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TRADITIONAL PATTERNS AND MODERN DILEMMAS:  
DESIGNING LOCALLY APPROPRIATE HEALTH INTERVENTIONS

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TRADITIONAL PATTERNS AND MODERN DILEMMAS:  
DESIGNING LOCALLY APPROPRIATE HEALTH INTERVENTIONS

ABSTRACT

This paper describes the environmental, social, and economic conditions that contribute to the high rates of childhood mortality, morbidity, and malnutrition in Mbita Division, South Nyanza District. This information is used to recommend intervention programmes such as the introduction of improved weaning foods using local resources, improved sanitation and health care delivery, and implementation of community based health care. These interventions are intended specifically to address identified problems in a feasible and culturally appropriate manner. Ultimately, the solutions to community health problems are not technical, but lie with optimal use of human resources.

## INTRODUCTION

A 1983 report entitled "Third Rural Child Nutrition Survey" (Central Bureau of Statistics 1983), examined conditions of health and standards of living in Kenya. The report indicates that South Nyanza District in Western Kenya has the highest rate of childhood mortality in Kenya (216 of every 1000 children die before age two); as well as very high rates of malnutrition and malaria. In addition, the standard of living is lower in South Nyanza than other agricultural areas of Kenya as measured by such indicators as access to piped water, sewage facilities, and the rate of female literacy.

In response to these problems, a socioeconomic and nutritional study was initiated in Mbita Division, South Nyanza, with the support of UNICEF. The study was intended to help identify the key factors that contribute to infant mortality and malnutrition in order to modify health intervention programs to suit local conditions. The ultimate goal is to improve child survival and welfare by implementing more effective and locally relevant development programmes. Additionally the information will serve as a baseline for monitoring the impact of future development projects.

## RESEARCH SITE

The study was conducted in Mbita Division, South Nyanza District, which borders Lake Victoria in western Kenya. Average rainfall is about 750-1050 mm. per year distributed over two rainy seasons. The low and unpredictable rainfall in combination with infertile and eroded soils in much of the district results in generally poor agricultural yields. However, farming, at least for subsistence, remains an important economic activity, with maize and sorghum as the most common crops.

Lake Victoria is also a major economic resource for many Mbita residents; fishing by men and fish processing and marketing by women provide important sources of income for many families. Fish is also the least expensive source of protein in the lakeshore area and is common

in the diet. Many of Mbita Division's residents, especially young men, migrate out of the area for wage labour in the Cities. Others, both men and women, have found salaried work in Mbita's towns, such as casual labour at the agricultural research station or civil service jobs. Local entrepreneurs include skilled craftsmen (carpenters, tinkers), market vendors, shopkeepers, charcoal burners, and wholesale traders in fish and grains.

Most households combine several of these economic activities to meet their needs for cash and subsistence. For example, a husband may fish and do the land clearing for the agricultural season, while the wife cultivates, plants, weeds, and harvests the agricultural field. At the same time she may sell charcoal and dried fish as a secondary economic activity. The specific combination of activities of any given household is influenced by the size and quality of their landholdings, proximity to the lake, educational backgrounds, and to some extent, age of the household heads.

The majority of people are ethnic Luo who live in traditional rural compounds composed of individual houses each linked to the cluster through a male member of the household, and each patrilocal compound is in turn a member of a patrilineal landholding clan. These people with a 'rural' orientation rely primarily on farming and fishing for their livelihoods. In contrast, a small, but growing population have a more 'urban' orientation. These people live in rented housing and engage in trade, wage labour or local manufacturing in one of the several towns within Mbita Division, which serve as the market and administrative centers for the region.

#### RESEARCH METHODS

Data were collected during field research conducted in 1984 and 1985. The information reported in this paper was derived primarily from a series of detailed interviews (N=85) with residents of five sample communities representing the range of environmental and economic

conditions found within Mbita Division. Supplemental information was collected by a team of 10 enumerators and extracted from records kept by two local mission health centers.

The interviews examined the socioeconomic status of the family, income levels, intra-household resource allocation, occupational and educational backgrounds, food production preparation and consumption patterns, use of health care facilities, childrearing practices, and fertility and mortality. All children under five years of age were weighed and measured and then compared with an international standard to determine whether they exhibited signs of malnutrition or were within the range of normal height for age (Waterlow et. al. 1977; WHO 1983).

