child, or are already mothers (TDHS).

Pregnancy is a leading cause of school drop out in this age group. An initiative in non-formal education known as Complementary Basic Education and Training (COBET) lists pregnant girls or young mothers as one of the targets of their non-formal education centres because these girls are either excluded from school or else do not feel able to return to school.

Abortion is also a problem in this age group. A study in Dar es Salaam (Mpangile et al., 1992) found that 47% of women admitted to hospital with abortion complications admitted to having induced abortion. A third of these women were teenagers.

The most effective response of a school health program to these issues is through health education. Many children, for example, believe that milk and rice water, when taken after intercourse, can prevent pregnancy (Leshabari & Kaaya, 1996). Many believe soap powder and high doses of antimalarials can induce abortion (Fundikira, 1985). School health and nutrition programs have the potential to give children accurate information about these issues and also to teach them valuable skills to avoid and to deal with pregnancy.

Such efforts should be accompanied by changes in policy and in the communication of these policies to allow pregnant girls and young mothers to attend school.

## **2.6 Injury**

Data presented at the beginning of this section lists injuries as representing the leading disease burden in school-age children in Sub-Saharan Africa. Across the continent, motor vehicle accidents are the leading cause of injury (19.2% of all injuries), followed by drowning (15.27%) and fires (13.8%).

There are three approaches a SHNP can take to prevent and treat injuries.

1. Promotion of a safe school environment, minimising the potential for injuries within the school compound, and when leaving the school compound (for example, onto a nearby road).
2. Skills-based health education to teach children strategies for minimising risk-taking behaviours in addition to traditional knowledge-based teaching.
3. Provision of first aid equipment in schools. At present, only 5% of schools are estimated to have functional first aid kits on site.

Of these three possibilities, the first two are most likely to be effective. First aid kits are often associated with problems of financing and sustainability.

## **2.7 Mental Health**

Only 10 new cases of psychiatric disorders are seen at Muhimbili Medical Centre Psychiatric Clinic each month (Leshabari et al., 1995). This indicates an extreme underreporting and lack of diagnosis of psychiatric problems in the population at large, and presumably also in school-age children. Very little is known about the state of childhood psychological disorders in Tanzania such as Attention Deficit Hyperactivity Disorder (ADHD), autism, and specific language impairments (SLI). These disorders are not fully understood and there is no effective response to them in much of sub-Saharan Africa. In the absence of further information on mental health in Africa and Tanzania in

particular, it is not clear what role a School Health and Nutrition in Tanzania has to play in tackling these problems.

### ***2.8 Diarrhoeal Diseases***

These represent the fourth highest burden of disease for school-age children. Diarrhoeal diseases can also impair mental development, especially in very young children (Guerrant, 2000).

SHNPs can help prevent diarrhoeal disease by the provision of safe, clean drinking water and by educating children on the dangers of drinking unclean water.

### ***2.9 Skin conditions***

Skin conditions such as scabies, fungal and bacterial infections and jigger fleas are reasonably common in Tanzania school children. In a study in Bagamoyo, 30% of children were found to have a skin condition.

Skin conditions are best combated by improving sanitation in schools and by educating children to improve personal hygiene.

### ***2.10 Drug and alcohol abuse***

A study in Rombo revealed that 31.5% of school children (primary and secondary) had ever used alcohol (Leshabari and Kaaya, 1996). 24% of adolescents in Dar es Salaam report using alcohol on a regular basis (Kaaya et al., 1992). Less is known about the use of illegal drugs such as cannabis, heroin and cocaine, although all of these are known to be available in Dar es Salaam.

It appears that, as yet, smoking is not widespread in school-age children. However, with cigarette advertising on the increase, and with anecdotal evidence of some cigarette companies giving away free cigarettes to children in Tanzania in promotional exercises, it would be timely for a school health and nutrition program to address tobacco use in school children before it becomes a serious problem.

The main method of combating these problems is, again, through skills-based health education to change children's behaviour with respect to tobacco use in addition to educating them as to the health risks of using tobacco. Education policies, such as banning teachers from smoking in front of school children, can also have an impact on these problems.

### ***2.11 Sexual abuse and harassment***

Sexual abuse is listed as one of the most common reason for African girls to drop out of school.

Sexual abuse is illegal in Tanzania. However, such behaviour can only be combated by ensuring that policies against sexual abuse and harassment are clear and transparent. The government should make clear the consequences of breaking such laws and should introduce effective communication strategies to ensure that all teachers, parents and students are aware of the policy and its consequences.

### **3. Current school health activities in Tanzania**

#### ***3.1 The National School Health Program***

Over the last two years, the National School Health Programme (NSHP) has been developed with financial support from Irish Aid. Activities of the NSHP within the Ministry of Health have been expanded and a new office has been set up in Muhimbi Medical Centre, with three staff under the Directorship of Dr. Ursuline Nyandindi. The aim of the programme has been to develop structures and guidelines for the national coordination of district school health programs. Achievement so far include:

1) A National School Health Policy, to which the Permanent Secretaries of the Ministry of Education and Culture and the Ministry of Health are both signatories. This policy has three central components

- a) Health Education
- b) A healthy school environment
- c) School health services

2) District School Health Coordinators have been introduced to District Education Offices and, together with the existing District School Health Coordinators in District Medical Offices, attended a 3-day training workshop in 1999.

