ASSESSMENT OF THE PROCESS AND OUTCOMES OF COMMUNITY-IMCI INITIATIVES IN KIBAHA DISTRICT IN REDUCTION OF CHILD MORBIDITY AND MORTALITY

By

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CERTIFICATION

The undersigned certifies that has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled; **Assessment of the process and outcomes of Community-IMCI Initiatives in Kibaha district in reduction of child morbidity and mortality**, in fulfilment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

.....

Dr.David Paradiso Urassa

(Supervisor)

Date: 02/11/2007

DECLARATION

AND

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I, **Ayoub Shekimweri,** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

This work is dedicated to my late beloved parents Mr. and Mrs. Neema Shekimweri. May the almighty God rest their souls in eternal peace, Amen.

Special dedication to my beloved fiancé Joymary Milambo and friend's, Nchimbi and his family .I thank you all for your physical, psychological and economical support you extended to me and tolerance you displayed during my absence at home.

God bless you all.

ABSTRACT

Community recognition of early signs of illness and promptly seek of appropriate health care including home management of simple child illness is a cornerstone of community Integrated management of childhood illness programme (IMCI). Without community IMCI little effects have been observed on child survival and development in spite of trained health workers on IMCI and strengthened health system.

This cross-sectional study was conducted to assessing the process and outcomes of Community integrated management of childhood initiatives (C-IMCI) using conditions of malaria and malnutrition in under-fives, at Kibaha district. The study specifically aimed to assess the prevalence of malaria and malnutrition in under-fives, community knowledge on signs and symptoms of clinical malaria in under-fives, preventive activities for malaria and malnutrition and program implementation success and constraints.

Using mult-stage-cluster random sampling procedure village sampled were (Disunyala, Vikuruti, Soga, Vikuge.Kikongo, Lupunga, Magindu, and Gwata), the study involved a sample of 660 children's under-five years of age with their mothers /guardian from respectively study villages for investigation. Semi-structured interviews, document review, and quantitative survey using a questionnaire and measurement of weight and height to determine nutritional status of children aged 0-5years was used to obtain the data. Quantitative data was analyzed using SPSS.

The two weeks period prevalence of presumptive malaria among under-fives was found to be 30% this was slightly high compare to 29% from the most recent demographic survey of 2004. This might be due to the rainfall which was present prior to the two weeks period of data collection and also the sample sized used during the base line survey was large. Use of ITNs among under-fives in previous night before the survey ranged from 93% to 99% this shows that ITNs utilization had increased dramatically compared to the baseline of 36% in 2004. This shows that the community interventions(C-IMCI) have succeed to raise up awareness of the community on the control measures of malaria.

Mothers /guardian showed high level of knowledge on transmission of malaria whereby 88.6% were able to link mosquito bite and malaria, knowledge on home management of fever, cough and diarrhea. The majority (49 – 76%) were found to score 4 to 5 points on a scale (moderate to high knowledge on home management of fever ,cough and diarrhea diseases).Moderate malnutrition was found to have decreased by 10% from 21%, to 11.6% and the most affected age group was those from 24 months and above with the prevalence of 5.2%. Severe malnutrition was found to be related to age of the child.

There was also significant (P=0.001) difference between mothers /care givers knowledge in home management and level of education.

The findings of this study call for more studies to establish why was there a high knowledge of cause and prevention of malaria among mothers/guardian of under-fives but still high prevalence of presumptive malaria, and also to find more intervention which will address social- economical problem in the society.