The data collected during the interviews were analyzed on a woman-focused basis, with a woman and her children viewed as the minimal social group, and a woman's own income plus any remittances from the husband computed as the household operating budget. As the primary concern was to identify the problems and possible solutions affecting the health and welfare of children, the mother's available income (rather than father's income or combined income) was chosen as the unit of analysis, because women are primarily responsible for provision of food and basic necessities for children. Also many of the women interviewed were married polygynously (47 percent of sample women), which complicates attempts to analyze the production and income of the entire household. It is the available income of the mother which primarily determines whether the child receives the proper foods, health care, and preschool education. Additionally, as much of the data concerns food consumption patterns and childrearing practices, the focus on women was also clearly justified as these activities are almost solely a woman's responsibility (Hay 1976; Pala Okeyo 1979).

#### IDENTIFICATION OF PROGRAMME CONCERNS AND INTERVENTION DESIGN

Analysis of the information collected during the research suggests that the main areas for potential interventions are in the fields of nutrition and health, agriculture, introduction of labour

saving devices, and income generation opportunities for women. The ultimate goal - increasing the rate of survival and improving the welfare of children under five years of age -- can only be achieved through comprehensive programs aimed at increasing household food security, protecting children from disease and malnutrition, and easing the labour burdens on women so they have more time for alternative activities which could improve the standard of living of their family. Because of their considerable importance, this paper focuses only on the fields of health and nutrition.

#### NUTRITION AND HEALTH

Many of the most serious and debilitating tropical diseases such as malaria, schistosomiasis (bilharzia), and water borne gastrointestinal parasites are common in Mbita Division. Diseases such as leprosy, sleeping sickness (trypanosomiasis), cholera, polio, and measles, which are eradicated or under control elsewhere, are still prevalent in the area. The effect of these diseases is exacerbated by malnutrition, poor sanitation, and difficult access to health care.

Most residents live in mud wall houses with thatch roofs, only about 20 percent of the households have a corrugated metal roof and only four percent have cement walls (see Table 1.)

Table 1

#### House Types of Sample Families Mbita Division, South Nyanza

	No.	%
No House (live with relatives)	6	7.1
Rental House	10	11.9
Mud House with thatch roof	51	60.7
Mud House with iron roof	14	16.7
Permanent House	3	3.6
Total	84	100.0



Except for those who live in the towns, where population density is high, most families in rural areas do not have pit latrines (ranging from 60 to 80 percent of households, with the higher figure found in the more isolated communities) (see Table II) Water is drawn from unprotected sources, either from Lake Victoria or, farther inland, from streams, rivers, or springs. More than half of the households indicated that they did not treat drinking water, either by boiling or filtering, thus increasing their risk of disease.

Table II  
Presence of Pit Latrines by Community  
Mbita Division Sample

	No Latrine		Latrine Present	
	#	%	#	%
Mbita Town a w	0	0.0	10	100.0
Kasuanga b x	13	56.5	10	43.5
Ufira b y	15	71.4	6	28.6
Gera c z	13	86.7	2	13.3
Salu d z	13	81.3	3	18.8

a = not isolated                      w = high population density  
 b = moderately isolated              x = mod. high pop. density  
 c = isolated                              y = moderate pop. density  
 d = very isolated                        z = low population density

As illustrated in Table III, the results of our nutritional testing indicated that one in four children under the age of five was stunted, an indicator of malnutrition measured by height for age below 90 percent of normal. Stunting reflects the long term nutritional history of a child, thus the presence of stunting in a child indicates he has had consistently inadequate food to sustain normal growth.

Table III

Incidence of Stunting  
Mbita Division Sample

	Normal- Height for Age 90% Standard		Stunted- Height for Age 90% Standard	
	//	%	//	%
First Testing (N=99)*	72	72.7	27	27.3
Second Testing (N=85) <sup>†</sup>	65	76.5	20	23.5
All Observations (N=184) <sup>°</sup>	137	74.5	47	25.5

\* Testing conducted at the end of 1983-84 drought, which had resulted in a nearly complete crop failure for 1984.

<sup>†</sup> Testing conducted during August and September 1985, which was three months after the beginning of the 1985 long rains harvest..

<sup>°</sup> Combined results.