During the year 2000, resources were available for update workshops for only the Regional District School Health Coordinators.

3) A clarification of the organisation structure of the School Health Program within the Ministries of Health and of Education and Culture, and at regional and district level.

4) The establishment of a steering committee which guides the activities of the School Health Program and a technical sub-committee which gives to technical support to the planning of school health and nutrition programs.

5) A national survey of the health of school-age children has been conducted. Results are currently being compiled.

Despite the successful implementation of structure and guidelines at the national level, this is yet to translate into school health activities taking place at the level of the school, although few, if any, reports have been submitted to the National School Health Program

office so it is difficult to ascertain the level of current activity. There is a clear need for improved monitoring of district school health plans.

The manager of the NSHP identified three areas that should be improved to facilitate the implementation of SHNPs in schools.

- 1) Advocacy to convince district officers, particularly the District Executive Officers (DEDs) of the importance of school health and nutrition programs. Although lack of resources may ultimately restrict the implementation of SHNPs this is not the major obstacle at present. Districts have not yet reached the stage of requesting funds for SHNPs by including them in their district plans.
- 2) Practical guidelines are lacking to advise district coordinators on how to develop SHNP plans.
- 3) Transport is lacking for District School Health Coordinators to implement and monitor SH activities in their district.

### ***3.2 District-level school health programs***

The current situation analysis did not include a comprehensive review of existing school health activities at the district level. However a number of projects were discussed with stakeholders during this analysis and the following offered the potential to act as models for aspects of a district SHNP.

#### ***3.2.1 Skills-based health education in HIV/AIDS and sexual reproductive health***

- 1) A GTZ-sponsored project in Mbeya region has recently finished a successful pilot period and the project plans now to scale up to include more districts in the area. The project, which takes a skills-based approach to health education, has focussed on peer education methods as well as on health education by teachers.
- 2) A project run through Mema kwa Vijana in Mwanza district has been running for over a year and has recently produced its first report. This project has also taken a skills-based approach to sexual reproductive health education, and has involved peer educators. A scientific study of intervention and comparison districts is underway to evaluate the impact of health education on health indicators such as the incidence of sexually transmitted disease.

#### ***3.2.2 Helminth Control***

- 1) The UKUMTA (Ushirikiano wa Kumwendeleza Mtoto Tanzania) project in Tanga has provided an excellent model for the delivery of school-based health services. This is discussed in more detail in Section 2.3.

2) A schistosomiasis control program has also been implemented in Kilosa District, funded by Irish Aid. This program involves the initial screening of children using microscopy techniques.

3) The Schistosomiasis Control Initiative, funded by the Gates Foundation, has expressed an interest in working in Tanzania. This initiative is a timely one and could combine well with a initiative on school-based health services in Tanzania.

### *3.2.3 Nutrition Project*

1) A school feeding program has been implemented with World Food Program Funding in Singida, Arusha and Dodoma Districts. A preliminary report is available for this project but no evaluation has yet been conducted. Findings from this evaluation will be very important in informing the decision of whether to include school feeding programs in a national SHNP.

2) The Tanzanian Food and Nutrition Centre have also undertaken a Health And Nutrition in Primary School Children Project.

### *3.2.4 Water and Sanitation*

1) The HESEWA project (Health through Water and Sanitation) has had considerable success in improving the Health and Sanitation in schools in a number of districts in the country

2) A number of school building projects have also helped to improve sanitation in schools, largely through the construction of latrines.

## **4. Recommendations**

### ***4.1 Institutional***

The Ministries of Health and of Education and Culture have engaged fully in the production of policy guidelines for the National School Health Program. However, implementation and financing of this program has been primarily through the Ministry of Health. School health interventions necessary take place at the school, using education sector resources and personnel. Thus, if the NSHP is to be successful it is imperative that the Ministry of Education and Culture takes the lead in the implementation of school health initiatives, and that the roles of both ministries are clearly defined.

### ***4.2 Policy***

The NSHP has made great progress over the last two years in setting out its vision for school health in the document ‘Policy Guidelines on School Health Promotion in Tanzania Mainland.’ The opportunity now exists to build on these guidelines and to develop policies on the specific details of how school health interventions may be

operationalised. This should include details of how responsibility and financing of the SHNP is shared between MoH and MoEC and of the roles that teachers, schools, teacher training colleges, and District and Regional Education Offices play in the delivery of school health services.

In addition, two actions may be considered:

1) The range of policies should be expanded to address a number of specific practices in schools that jeopardise the health and well-being of school children. These include:

- a) Sexual abuse of children in schools. At present the Child Development Policy (1996) states that one of the seven objectives of the policy and Ministry is “to ensure that there are laws which can be used to deal with child abuse.” It is not clear whether such a law has been introduced in Tanzania.
- b) Pregnancy in school children. The Policy on Women in Development (1992) identified two “issues to address and encourage females’ participation in school and development” one of which involved “amending laws and procedures which govern the system of education and training with the aim of enabling women and girls to attend courses especially in the fields of science and technology, even if they are pregnant.” Again it is not clear whether such a policy has been implemented.
- c) Tobacco use in schools. Teachers should be discouraged from using tobacco on school premises.