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ABREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CHMT	Council Health Management Team
C-IMCI	Community Integrated Management of Childhood Illnesses
CORPs	Community Own Resource Person
DALY	Disability Adjusted Life Year
DED	District Executive Director
DMO	District Medical Officer
DPLO	District Planning Officer
ECD	Early Child Development
ESAR	East and Southern African Region
HIV	Human Immune Virus
IMR	Infant Mortality Rate
IMCI	Integrated Management of Childhood Illnesses
IPT	Intermittent Prophylactic Treatment
ITNs	Insecticide Treated Nets
LBW	Low Birth Weight
MOH	Ministry of Health
MCE	Multi-Country Evaluation
NGO	Non Governmental Organization
NMCP	National Malaria Control Program
NMR	Neonatal Mortality Rate

NIMR	National Institute for Medical Research
PHC	Primary Health Care
RCH	Reproductive and Child Health
RBM	Roll Back Malaria
RHMT	Regional Health Management Team
TDHS	Tanzania Demographic Survey
TOT	Trainer of Trainee
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergence Fund
U5MR	Under five Mortality Rate
WHO	World Health Organization

Chapter one

1:1 Introduction

Every year, nearly 11 million children die before reaching their fifth birthday and most of them during their first year of life. Most of these deaths (98% in 2002) are in developing countries (Zelee *et al* 2004). More than half of the deaths are due to acute respiratory infections, diarrhea, measles, malaria and HIV/AIDS. In addition, malnutrition underlies 54% of all children deaths (Zelee *et al* 2004). Projections based on the 1996 analysis of the global burden of disease indicate that these conditions will continue to be major contributors of child deaths in the year 2020 unless significant efforts are made to control them. So in response to the childhood mortality World Health Organization (WHO) in collaboration with the United Nations Children's Fund (UNICEF) and other technical partners developed an Integrated Management of Childhood Illness (IMCI) as a strategy which focus on improving the major causes of childhood death in developing Countries, rather than on selective one or two causes. Seven out of ten deaths in under-five can be caused by one or combination of several conditions addressed in the IMCI guidelines, (Diarrhea, acute respiratory infection, malaria, malnutrition, and measles) therefore IMCI strategy was also an integrated strategy, as an individual child likely to present with several life threatening symptoms (Victora *et al*.2004). The strategy includes a number of complementary interventions at the community, health facility, and health system levels (Gove, 1997, WHO/UNICEF, 1995) IMCI is a broad strategy with an overall objective of reducing child mortality and

morbidity associated with major causes of childhood illnesses. The strategy focuses on five conditions and includes three main components:

- Improvement in the case management skills of health workers through the provision of locally adapted guidelines on IMCI and through activities to promote their use.
- Strengthening the health system by ensuring availability of essential drugs and other supplies, improving organization of work at health facility, improving monitoring and supervision, and improving referral system and care.
- Improving household and community practices to support child health and development (community IMCI).

Several countries worldwide joined the WHO/UNICEF initiative by making child health and survival an agenda consequently adopting and implementing the IMCI strategy. Tanzania is one of over 80 developing countries in which the IMCI strategy has been implemented.

The IMCI strategy was introduced in Tanzania in 1996 when the country started orientation and development of IMCI training materials and treatment guidelines followed by implementation of the first two components of IMCI i.e. The first component was improvement in the case management skills of health workers through the provision of locally adapted guidelines on IMCI and through activities to promote their use. In other words only the health facility based IMCI was implemented first. The second component was strengthening the health system by ensuring availability of

essential drugs and other supplies, improving organization of work at health facility, improving monitoring and supervision, and improving referral system and care. In other words only the health facility based IMCI was implemented first.

Third component was intended to improve household and community practices to support child health by promoting linkages between health facilities and communities and capacity building among guardian to prevent illnesses and take appropriate action(s) early.

Implementation of c-IMCI

The preparation for community IMCI implementation in Tanzania started in 1999 when a household survey was conducted in 7 districts to identify practices in the community that affect child survival and well being. As a result of the survey 17 key practices at household and community level were identified. A multi-sectoral community IMCI working group was established to work on the training and behavior change communication process, which entailed development and supply of IEC materials. Training of trainers (TOT) national facilitators and Cascade training in the districts began in 2004 and by 2005 thirteen (13) districts including Kibaha district had completed the cascade training up to village level under the support of UNICEF.