The significance of one fourth of all children showing signs of stunting is not simply that the child will be too small, but that growth and development of the body mirror growth, strength, and development of the internal organs, the brain, and the mental capacity of the child. Many studies have demonstrated that malnourished children do poorly in school and lack the mental potential of healthy children, even if they recover from the nutritional stress (Cravioto and De Licardie 1973; Galler and Ramsey 1985). In addition, children with poor nutritional status tend to become ill more easily, have less strength to recover from illnesses, and are more likely to die from illnesses which would not be fatal for healthy children (especially malaria and measles) (Scrimshaw et al. 1968; Scrimshaw 1971; Wenlock 1980, 1981).

The frequency of malnutrition is clearly one of the major factors contributing to the high rate of infant mortality in Mbita. A wide range of economic and social factors influence nutrition, but malnutrition in Mbita can be most directly linked with child care and feeding practices. Virtually all babies are breastfed from birth. Weaning does not usually occur until the child is 18 to 24 months old, a practice recommended by many health organizations (see Table IV.). However, because they have heavy labour burdens, women are often away from home for many hours working in their fields or engaging in business. Children, even infants, are generally left at home when the mother is away, either in the care of a grandmother, or more often an older sibling (often only four to eight years old)<sup>1</sup>.

Table IV

Duration of Breastfeeding	
Age of Child	Percent Breastfeeding
0-5 months	100
6-11 "	100
12-17 "	75
18-23 "	62
24-29 "	10
30+ "	0

During these hours the baby is unable to breastfeed, a problem which is especially severe during the peak labour periods of the agricultural season when the mother may stay away from the house for six to eight hours daily. As a response to the mother's absence, many babies nurse repeatedly at night. Over 60 percent of women sampled feel their babies breastfeed more at night, when the mother is close, than during the day. However, it is not clear whether this is sufficient to make up for the infrequent breastfeeding during the day.

After four to six months of age, most health professionals recommend that babies receive supplemental food, as the calories supplied by breastfeeding are not sufficient for a growing child. However in Mbita, most children under eighteen months receive little to eat other than nyuka which is a gruel made of water and maize, sorghum, or millet flour about the consistency of milk, or perhaps sweetened tea. Children who are old enough to eat the foods prepared for the whole family will generally receive two meals each day of a stiff, bulky maizemeal porridge (kuon or ugali) served together with a cooked vegetable or fish soup. Breakfast for older children and adults is generally no more than a cup of nyuka or tea and between meal snacks are not the norm.

Thus in general the diet of small children, like that of their parents, relies heavily on bulky, starchy foods consumed twice or three times in a day. These foods provide a feeling of fullness, but the caloric content is low, and the diet lacks variety, providing inadequate protein, vitamins, and minerals. The result is that given the small stomachs of children and the infrequent feeding, it is generally not possible for a child to consume enough of these starchy foods to satisfy their nutritional needs. This tendency, in combination with infrequent breastfeeding, contributes to the high rate of malnutrition found in Mbita's children.

Discussions concerning changing food patterns indicate that the traditional diet of babies was superior to what they receive today. In earlier generations the keeping of cattle was common, with men primarily responsible for cattle care and the women for agriculture. Milk from the cows, ghee (clarified butter), and fresh or dried blood were all regular parts of the diet. These foods were reportedly added to the porridge eaten by infants, thus increasing the nutritional quality of the foods. With shrinking land holdings and a consequent decline in animal grazing area, an increase of male migrant labour, and the increasing commercial value of dairy products, the amount of milk available to families has decreased and the presence of these

foods in local diets has reportedly declined (Ayot 1979:159).

One possible way of improving the diet is to resume this traditional pattern of adding high nutritional quality foods to the porridge of children. As milk is now often too expensive and cow's blood rare, an alternative food which could be used for supplementing porridge is dried fish. Lake Victoria is a productive fishery and many local people are involved in the fishing industry. A common fish harvested from the lake is the sardine-like omena which is dried and sold by the sackful in the local markets. Omena is already a common food in local diets and the least expensive source of protein. Dried, whole omena fish can be ground together with grains (either by hand or power mill), resulting in a flour with superior nutritional quality to ordinary maize or sorghum flour. The porridge can then be prepared in the usual manner, or optimally with a spoonful of cooking fat and sugar added. This necessitates very little extra labour on the part of women, and no alteration in feeding patterns, as porridge would still be the food of choice.