2) It is important that all these policy initiatives include clear enforceable measures for those who contravene regulations and methods of communication are established such that all parties involved – parents, teachers, the community and the children themselves – are aware of the policies and the consequences of failing to abide by regulations. Action should be taken to develop an effective communication strategy ensuring transparency.

#### ***4.3 School environment***

A priority for all schools should be the inclusion of at least three latrines (for boys, girls and teachers) with covers and functioning doors. Lack of adequate latrines is a major cause of school absenteeism, particularly for adolescent girls, and can result in the school acting as a centre for disease transmission. Options should be explored for incorporating the building of latrines into school building programs.

The second priority for schools should be the provision of clean water. Where this is deemed too expensive, imaginative alternatives can be sought, such as requiring children to bring small amount of water from home to wash their hands and faces (KEHEP 2000).

In addition to the provision of such facilities, schools should also promote clean and safe environments through health education and daily activities, including cleaning the school surroundings. The creation of a safe and healthy school environment is essential, not only

for the contribution it makes towards improving children's health, but also in order to support other school health activities. It is impossible to teach health-promoting behaviour in an unhealthy environment.

#### ***4.4 Skills-based health education***

Skills-based health education provides one of the most efficient and cost-effective ways to combat many health problems in school age children. For most health problems prevention is better than cure, but for others, such as HIV/AIDS, prevention represents the only viable way for children to avoid the problems of the disease.

Schools provide an effective way of reaching a large proportion of young people at an age when lifelong behaviours are formed. A study from Cameroon 1997 show cost figures per student taught in the range of US\$ 1.17-6.51 (1992-1996 US\$) A Kenyan case study (March, 1999) using children's theatre and radio for skills-based (behaviour focused) education cite the cost of reaching one adolescent as US \$0.03, and US \$0.12 per adolescent who reported behaviour changes.

Skills-based health education requires a departure from traditional information-based health education and as such requires training teachers in the new teaching methodology as well as in the subject matter of the health education lessons. A number of models exist for how the training of new teachers and the retraining of existing teachers may proceed. First, a successful method used in other Sub-Saharan African countries which have recently initiated school health programs (Guinea Conakry, Senegal) is to train a team of Master trainers and with them to develop the skills-based health education curriculum and lesson plans. Members of this team then proceed to all districts in the country to train all in-service teachers. Second, sexual reproductive health education projects are ongoing in both Mbeya and Mwanza Regions as described in Section 3.2. Third, the HIV/AIDS team in the MoEC have been developing a new approach to the education of sexual reproductive health.

It is recommended that ongoing skills-based health education projects in Tanzania are critically evaluated in order to inform the design of a national program of skills-based health education. To maximise the benefits to be gained from the experience of others, the NSHP should seek the technical advice on this matter both from those working on this issue in Tanzania and from those with experience of similar programs in other Sub-Saharan African countries.

Given that HIV/AIDS is a priority of the Government and that most experience of life-skills health education in Tanzania has been in the area of HIV/AIDS in particular and reproductive health in general, it is further recommended that the a skills-based health education program begins with the teaching of reproductive health and HIV/AIDS only, with a view to expanding the range of subjects covered once the program has been shown to be successful.

## **4.5 School-based health services**

### *4.5.1 Method of delivery of health services*

A number of models exists within Tanzania for the delivery of health services. There fall broadly into two categories. Those that are school-based and those that are not.

Those that are not school based involve forging a link between local health services, such as the local hospital, clinic or dispensary and the local school. Children are either referred to the local health services by a mobile health worker or team of workers, or else are treated in school by mobile health teams.

Such a school-based screening program and referral service, if it is well-managed and comprehensive, can be highly cost-effective means of accessing large numbers of children and improving their health, in middle-income countries. However, the resources needed to implement and sustain these services are lacking in low-income countries. Transportation costs and inadequate staffing levels threaten poor screening coverage. Where this happens, it is the poorer and more vulnerable children in inaccessible rural areas who suffer the most. There is no evidence from any such screening and referral projects in Sub-Saharan Africa that this is a cost-effective way to reach the poorest children.

A more successful approach was pioneered by the UKUMTA project in Tanga region (see Section 2.3). This project used the existing Education structures to deliver treatment to over 100,000 children. Teachers were trained to give simple treatments. This method was able to deliver treatment to all communities (not just those near urban centres) at a very low cost. The most straightforward treatment (albendazole for intestinal helminths) was delivered at \$0.04 per child treated. This method of health service delivery is strongly recommended as a model for incorporation into a school health program.

### *4.5.2 Interventions to be delivered*

The key to successful school-based health services, as outlined above, is to select simple and effective interventions that have a significant impact on the health and education of the children involved and yet do not significantly increase the work burden of the teachers involved. Of those discussed in Section 2 the following interventions fit these criteria.