1:2 Experiences from other countries

Malawi conducted a national C-IMCI survey in 2000, and the findings after three years showed some moderate achievements in some indicators - care seeking help in 2003 had

risen up to 60% compared with 20% in a 2000 base line survey. Antenatal attendance rose from 73% baseline survey to 85%.Care for development(parents could tell stories to their children, play with their children or fathers could comfort or hold their children) had risen from 5% to 80%(ECD , 2003).Mothers of children 6-59 months with fever reported to be treated for fever at home, was increased from 72 to 76%, use of sulphadoxine pyrimethamine (SP) in home treatment of fever (possible malaria) increased from 18 to 22%.,guardian with knowledge of importance of ITN use to prevent malaria risen from 82 to 87%.

Zimbabwe recent programme audit revealed that communities in IMCI implementing district were better prepared for emergencies e.g. raising alarm in cholera situations.

Uganda in Kasese district the proportion of children with fever treated at home increased from 14 to 26%. Ntungamo district base line survey was conducted 2000. findings was 18% of care givers were able to define blood in stool as a danger sign in 2003 follow-up result shows that there was improvement to 79%. guardian who define child in convulsion or being unconscious as danger sign had risen from 20% up to 73%. (MOH Uganda, 2003).

1:3 Problem statements

One out of seven Tanzania children's dies before their fifth birthday every year due to malaria, diarrhea, pneumonia, under nutrition and neonatal problem, two thirds of the deaths occurring within the first two years of life. Neonatal mortality rate in Tanzania was 40 per 1,000 live births; NMR of 28, an IMR of 88 and U5MR of 137 per 1,000 live birth respectively (TDHS, 1996). The figure shows upward trend over the last few years Infant mortality rate was 99 per 1,000 live births and under-five mortality rate of 147 per 1,000 live births (TDHS, 1999), (RCH, 1999), (UNICEF, 1999/2000) In response to this alarming situation Tanzania adopted the IMCI strategy in collaboration with UNICEF, WHO and other partners to address these problems of child mortality.

Kibaha district started the implementation of IMCI the first component improvement in the case management skills of health workers through the provision of locally adapted guidelines on IMCI and through activities to promote their use and second component strengthening the health system by ensuring availability of essential drugs and other supplies, improving organization of work at health facility, improving monitoring and supervision, and improving referral system and care in 1999.Before the IMCI Under-five mortality rate in Kibaha district was 112/1000 live birth (TDHS, 1999), malnutrition prevalence in children under-five years of age was 44% stunting and 16% underweight, 44% of households have at least one bed net but only 5% of these nets were treated with insecticides. Three years after implementation of IMCI the situation was improved in comparison with the non-IMCI district. From July1999-June2002 under-five mortality

rates was almost identical in IMCI implementing districts, under-five Mortality level were 13% lower in IMCI districts than in comparison district (IMCI, 2004). Nutritional status has improved e.g. severe malnutrition has dropped to less than 2%, moderate malnutrition dropped from 44% to about 20-25% (UNICEF, 2001), ITNs use has also increased from 2% (C-IMCI Baseline Survey, 1999) to 10% by 2002 (ECD, 2003).

In spite of all that effort IMCI as it was implemented in Tanzania did not lead to reduction in under-five mortality of the magnitude expected of 20% in two years (MCE, 2003). A general assessment on the IMCI implementation in the country was done and shown that even if all health workers were IMCI trained and all health systems strengthened as required, the efforts would remain with little effect on child survival and development unless child guardian recognize early signs of illness and promptly seek appropriate health care provider. This emphasize that controlling childhood mortality and morbidity require strong partnership between health workers, parents and other guardian as the later two bears major responsibility in preventing and managing childhood illness. Lack of C-IMCI component may have limited the potential impact of IMCI on mortality and observed behavior change.