Some local women have already adopted this practice and report that their children find the porridge quite palatable. Despite skepticism voiced by other women, when we prepared the improved porridge at cooking demonstrations, most women found that their children would eat the omena porridge readily. Though the storage quality of this enriched flour is unknown, preservation problems should not be severe, as the climate tends to be dry and the grinding of flour is done frequently, so the processed flour would not be sitting in a store for long periods of time.<sup>2</sup>

Elsewhere attempts have been made to manufacture improved baby foods for commercial sales using local resources (Gibbons and Griffiths, 1984; Easterbrook, 1986), but this approach does not appear to be appropriate for Mbita. Women have very small disposable incomes and rely heavily on foods produced on farm or fish caught locally. Even if low cost baby foods were available, it is doubtful that most women could justify using their scarce cash income to purchase food that would

be consumed by only one member of the family. The advantage of the enriched porridge using oména, in addition to being consistent with traditional patterns of food preparation, is that it relies on resources that are already common in nearly every home, requires very little extra labour, and utilizes oména which is affordable for even poor families.

#### FREQUENT ILLNESS FROM IMMUNIZABLE DISEASES

In addition to the significant nutritional problems in Mbita Division, the frequency and severity of illnesses also contribute to infant mortality. Local physicians report malaria (and associated anemia), diarrheal diseases, measles, and respiratory infections to be the most frequent causes of illness and death among children in Mbita. The Ministry of Health in Kenya recommends use of chloroquine for malaria prophylaxis up to age five, use of oral rehydration fluids for treatment of all types of diarrhea in children, and a series of childhood immunizations including a vaccination against measles. These services are available at no cost in government health centers throughout South Nyanza and in a number of mission based clinics either free or at a nominal charge. The combination of these techniques has been demonstrated elsewhere significantly to reduce child mortality, yet in South Nyanza children still die at an alarming rate from precisely these illnesses.

A number of factors explain this situation: first, many children have not received all of the recommended immunizations. Of the 86 sample children for which records are available, 24% had not received any immunizations, 33% had partial immunization coverage, while only 42% had received all of the immunizations recommended for their age.<sup>3</sup>

Part of this incomplete immunization coverage is attributable to the long distances women must travel to attend the health centers. Most women will take a sick child to a health center for treatment, but they are less likely to do so to attend a maternal/child health clinic (MCH) for preventive medical care such as immunizations, malaria prophylaxis,<sup>4</sup> or for monitoring the growth progress of the child (see Table V.) This becomes increasingly true as the child gets older, the child becomes heavy to carry, the mother may already be

pregnant again, and/or the birth of a new baby may force the mother to leave the older sibling at home in favor of bringing the newborn to the MCH clinic.

Table V.  
Frequency of Attendance at MCH Clinics  
Number of Visits During Previous Six Months  
(N=86)

Number of visits	Percent of children
0	74.4%
1-2	11.0%
3-7	14.6%

In order to increase the number of children who are protected from common diseases, several steps can be taken. First, mobile clinics, at which basic services such as immunizations, growth monitoring, malaria treatment and prophylaxis, and educational services are offered should be expanded to more areas to provide access to a greater number of people. Approximately ten mobile clinics are currently held in remote areas of Mbita division, each one day per month conducted by one of the mission health centers. The popularity of these clinics is growing, and attendance records indicate increasing numbers of children seen each month. However, many parts of Mbita Division are still unserved by any health care. By expanding the number of locations at which these MCH services are offered through increasing the number of monthly mobile clinics, the percentage of children receiving protection and increase greatly.

A second measure which will increase the number of children receiving prophylactic medical care involves additional training of health center personnel. When children are brought into a health center because of illness, they should also be immunized (unless the illness is severe or accompanied by fever). and given malaria

prophylaxis. This is the policy of the Ministry of Health, but it is only haphazardly followed.

In addition to the expansion of MCH services to more areas, health care could be improved by adding a training component for health center staff. Many of the staff of health centers are dedicated and hard working, but there are still inconsistencies in the day to day delivery of services. Repeated examples of improperly completed Child Health Cards, children who were not immunized despite visiting the health center, children who were not properly diagnosed as malnourished, and staff who did not know how to make or use oral rehydration fluids were witnessed in the course of fieldwork.