- 1) *Anthelmintics.* One dose of albendazole (400mg) or mebendazole (500mg), given twice yearly according to WHO guidelines, can be used to treat for intestinal nematodes.
- 2) *Praziquantel.* One dose (40mg/kg bodyweight) given annually to treat for urinary schistosomiasis. Dose can be calculated simply using locally made height poles. Questionnaires have been developed in Tanzania as a highly cost-effective way of identifying areas with a high prevalence of schistosomiasis.

- 3) *Iron supplements*. A tablet of ferrous sulphate, administered weekly for ten weeks every year is effective in improving haemoglobin concentration and reducing iron deficiency anaemia.
- 4) *Retinol palmitate supplements* (200 000 IU) given annually to reduce Vitamin A deficiency.
- 5) *Iodised oil capsules\**. A single dose (200 mg) given annually to reduce Iodine deficiency.

\*Much work has been done in recent years to combat iodine deficiency in Tanzania. The inclusion of this part of the intervention package should be discussed after analysis of the effectiveness of recent campaigns in reducing iodine deficiency, through iodised salt.

#### *4.5.3 Other interventions*

*1)* A school-feeding program is a key intervention that has been excluded from the above package of interventions but which has been identified by many stakeholders in the Government and in other agencies as being highly desirable. As discussed in Section 2, these programs have the advantage of alleviating short-term hunger, increasing school attendance, and if appropriate food is provided can reduce nutritional deficiencies. However, programs tend to be expensive and are difficult to sustain. The opportunity cost to the school also tends to be high, with food taking much time to prepare and the process involving the provision of cooking materials and a sheltered area for preparation.

It is recommended that a careful analysis of the costs of such programs, in particular in comparison to the de-worming and micronutrient interventions outlined above. If the government wishes to implement such programs they should not be part of the range of health services provided by teachers. An alternative mechanism, ideally involving the community, should be sought for the delivery of a school-feeding program. In addition it is recommended that much attention is paid to the quality of the food being delivered, in particular including foods fortified with vitamins (e.g. through the addition of palm oil).

*2)* First aid kits provide the potential to improve children's performance in school. Drugs such as anti-malarials, analgesics and equipment to deal with injuries can help treat a child that would otherwise have to attend a clinic or return home. However, first aid kits bring with them a number of problems. There is a danger that drugs can be used for inappropriate purposes, such as treating teachers or other adults in the community. Financing of first aid kits can also be a problem, and many initiatives to introduce them to schools have failed to find a strategy to make their upkeep sustainable. Current methods of using first aid kits in schools are not recommended, but school health workers are encouraged to explore sustainable ways for these to be kept and replenished in schools.

## **5. Plan of Action**

The basic structure for the SHNP will build on the existing framework of a National School Health Program providing support guidance and resources for the planning and implementation of SHNPs by District School Health Coordinators (DSHC).

The plan of action for further development of school health in Tanzania will consist of three phases.

1. The development of national structures and resources for use by district school health teams. This includes clearly defining roles of Ministries in the implementation of the National School Health Program.
2. The implementation of a SHNP in pilot districts.
3. Mainstreaming and rolling out of SHNP.

These will now be discussed in turn.

### ***5.1 The development of national structures and resources (first year)***

The resources coordinated by the National School Health Program will include:

1. Guidelines for District School Health Coordinators on the development of a district school health and nutrition plan.
2. A team to train teachers or other school health workers in teaching skills-based health education
3. A team to train teachers or other school health workers in delivering school-based health services
4. Purchase and storage of drugs and other consumables
5. A team of technical advisors, particularly with regard to Monitoring and Evaluation of SHNP

Activities required to develop these resources:

- 1) The first step in the development of the NSHP should be a retreat workshop for all key personnel at National level, especially within the Ministries of Health and of Education and Culture. The aim of this workshop will be to define roles for both Ministries in the financing and implementation of the NSHP. In particular, it is important that the Ministry of Education and Culture takes a lead in the implementation of the SHNP since use of education sector structures and personnel is critical to the success of this program. The outcome of this workshop will be a memorandum of understanding between Ministry of Health and Ministry of Education and Culture as to their roles in the implementation of the school health and nutrition program.
- 2) A workshop should be held for all key personnel in the NSHP, especially the steering committee and the technical sub-committee of the NSHP, to discuss which elements should be included in school health and nutrition programs and how the programs should be implemented. The outcome of this workshop will be a strategic plan for the

- implementation of the school health and nutrition program. The workshops in 1) and 2) could potentially be combined.
- 3) A finalised plan for school health and nutrition programs should be ratified by Ministries of Health and of Education and Culture.
  - 4) A situation analysis of district school health activities should be conducted. A NSHP survey in 1999 identified all school health partners working in each district. This information can be used to identify districts with widespread and functional school health and nutrition programs, which may serve as pilot districts for the school health and nutrition program.
  - 5) Health services master team will be trained in how to train teachers to deliver school-based health services.
  - 6) The health education master training team will be selected and trained and will work with NSHP office and other technical advisors to develop a curriculum and lesson plans.
  - 7) A system will be established for the procurement and distribution of drugs.
  - 8) A team of technical advisors will be appointed for the monitoring and evaluation of school health and nutrition programs. They will work with the NSHP to develop a system for closely monitoring of activities in the pilot areas of the project as well as a sustainable method of monitoring school health activities after rollout.
  - 9) The NSHP and technical advisors will work with pilot districts to develop their district school health plan and to devise guidelines for other districts to write school health plans.