Before the introduction of C-IMCI survey was done, and it was found that about 65% of children died outside the health facilities (59% at home), until now we don't know the magnitude of change that has been occurred or observed for the past three years since C-IMCI introduced, though results from baseline surveys indicate that interventions

delivered through the C-IMCI have changed family practices as well as knowledge and altitude. Although there is no direct evidence of impact on child health; If the interventions are found to be effective in improving family practices, it could also be assumed that family practices will bear a positive impact on child health. Though in June 2002, a task force that was working on development of a way forward for C-IMCI provided a report following field visits (which were part of the meeting event) and did "on spot evaluation". They found that C-IMCI has taken off in the visited villages (Kibaha and Kilosa districts) and is beginning to bear very positive results on child survival.

This study was intended to assess the implementation process and outcomes of C-IMCI in Kibaha district at three levels which are district, ward and community to explore the extent to which implementation of some selected practices in the C-IMCI package with focus on two indicators malaria and malnutrition have so far been attained. Also interviews with health providers to supplement and explain the operational (process) activities of the program, and to identify constraints in implementation of C-IMCI activities in the district.

1:4 Rationale

The primary objective of C-IMCI is to strengthen the capacity of guardian; families and community in fulfilling their rights and obligations of providing quality care to children in order to contribute to the reduction of child morbidity and mortality.

Findings from this study will allow us to do comparison of the results, baseline survey which was done before implementation of community -IMCI and current situation, hence it will allow the strengthening of partnership with other community -IMCI stakeholders both from the household level up to the national level and make sure that they are fully utilize the opportunities for scaling up.

Problems which would be identified would allow the policy makers and other partners in reviewing the guidelines so that they could address those problems by tackling their root causes as well as ensuring that C-IMCI activities are sustained by building capacities among communities in solving their own problems. Finally, research findings would provide practical experience, evidence and guidance for Improvement of C-IMCI activities in the district and elsewhere in the country. This study has taken two conditions of malaria and malnutrition as indicators of C-IMCI. Malaria is the number one killer disease in Tanzania, and malnutrition is associated with half of all under-five deaths. Reductions of these conditions are central to decreasing the under-five mortality.

1:5 Broad Objectives

To assess process and outcome of C-IMCI based on malaria and nutritional conditions in under-fives at Kibaha district Tanzania.

Specific Objectives

1. To determine prevalence of malaria and malnutrition in under-fives.
2. To measure the community knowledge on signs and symptoms of suspected malaria in under-fives in Kibaha.
3. To assess care givers preventive practices of C-IMCI for prevention of malaria and malnutrition in the community.
4. To measure care givers/mothers knowledge on C-IMCI preventive activities for malaria and malnutrition.
5. To determine IMCI program success and constraints in implementation of C-IMCI activities in the district.

Chapter two

2:0 Literature Review

Child health research aims to quantify childhood mortality and morbidity. Improve understanding of causes and identify appropriate interventions and translation of research findings into public health practice, and subsequent improvement in survival of children.

Half of the deaths of children under age of 5 years might be prevented by interventions aimed at improving a combination of family practices. Likely to have the greatest impact on saving lives are actions directed at improving care practices that form the bridge between the child and access to health services. As a result, there is great life saving potential for intervention that is delivered through the household and community component of the IMCI strategy (Jones *et al*, 2003).

It will be difficult to achieve the Millennium Development Goal without strategies to bring the health services closer to more children and their families through community based interventions, improving family care practices must be a part of the IMCI strategy or any strategy to reduce child mortality and improve the growth and development of the children who survives.

There is little progress in Africa towards the goal to halve the proportion of underweight children under age of 5 years from 28% in 1999 to 14% in 2015. Ten years after the goal

was set, 27% of children in Africa are still underweight (UNICEF, 2002) During this time, malnutrition among children under age of 5 years has increased rather than decreased in some ESAR countries including Burundi, Comoros, Kenya, Lesotho, Tanzania, Zambia, and Zimbabwe (UNDP, 2002).

But still we can achieve reduction of child mortality by two-thirds from 1999 to 2015, if a full coverage of a package of interventions, effective against the major childhood illness is implemented, this could prevent two thirds of the nearly 2 million-childhood deaths each year in East and Southern African Region (Jones *.et al*, 2003).