These lapses in service delivery can be explained by the varying degrees of training of staff, and the inconsistent sharing of knowledge. The government ministries and various non-governmental organizations have held numerous workshops and seminars that offer additional training to representatives of many rural health centers on topics such as nutrition and immunization policies. However the people who most often attend these seminars, the clinical officers and community nurses, are not necessarily the same people who deliver MCH services in the health centers. Because of shortages of trained staff, many health centers use informally trained nurse assistants to deal with the MCH work, and the clinical officer who has attended the seminar may not be able or willing to spend time to instruct his staff on the material learned in a seminar or to follow up the implementation of improved practices at the MCH clinic.

An alternative step to the seminars which might have more impact on improving MCH services would take the form of a travelling, intensive one day refresher course which would be taught to the whole staff in the health center. The intensive course would have the advantage of reaching the whole staff simultaneously, and would take place in the clinic with the trainers working along side to help the staff see how to put these lessons into practice.



#### SANITATION AND WATER RESOURCES

As noted previously, many of the health problems in Mbita are directly attributable to the poor quality of sanitation and water. While measures which are currently being taught at local health centers, such as home water treatment techniques and methods for preparing oral rehydration fluids for treatment of diarrhea are important, programmes designed to improve sanitation should also be included in order to get at the root of the problem rather than only treating the symptoms.

Sanitation in Mbita Division could be improved by encouraging the construction and use of pit latrines. A number of organizations have developed prototype latrines designed for use in areas with scarce water. These new designs, generically referred to as ventilated improved pit (VIP) latrines are designed to minimize offensive smell and insects and are more sturdy than most locally constructed latrines. By constructing these prototypes on public sites such as market places, churches, and meeting areas, the technology can be demonstrated to local people. The opportunity to see and use the VIP latrines will increase local awareness and interest.

Currently, one of the major obstacles to the construction of VIP latrines is the cost of the cement slab and ventilation pipe. Even when relatively low cost alternative materials are used, the cost of a latrine is prohibitive for many families, regardless of their inclination. If the two manufactured items necessary for the latrine could be provided at no cost, or highly subsidized, the technology would be made much more accessible to the populace.

Latrine building competitions between communities (or church congregations, or school districts, or women's groups) would also increase incentives for latrine construction by heightening public awareness and peer pressure to construct latrines, and by providing a goal for the group to attain. Similar competitions have been employed elsewhere with some success, such as contests aimed at improving child nutrition in the Philippines organized through "Mothers' Clubs".

In this case the district government (in conjunction with non-governmental agencies) could sponsor a competition and offer awards (such as contributions towards school building funds, money or materials for establishment of a women's group project, contributions to churches, etc) plus positive publicity to the group which completed the most new latrines in the time allotted. The advantage of the competition is that it provides positive incentives for latrine building, rather than being coercive, and fosters open discussions of the problems created by poor sanitation while providing peer pressure to remedy the situation.

#### PUBLIC HEALTH EDUCATION

All of the health problems discussed in this paper: malnutrition, poor immunization coverage, frequency of preventable illnesses, and poor sanitation facilities, are related to the issue of low public awareness of health issues. If local people learn to prevent disease through better sanitation, nutrition, and home treatment of common illnesses, then improved health and child survival will follow independently of other interventions in health care delivery, agriculture, or economics.

In Kenya, as in many countries, there have been recent efforts to introduce various systems of community based health care (CBHC) which rely on community members teaching one another, and on increasing local level responsibility for their own health care. Inclusion of some form of community based health care in Mbita will help add the necessary educational component to proposed health improvements.

In many CBHC programmes the local community health worker (CHW) is selected by community members for training, and then in turn becomes a motivator and teacher of his or her peers concerning issues of basic health, sanitation, and nutrition. In some cases the CHW also dispenses simple medicines for common ailments, helping to reduce the burden on the health centers.

In Mbita, as in many rural communities in the developing world, there are traditional health practitioners who regularly treat patients. In traditional Luo culture, there are three types of healers, a woman can be a nyamrerwa who is a traditional birth attendant and who offers some pediatric and obstetric care, a jayadh nyaluo is a man or woman who is an herbalist, and an ajuoga (always male) who is a diviner. Their services, especially that of the nyamrerwa, are still commonly used. Over half of the children in our sample were born at home with a nyamrerwa in attendance, and more than a third of women interviewed reported that someone in the family had consulted a nyamrerwa within the last six months.