#### **Timetable for STAGE 1: Development of National Resources**

| Activity   | Duration   | Completed by |
|--|------------|--------------|
| 1) Meeting to Define roles of Ministries   | 2 weeks    | Month 1      |
| 2) Meeting of the Steering Committee of the National School Health Program to discuss design of SHNP                                 | 2 weeks    | Month 2      |
| 3) Finalisation of design for SHNP and Ratification of SHNP by Ministry of Education and Culture (MoEC) and Ministry of Health (MoH) | 1 month    | Month 3      |
| 4) Situation Analysis of Current District School Health Activities and identification of Pilot Districts                             | 1 month    | Month 4      |
| 5) Health Services Training Team<br><br>Master trainer orientation workshop & Preparation of draft training schedule                 | 2-3 weeks  | Month 5      |
| Finalisation of training schedule  | 1 month    | Month 6      |
| 6) Health Education Training Team<br><br>Master trainer orientation workshop & preparation of draft lessons                          | 1 month    | Month 4      |
| Piloting & finalisation of lesson plans  | 3-4 months | Month 8      |
| 7) Procurement of Drugs and other consumables  | 6 months   | Month 10     |
| 8) Identification and Briefing of Monitoring and   | 1 Month    | Month 4      |

|  |            |          |
|--|------------|----------|
| Evaluation Team  |            |          |
| Development of school health monitoring and evaluation system    | 3 Months   | Month 7  |
| 9) Development of District School Health Plans                   |            |          |
| Work with Pilot Districts to write District School Health Plans  | 2 months   | Month 6  |
| Write Draft Guidelines for writing a District School Health Plan | 3-4 months | Month 12 |

### ***5.2 Implementation of school health and nutrition program in pilot districts (second year)***

The second year of the project will be spent piloting the district school health and nutrition program in a few selected areas. The program will be implemented according to the plan drawn up by the district in Year 1, and will proceed as follows:

#### **Timetable for STAGE 2: Implementation of SHNP in Pilot Districts**

| Activity   | Duration | Completed by |
|--|----------|--------------|
| Training of Teachers   | 1 month  | Month 1      |
| Community Sensitisation  | 1 month  | Month 2      |
| First Evaluation of District SHNP  | 1 week   | Month 6      |
| Second Evaluation of District SHNP   | 1 week   | Month 10     |
| Revision of Guidelines for writing a District School Health Plan based on experiences from Stage 2 | 1 month  | Month 11     |
| Meeting with District, NSHP office and technical advisors to discuss mainstreaming of              | 1 month  | Month 12     |

#### **STAGE 3: Mainstreaming and Scaling Up.**

Each district will develop a plan and then implement it.

# **UGANDA**



# **Preliminary Situation Analysis School Health in Uganda**

**May 2001**

**Seung-hee F. Lee**  
Consultant, Norwegian Education Trust Fund

Prepared for  
Patrick Murphy, AFTH1  
Don Bundy, HDNED



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## **1. Introduction**

Since the implementation of Universal Primary Education in Uganda in 1997, the gross enrollment rate (GER) for primary schools has increased more than 50% to 129% for boys and 114% for girls (UNICEF, 2000). But according to the government school health coordination office, the pace of these developments “has not been matched with the development of policy instruments and programs relating to some of its critical/relevant components such as health promotion in schools.” The school health coordination office estimates that over 50% of school dropouts are related to health factors. In 1998, “out of the total of 315,725 dropouts, about 42,682 (14%) were due to sickness; 3,142 (1%) pregnancy; and 142, 271 (45%) due to lack of interest in schools attributed to among others psychosocial and environmental factors (UPE Newsletter Jan. 2000).” This document briefly explores the current health status of school aged children in Uganda and the existing school health activities and examines the plans in Uganda for a national school health, nutrition and hygiene program to serve school-aged children – even the most difficult to reach.

## **2. Health of school-aged children in Uganda**

The impact of health status on education is well-documented. There are many health related factors that can lead to decreased learning capacity, increased absenteeism and eventually increased student dropout rates. These factors are documented for Uganda from surveys and data collection. Some key items are highlighted here.

### ***2.1 Parasite prevalence***

School aged children in the developing countries are highly infected with intestinal worms and other parasites. These easily treated infections cause students to miss class and to perform lower than normal on their school work. The disappointing scholastic results are caused both by infections themselves as well as the absences that result from the infections – all of which contributes to increased drop out rates.

According to a compilation of WHO trip reports (2000, Schistosomiasis Profile) “Uganda’s levels of prevalence of infection and morbidity due to schistosomiasis are among the highest documented in sub-Saharan Africa. *S. mansoni* is known to be endemic in 36 out of 45 districts and *S. haematobium* is known to be endemic in 4 districts. ... Piida Village, a fishing community...along lake Albert exhibits 72.1% prevalence of *S. mansoni*, and constitutes a typical example of the disease’s epidemiology along the lake.” A recent survey (1998) by MOH of distribution of helminth infection among school aged children living in 18 districts of southern Uganda indicates that at least 12 of the districts have 50% or higher prevalence of intestinal helminth infection and the others had significant prevalence rates (10-50% infection). Additionally, 90% of Ugandan population live in highly malaria-endemic areas according to Roll Back Malaria/WHO.