Among all of the major available interventions and home based care which include nutrition (breast feeding and complementally feeding) use of insecticide treated material, water, sanitation, personal hygiene and oral rehydration therapy. Community intervention includes micronutrient supplementation; antibiotics for pneumonia, ant malarias and newborn temperature management can have greatest potential for reducing childhood death. So home based care and community intervention through IMCI strategy can help themselves prevent over 900,000 of the death occurring in ESAR.

To date no satisfactory strategy for reducing high child mortality from malaria. But teaching mothers/care givers home management of fevers and provide ant malaria to their sick children with the presence of CORPs may reduce mortality of under-fives in holoendemic malaria areas. According to the study done in Tigray Ethiopia shows that

mortality rate was reduced by 40% in the area were mothers /guardian were taught how to provide home treatment of malaria (Kidane *et al*, 2000).

Treatment seeking for malaria; Reviews of studies conducted to understand people's perception and knowledge on treatment of fever - the primary symptom of malaria and other childhood illnesses, have established that acute febrile illness tends to be managed hierarchically- initially convenience and cheaper options dominating before other alternatives are explored. Research has concentrated on febrile malaria - which is common. We know little through research about how families manage severe malaria which carries a higher mortality, Sub-Saharan Africa - an important basis for improving child survival as a community (Mc Combie, 1996) intervention is still needed.

2:1 Malaria prevention

Tanzania and other developing countries in Africa ITNs have proven efficacy as a malaria control tool in Africa. The effect of ITNs on child survival was assessed by a case control approach in two rural districts of southern Tanzania with high perennial malaria transmission. The results show that an increase of ITNs coverage of infants/children were associated with a 27% increase in survival in children aged 1 month to 4 years. The modest average coverage achieved by 1999 in the two districts (18% in children younger than 5 years) suggests that ITNs prevented 1 in 20 child deaths at that time. Coverage was higher in areas with longer access to the program (community based intervention) (Schellenberg *et al*, 2001). Study done in Gambia rural

area in village were participating in a Primary health care (PHC) scheme bed nets were treated with permethrin at the beginning of the malaria transmission season. Mortality in children in PHC villages before and after the interventions described and compared this with mortality in villages where no interventions occurred (non PHC villages). Over all mortality and mortality attributable to malaria of children aged 1-4 in the intervention villages was 37% and 30% respective of that in the non-PHC villages.

ITNs are simple to introduce and can reduce mortality from malaria through child health community intervention (Alonso *et al*, 1991).

2:2 Malnutrition

The role of malnutrition in child mortality is not revealed by conventional method, despite the long-standing recognition of synergism between malnutrition and infectious diseases. Study results from 53 developing countries with national data on child weight for age indicate that 56% of child deaths attributed to malnutrition, and 83% of these were caused to mild to moderate as opposed to severe malnutrition. These results shows that malnutrition has a far more powerful impact on child mortality than is generally appreciated and suggest that strategies involving only the screening and treatment of severe malnourished will do little to address this problem (Pelletier *et al*, 1995).

In developing countries strategies to reduce child mortality has been the dissemination of simple low-cost technologies such as immunization, training of IMCI and antibiotics, which target specific diseases (Pelletier, 1994). So far little have being done to quantify

the contribution of malnutrition to child health mortality. Papers from 28 community-based studies in 12 Asian and Sub Saharan African countries show the relationship between anthropometric indicators of malnutrition and child mortality.