If the traditional medical practitioners can be more thoroughly incorporated into the overall health care system, by training them in techniques of disease prevention and treatment, and by enlisting their services as educators and motivators, a greater number of people would be reached than through current programmes. Other components of community based health care should be added as time goes on, but the inclusion of the traditional health practitioners at the beginning seems like the most viable and culturally relevant first step.

#### CONCLUSION

This paper has described the status of health and nutrition in Mbita Division and has identified the conditions which contribute to the high frequency of malnutrition and child mortality. The various interventions which have been discussed, the introduction of improved weaning foods, the expansion of mobile clinics, additional training of health care personnel, programmes to improve sanitation, and the establishment of community based health care programmes are all intended to directly influence those factors which contribute to childhood mortality. In each case, the proposed programmes do not require major technological or infrastructural inputs. These programmes are intended to address the causes of childhood mortality, such as the lack of public health awareness, inappropriate allocation of critical resources, and

and imperfect health service delivery.

The recommendations discussed in this paper represent only a portion of a comprehensive package of programmes which was described in detail in a technical report (Chaiken 1985). This report has been distributed widely at the local level (to the District Officer, divisional administrative and health staff, church leaders, etc.), at the district level, and at the national level to the funding agency and Ministry of Health. While some of the recommendations will likely not be adopted, others have already been accepted. The District Officer and various local health center personnel have reportedly adopted a number of the recommendations as an action plan and have recently carried out planning meetings and nutrition awareness workshops for women representing each sub-location within the area. Local health centers are also initiating their own campaigns to improve immunization coverage and expand nutritional testing and education programmes. Representatives of local administration (chiefs, counsellors, etc) recently met to discuss the findings of the research and the implications, but it is premature to speculate about the consequences of their actions. In summation, it appears that the recommendations of the research programme are being discussed at the local and district levels, and individual recommendations have been accepted as policy and programme guidelines.

As described above, the solutions to the problems of childhood mortality and morbidity in Mbita will not be technological, but will come from improvements in health service delivery, educational programmes, and from increased public awareness, motivation, and participation in prevention of disease. The solutions do not rely solely on medical advances, construction of new health facilities, or with increasing the number of medical practitioners, but rather with optimal use of existing resources.

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For any errors or omissions which remain the author is solely responsible.

#### NOTES

<sup>1</sup> Many mothers report leaving a cup of porridge for feeding the baby when they are away from home. However it is difficult to determine how conscientious a small child is about making certain the younger sibling is fed regularly. Casual observations during our fieldwork indicated that these older children eating food intended for a younger sibling which again calls into question the quality of care provided by these surrogate caretakers.

<sup>2</sup> Others have expressed some concern that there may be some risk of toxicological problems resulting from unhygienic treatment or long storage of the dried fish (Alnwick, 1985). However local people recognize that the omena should preferably be eaten shortly after drying. They report that if the omena becomes too old the taste becomes bitter, so they tend to purchase omena only in the quantities which can be used up quickly. This pattern will help reduce the risk of contamination of porridge flour as they omena they would use for porridge would also likely be purchased and used in small quantities.

<sup>3</sup>At the time of our work, the recommended immunizations included BCG for protection against tuberculosis (to be given shortly after birth), oral polio and DPT (for protection against diphtheria, whooping cough, and tetanus), both to be given in three dosages at three, four, and five months, and a single measles immunization to be given at eight months. Because the measles immunization is the last given, many children do not receive it as their mothers discontinue bringing them to the MCH clinics before this age.

<sup>4</sup>The district hospital advises local health centers to administer weekly chloroquine for malaria prophylaxis to children under five. The risk of malaria in Mbita is great, and the consequences severe: malaria can result in anemia, loss of appetite (thus increasing risk of malnutrition), increased susceptibility to other infections, potential brain damage in cases with high fevers, and is a common cause of death among small children. The chloroquine given for prophylaxis does not eliminate the risk of malaria, as chloroquine resistant malaria (especially Plasmodium falciparum which can cause cerebral malaria) is found in South Nyanza. The chloroquine may reduce the risk of malaria, or decrease the number of cases a child might otherwise experience. Alternative drugs which might provide more complete prophylaxis (such as Maloprim or Fansidar) are not advisable to give for an extended duration, and potential long term consequences of taking them is unknown. An additional concern is that if these drugs become widely used there will be an increased risk of Maloprim-and Fansidar-resistant strains of the malaria plasmodia developing, from which there would be no additional pharmaceutical line of defense.

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