## **2.2 Nutritional status**

Undernourishment and malnourishment lead to physical and psychological underdevelopment, which impacts students' ability to learn and survive in schools. For example, anemia has been shown to have direct negative effects on testing scores of boys and girls. The studies have also shown that the effects of anemia can be easily reversed with micro-nutrient supplementation.

In Uganda, according to UNICEF data from 2000, 26% of the population are moderately to severely underweight, 38% are moderately or severely stunted and 5% are moderately to severely wasting. Similar or higher rates of undernourishment can be implied for school aged population based on the general population data. According to government surveys of nutritional status of students in schools in 1993 in 34 districts, goiter and anemia are a significant problem in many districts. Anemia is present among the student population from less than 1% to as high as 48% in some districts and goiter is a problem from 0 to 44% of the population in the 34 districts surveyed. Because the survey is several years old, there may be changes in the rates, however, activities specifically targeting school-aged children concerning these problems are unknown to MOES and therefore no dramatic changes are expected. Yet, UNICEF statistics indicate that 95% of the children are receiving Vitamin A supplementation and 69% of the households are consuming iodized salt in 2001 which could be positively impacting the goiter rate.

## **2.3 Sanitation status**

Lack of facilities and poor hygiene affect both girls and boys, although poor sanitation conditions at schools have a stronger negative impact on girls. If there are no latrines and hand washing facilities at school or if they are in a poor state of repair, then many children, especially girls, would rather not attend school than use the alternatives. Additionally, hygiene education is less effective without appropriate facilities in the schools.

Based on UNICEF statistics (2000), currently 50% of the general population of Uganda has safe water with 72% of urban and 46% of rural. 75% has access to adequate sanitation with 96 % for urban and 72% for rural. In a recent MOES (2000) survey of 42 schools, although 100% had latrines, 28% were deemed unsafe, weak or full and therefore inadequate. Additionally only 10% were found to have hand-washing provisions. The majority of the 42 schools visited were secondary and boarding schools which are not representative of the wide spectrum of schools and environments, especially the schools in rural and poorer districts. Another document from MOES/MOH indicates that only 30% of the schools in general have access to safe water.

## **2.4 HIV/AIDS**

HIV/AIDS has several direct and indirect negative effects on the education sector. Young children are a window of opportunity for HIV/AIDS prevention, and prevention requires the difficult task of achieving and sustaining behaviour change. Behaviour change is based on children learning life skills such as making decisions and negotiating.

Despite Uganda's recognized success in curbing the HIV/AIDS epidemic, HIV prevalence "still remains unacceptably high at 8% and the extent of behavior change (is) still limited compared to the level of awareness," as indicated in the recent Bank funded HIV/AIDS Control Program PAD. MOES of Uganda is aware of the great impact that HIV/AIDS has on its sector. In its PIP (Program Implementation Plan) for the HIV/AIDS Control Program, MOES cited examples including: "Increased student absenteeism and attrition from school not only because of lack of finances to pay schooling expenses, but also due to the fact that a number of them, especially the girls, are usually withdrawn to assist in caring for the sick parents and siblings; Absenteeism from work by the professional and support staff due to intermittent sickness, fear, stigmatization, worries, distress and apathy; low productivity and efficiency of staff due to intermittent sickness, absenteeism, desperation and complacency; Increase in number of children with one or both of whose parents are dead due to AIDS (about 70% of the orphans in school are due to AIDS), which has resulted to inadequate guidance, socialization, financial and material support; Inadequate socialization of orphaned children leading to low self esteem and performance."

### **3. Current school health and child development activities in Uganda**

The government of Uganda and its partners in development have demonstrated their commitment to effective school health activities. School health activities are natural complements to programs such as the ECD and HIV/AIDS programs. A few of the activities are described here.

#### ***3.1 Early childhood development***

The government of Uganda (GOU) has had much success in increasing the population's awareness of the importance of early childhood development. The Nutrition and Early Childhood Development (ECD) program which began in 1998 is committed to investing US\$40 million to ensure health and nutritional well-being of young children. The program is based on community and home initiatives for long-term development of healthy environments and healthy children. Specific activities include de-worming and micro-nutrient supplementation with basic sanitation and hygiene education. Using effective information, education and communication (IEC) materials, the activities are being rolled out nationally by MOH. The GOU has already increased the ECD program age from children 0-5 years of age to also include children at 6 years in recognition of the importance of the investment in children's development. The commitment of the GOU to the ECD program calls for follow-up with continued investment in school aged children which would capitalize on the results of the ECD program.

#### ***3.2 Water and sanitation in schools***

Since 1997, WHO with NORAD support has a Water and Sanitation pilot program working with communities to build appropriate latrines for schools and communities in 4 districts. UNICEF school health program has a focus on creating healthy environments, including water and sanitation issues. UNICEF district managers handle 2-3 districts each. The program covers 26 districts that are mostly in the northern province with 5-6 sub-counties per district.