The accumulated results are consistent in showing that the risk of mortality is inversely related to anthropometric indicators of nutritional status and that there is elevated risk even in the mild to moderate range of malnutrition. This latter result contradicts findings from earlier studies, which suggest that mild to moderate malnutrition was not associated with an increased risk of mortality (Chen *et al*, 1980). Results shows 20% and 75% of all child death are attributed to anthropometric deficits; it was also observed that 46% to 80% of all nutrition related deaths are related to mild to moderate malnutrition (Pelletier *et al*, 1994)

2:4 Family key practices (WHO/UNICEF, 1995)

The 17 key family practices fall under 4 broad categories and these are;

A. Growth Promotion and Development Behavior

1 Exclusive breastfeeding infants for six months.

2 Starting at about six months of age, feed children freshly prepared energy- and nutrient-rich complementary foods, while continuing to breastfeed up to two years or longer.

3 Provide children with adequate amounts of micronutrients, either in their diet or through supplementation

4 Promote mental and social development by being responsive to child's needs for care and stimulating the child through talking, playing and other appropriate physical and effective interaction

B. Disease Prevention

5. Take children as scheduled to complete full course of immunization.(BCG, DPT-HB, OPV and measles)
6. Dispose of faeces including children's faeces safely, and wash hands after defecation, before preparing meals, and before feeding children.
7. Protect children in malaria-endemic areas; by ensuring they sleep under ITN.
8. Adopt and sustain appropriate behavior regarding HIV/AIDS prevention and care for HIV/AIDS affected people including orphans

C. Home Management

9. Continue to feed and offer more fluids, including breast milk, to children when they are sick.
10. Give sick children appropriate home treatment for illness.
11. Take appropriate actions to prevent and manage child injuries, accidents and disabilities
12. Prevent child abuse/neglect and take appropriate action when it occurs

D. Care seeking

13. Recognize when sick children need treatment outside the home and seek care from appropriate providers.

14. Ensure that every pregnant woman receives 4 antenatal visits, recommended doses of tetanus toxoid vaccination, and is supported by family and community in seeking appropriate care especially at the time of delivery and during the postpartum/lactation period.

15. Encourage men to actively participate in provision childcare and be involved in reproductive health initiatives.

16. Follow instructions given by health workers, nutritionist and community based workers in relation to treatment, follow up and referral; (completion of immunization; sleeping under treated nets and feeding advice)

17. Ensure that every pregnant and lactating woman get time to rest by reducing workload.

Chapter 3

3:0 METHODOLOGY

3:1 Study Population

The study population included Trainer of Trainee (TOT) at district level, TOTs at ward level, Community own resource persons (CORPs) at village level, guardian at household level, and children under-five years of age.

3:2 Study Design

The design for the study was a cross sectional employing mixture of methods mainly semi-structured interviews, document review, and quantitative survey using a questionnaire and measurement of weight and height to determine nutritional status of children aged 0-5years. The focus was on specific operational issues in selected wards and villages consistent with C-IMCI implementation.

Data collections for each study population:

CORPs;A pretested Swahili version in depth interview used to generate information on; C-IMCI activities done by CORPs at community level and their opinions on C-IMCI activities in ward, reasons for low implementation and success of those activities if any. Mothers/ guardian at household level; a pretested Swahili version structured interview administered questionnaire were used to generate information on, general knowledge of

IMCI activities like malaria prevention, home treatment for a sick child, recognition of illness and breast feeding practices.

Children's underfive years of age were weighed by using Salter machine, and recorded to the nearest one decimal point while height was taken using measuring tape that was fixed on the wooden board and also recorded to the nearest one decimal point. Measurements were recorded by research assistant.

3:4 Study Areas

The study was conducted in Kibaha district one of the six districts of the Coast Region that is located on the Western part of the region. It lies between latitude 6 – 8 south of the Equator and Longitude 38.19 -39.05 east. Administratively the district council is divided into three divisions (Mlandizi, Kibaha and Ruvu), 5 wards (Kwala, Magindu, Mlandizi, Soga, and Ruvu) and 26 villages. Among the 5 wards 1 has urban condition and 4 with rural conditions. According to 2006 projected population Census Kibaha district council has a total population of 63,075 inhabitants. The population is 49.97% males and 50.03%, female. The proportion of children under one year is 2.6% (1640) and children 5 years is 12.3% (7,758) 15 – 49 years is 25.5% (16,084) and fertility rate is 2.6%.

3:5 Sample size and Sample Size Calculation

The sample size was calculated using the following formula;

$n=Z^2p\ (100-p)/\epsilon^2 \times D$

Where n=sample size,

Z=1.96,

D=2(Design effect),

p=prevalence of malnutrition 20-25% in Kibaha from previous studies

(Baseline survey ECD 1999) Є=margin of error 5%

$n= \frac{4x25(100-25)\ x2=}{25}$

n=600

Assumed that 10% of the study population could not respond therefore increased sample size to 660.The sample size used covered 660 children aged 0 - 5 years, and their mothers /care givers.

3:6 Sampling

-Multistage cluster sampling was adopted and at the first stage, the study involved four wards of Kibaha district, one of them urban ward (Mlandizi) and the other three with rural settings (Magindu, Soga, Ruvu). The idea was to compare situations based on the selected variables between urban and rural populations in the district. At the second stage two villages was randomly selected from each ward making a total of 8 clusters of villages. All mothers /care givers with children, age below five years and from selected

villages were included in study to satisfy a sample size of 660 children's. In order to meet the objectives a mixture of data collection methods was employed. These included review of documents such as Comprehensive council health plan, support supervision schedules, relevant reports, meeting minutes etc. ten community own resource person (CORPs) was conducted TOTs and CORPs were randomly selected.

At the district and ward level emphasis was on operational issues consistent with C-IMCI implementation. In the first day I trained research assistants and the lead researcher spent time to brief the district health authorities about the study objectives and approaches and reviewed the resource documents. Only after those interviews with respondents at the district and ward level, the village level community survey was conducted.

Dependent Variables; there were three dependent variables namely;

(1) Malnutrition, assessed by anthropometric measurements for malnutrition according to;

-Height -for- age (H/A) indicate level of stunting.

-Weight-for- age (W/A) indicate level of underweight.

-Weight-for-length (W/H) indicates level of wasting.

(2) Episode of suspected malaria in the past 2 weeks.

(3) Community knowledge on danger signs for malaria and malnutrition prevention.

Independent Variables were;

-Education level of the mothers, breast feeding, number of children under-five years of age in the family, parent's occupational, marital status of parents.

-All essential family practices relevant to malaria and malnutrition.

-Immunization completeness (BCG, OPV, DPT-HB and MEASLES)

-Vit A supplementation.

Research Team

Recruitment and training of Research assistant

Four research assistant were recruited and trained for about five days before the study starts, sections was based on previous experience in IMCI research work. The training was focus on general interview procedures, on how to obtain concert, maintaining neutrality, privacy issues, and ethics in social research and other aspects related to IMCI and specifically on C-IMCI to orient them with important issues on the subject matter. especially anthropometric measurements and syndromic diagnosis of malaria.

Pretesting

Pretesting was done to review and check for feasibility of the study including the application of the instrument. The exercise was carried out in an area not selected for the study before the actual study takes place; about fifteen structured interview and three in depth interview were done.

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Data collection and Management

Data collection was done by both the research assistant and principal investigator of the study. The principal investigator was also inspecting the completeness of questionnaires on the same day to look for accuracy and completeness. For the qualitative data collection debriefing session was useful in improving the interviewing skills of the team, checking responses and designing questionnaire guide. The in-depth interview was transcribed and then translated into English, themes was obtained before coding and then organized around the themes based on the study objectives. SPSS version 12 statistical software package was used for quantitative data analysis.

Various measuring scale were used example

Knowledge on malaria transmission

Low level of knowledge on malaria transmission= (poor environmental sanitation, sleeping under bed net)

High level of knowledge on malaria transmission= who mention mosquito bite.