### ***3.3 Health education***

From 1985 to 1995 UNICEF supported the GOU's SHEP (school health education program). The SHEP developed teachers' materials for health education, but integration into actual teaching programs was not successful. FAO has also developed nutrition education training material. Many other organizations, including Africa Medical Research Foundation; BASICS (USAID); Pathfinder; and HAP (Health for Adolescents Program) are involved in various aspects of health education for children.

### ***3.4 HIV/AIDS control program***

With the new HIV/AIDS control program, it is recognized that "in the absence of a cure or preventive vaccine, change in sexual behavior remains the most important approach toward preventing HIV infection" which requires a great role for MOES. The MOES PIP includes : "Strengthening the sector capacity to respond to the epidemic; Sector review of policy on control of HIV/AIDS and identify policy gaps; Review curriculum for the various categories of educational institutions (primary, secondary, business/vocations, etc) in Uganda ; Initiate skills based training relevant to AIDS in all teacher training colleges ; Strengthen of capacity in planning, monitoring and evaluation of AIDS activities in the sector." These are important aspects of effective school health programs responding to the HIV/AIDS epidemic.

### ***3.5 School-based de-worming***

In collaboration with WHO, MOH has already surveyed intestinal parasite prevalence rates in schools in the southern region of Uganda. In late 2001, MOH, with WFP funding, will survey the parasite prevalence rates in the northern region, which will determine the need for mass treatment in that region. Based on the results of the survey, WFP will introduce de-worming activities with its school feeding program which includes 177 schools.

## **4. The national school health program**

GOU recognizes the importance of the school aged group. "Statistically, school children, together with their teachers, form more than 40% of [Uganda's] population," the Minister of State for Primary Education indicated in his speech at a workshop for developing school health program guidelines. 40% of total population represents an important target group for MOH. More importantly, the Minister of Education acknowledged that school health is integral to the delivery of quality education. Without healthy students in healthy environments, the MOES cannot deliver equitable and quality education to all. This indicates the commitment of and the importance of coordination between the two ministries to serve and implement both ministries' goals.

### ***4.1 Government Strategy***

The school health coordinating group led by Jeremias Twa-Twa, School Health Services, Child Health Division, MOH and Susan Oketcho, Inspectorate of Schools, Home Economics & Desk Officer, School Health recently (May 2001) completed a stakeholders workshop funded by UNICEF. The goals of the workshop were to define

the national school health program and to identify the policies and strategies to implement the program. Also the participants deliberated on the implementation framework including roles and responsibilities of various key stakeholders. The workshop included WHO, UNICEF, AMREF, Government Ministries of Education and Sports, Health, Local Government, chief implementers, the local administration, head-teachers, students, curriculum developers, and teacher trainers. The school health coordinating group plans to have the workshop results available in time to have the school health program included in the June 2001/June 2002 Financial Year's, National Budgetary plans for Uganda.

#### ***4.2 A FRESH framework for school health***

It is evident that Uganda has much experience and in-country expertise in implementing the basic and most efficient school health activities. The country has many donor and government supported programs focusing on improving the health and nutrition of children through school and community based simple activities. International organizations and NGOs have supported pilot programs and provided technical expertise and assistance. The elements that emerge are practical activities that are also supported by FRESH, *Focusing Resources on Effective School Health, hygiene and nutrition program*, an inter-agency partnership among UNICEF, UNESCO, WHO, World Bank and others. The FRESH partnership was launched at Education for All Forum in April, 2000 in Dakar and since has been highlighted by UNESCO as a flagship program in achieving quality education for all.

FRESH partnership agreed on a strategy based on the following four core pillars and three supporting actions.

##### **4.2.1: Health-related school policies:**

Health policies in schools, including skills-based health education and the provision of some health services, can help promote the overall health, hygiene and nutrition of children. But good health policies should go beyond this to ensure a safe and secure physical environment and a positive psycho-social environment, and should address issues such as abuse of students, sexual harassment, school violence, and bullying. By guaranteeing the further education of pregnant schoolgirls and young mothers, school health policies help to promote inclusion and equity in the school environment. Policies that help to prevent and reduce harassment by other students and even by teachers, also help to fight against reasons that girls withdraw or are withdrawn from schools. Policies regarding the health-related practices of teachers and students can reinforce health education: teachers can act as positive role models for their students, for example, by not smoking in school.

The process of developing and agreeing upon policies draws attention to these issues. The policies are best developed by involving many levels, including the national level, and teachers, children, and parents at the school level. The policies should be realistic and practical. Once the policies have been developed, using consultative methods, they must be widely disseminated to ensure understanding and compliance at all levels, such as students, parents, teachers and administrators.

#### 4.2.2: Provision of safe water and sanitation – the essential first steps towards a healthy physical, learning environment

The school environment may damage the health and nutritional status of school children, particularly if it increases their exposure to hazards such as infectious disease carried by the water supply. It is a realistic goal to ensure that all schools have access to clean water and sanitation. By providing these facilities, schools can reinforce the health and hygiene messages, and act as an example to both students and the wider community. This in turn can lead to a demand for similar facilities from the community. Sound construction policies will help ensure that facilities address issues such as gender access and privacy. Separate facilities for girls, particularly adolescent girls, are an important contributing factor to reducing dropout at menses and even before. Sound maintenance policies will help ensure the continuing safe use of these facilities.

#### 4.2.3: Skills-based health education

This approach to health, hygiene and nutrition education focuses on the development of knowledge, attitudes, values, and life skills needed to make and act on the most appropriate and positive health-related decisions. Changes in social and behavioral factors have given greater prominence to such health-related issues as HIV/AIDS, early pregnancy, injuries, violence and tobacco and substance use. Unhealthy social and behavioral factors not only influence lifestyles, health, and nutrition, but also hinder education opportunities for a growing number of school-age children and adolescents. The development of attitudes related to gender equity and respect between girls and boys, and the development of specific skills, such as dealing with peer pressure, are central to effective skills-based health education and positive psycho-social environments. When individuals have such skills they are more likely to adopt and sustain a healthy lifestyle during schooling and for the rest of their lives.

Skills-based health education is paramount to the success of HIV/AIDS prevention in future generations. The students become the actors in decision making processes that will help lower HIV/AIDS prevalence rates. These same skills will help them decide to avoid other problems such as intestinal parasite infections and smoking.

#### 4.2.4: School-based health and nutrition services

Schools can effectively deliver some health and nutritional services provided that the services are simple, safe and familiar, and address problems that are prevalent and recognized as important within the community. If these criteria are met, then the community sees the teacher and school more positively, and teachers perceive themselves as playing important roles. For example, improving meal timing or providing snacks, can address student hunger during school, which seriously constrains learning and contributes to poor school performance. Similarly, semi-annual or annual oral treatments can be an effective means of addressing micronutrient deficiencies and worm infections. – Likewise, providing spectacles will allow some children to fully participate in class for the first time.

With treatment of worms, micro-nutrient supplementation is a cost-effective and simple method of reducing certain vitamin deficiencies in school age children. In summary, all of these basic, yet pervasive, health deficiencies can be easily corrected by school officials delivering simple health services in schools.

#### Three supporting actions

The core activities must be supported by three important actions: 1.) Teachers and health workers at school level must work as partners; 2.) communities must be a member of this partnership; and finally, 3.) the students must be active participants in these activities.

### **5. Conclusion and next steps**

As demonstrated above, poor health, nutrition and hygiene are well documented barriers to equitable quality education for all. Several successful interventions are on-going in Uganda. The biggest challenge for GOU is to apply the principles of these pilot programs on a national level – launching a school health program that includes all schools in all areas and all school-aged children. Meanwhile, it is recognized that this difficult task must be accomplished while GOU is working with a decentralized system of government and is facing the challenges of an overcrowded school system.

Acknowledging these capacity constraints, a successful school health program would first address the needs of the poorest and most difficult to reach areas. In this light, the GOU might review its goals and strategies for reaching these groups, especially girls and children in remote, rural areas. A review could help differentiate between short and long term goals by identifying which activities are serving these neediest groups.

Furthermore, successful school health initiatives are highly dependant on full collaboration among coordinating officials, both at the central and district levels. Fortunately, GOU is experienced in cross-ministerial collaboration and coordination at the central level is solid. However, involving district level decision makers, who are responsible for planning and allocating budgets in their school districts, will help ensure that the collaborative nature of these activities pervades through to the local level. Parents and school committees would be key participants in effective district-level implementation. An effective program works with and supports these key implementers.

**Appendix A: People and offices/sites visited**

1. Agnes Bitature, Program Officer, Sanitation WES, Uganda, UNICEF.
2. Narcis Kabatereine, Vector Control Division, MOH (15 Buganda Road; 251 927; 077 492 078).
3. Odette Kweli, Programme Officer, WFP.
4. Sibeso Luswata, Education Program Officer, Uganda, UNICEF.
5. Changu Mannathako, Regional Education Advisor, Nairobi, UNICEF (Visiting Uganda office).
6. Magdalena Moshi, Uganda Programme Coordinator, WFP
7. Collins Mwesigye, Community Water and Sanitation Advisor, WHO
8. Charles Nabongo, Asst. Program Officer, Basic Education, 077 411 385, UNICEF
9. Ms. An-Nakazi, Anastasia, UNESCO, 25 97 13
10. Harriet Nannyonje, Operations Officer, Education, World Bank
11. Richard Okello, MOE-WFP district officer, Kotido, Kolamajo, MOES
12. Susan Noreen Oketcho, Inspector, Home Economics and School Health, MOES, 077 611 365.
13. Sam B. Onek, A. Director of Education, MOES.
14. Caroline Pond, IEC Advisor, Early Childhood Development (075 733 444).
15. Olive Sentumbwe-Mugsia, Family Health and Population Advisor, WHO.
16. Christine Shimanya, HAP Project Coordinator Adjumani, NGO.
17. Dr. Jeremias M. Twa-Twa, Principal Medical Officer, Health Promoting Schools Services, MOH.
18. Two elementary schools in Entebbe district.

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