Knowledge on generally signs of disease (if caregiver mentioned number of signs)

(Look unwell or not playing normally, not eating or drinking , lethargic or difficult to awake, high fever, fast or difficult in breathing ,vomiting everything and convulsion)

Low level=score 0 – 3 signs of disease

Moderate level = score 4 – 6 signs of disease

High level = score 7 - 8 signs of disease

Knowledge on signs of malaria

(Fever, loss of appetite, unable to play, vomiting, irritability)

Low level =score 0 – 2 signs

Moderate level =score 3 – 4 signs

High level = score 5 or more signs

Knowledge on signs of malnutrition

(Extended abdomen, Palma and /or facial pallor, edema of both feet, loss of weight/ wasting)

Low level = score 0 – 2 signs

Moderate level =score 3 – 4 signs

High level = score 5 or more signs

Knowledge on home management of fever, cough and diarrhea

Low level =score 0 – 3 activities

Moderate level= score 4 -5 activities

High level = score 5 of more activities

3:7 Ethical Considerations

Ethical clearance was obtained from Muhimbili University College of Health sciences, through the MPH Coordinator, other appropriate college authority, and the National Institutes of Medical Research (NIMR). The principal investigator also requested for permission to carry out this study from the Government Officials in the districts where the study was conducted.

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3:8 Informed consent

An information sheet about the study was drawn up in Swahili, explaining why and who is carrying it out, and what it will involve. Respondents were then asked if they had any questions and whether they agreed to take part in the study. Written consent of all respondents was sought. Confidentiality of all study participants was assured.

No respondent refused to participate during this study.

Chapter four

4.0: RESULTS

4.1 Social demographic characteristics village and respondent.

The study covered a sample of 421 mothers or guardian of children aged between 0 – 60 months (Table 1). The guardians were either females or males. All respondents were from eight different villages, which belonged to four wards namely Mlandizi ward (Disunyala and Vikuruti villages), Soga ward (Vikuge and Soga villages), and Ruvu ward (Lupuga and Kikongo villages) Magindu ward (Magindu and Gwata villages).

Table 1.Areas of research and distribution of respondents (Guardian).

Village	Respondents	Percentage
1. Disunyala	48	11.4
2. Vikuruti	112	26.6
3. Soga	54	12.8
4. Vikuge	44	10.5
5. Kikongo	31	7.4
6. Lupunga	39	9.3
7. Magindu	50	11.9
8. Gwata	43	10.2
Total	**421**	**100.0**

4.1 Malaria episodes two weeks prior the study

The mother / care givers with children under-five years old were asked if the under-five had suffered from presumptive malaria in the past two weeks preceding the survey a period that was counted from the day of interview backward. Out of 672 under-five children it was reported that 78 (30%) of them had presumptive malaria in past two weeks prior to the interview. Thus two weeks prevalence of presumptive malaria in eight villages of Kibaha district was found to be 30%.

The prevalence of malaria was seen to vary by age group, (Table 2). The most affected age group was those aged 13 – 24 month 24 (17.5 %) and those who were least affected was the age group of 49 – 60 month 7 (6.7 %). The prevalence of presumptive malaria seemed to decrease as the age of the children increases; these findings were statistically significant (P=0.02).

Table 2. The prevalence of presumptive malaria by age group among under-five children.

Presence of Presumptive Malaria

Age group(months)	n	Under fives with presumptive malaria n	%	P-Value
0 - 12	146	19	13.0	
13 - 24	137	24	17.5	X^2 for trend =5.5
25 - 36	154	17	11.0	P=0.02
37 - 48	130	11	8.5	
49 - 60	105	7	6.7	
Total	**672**	**78**	**11.6**	

It was observed (Table 3) That there was no much difference in the relationship between the sex of the child and having malaria, But relatively female were more affected that 49(13.8%) compared to male 29 (9.1 %).The relation between the sex of children and malaria was found to be statistically not significant. (P=0.06)

Table 3. The prevalence of presumptive malaria by sex among under-five children.

Sex	Presence of presumptive malaria			
		Underfives with presumptive malaria		P-Value
	n	n	%	
Male	317	29	9.1	P=0.06
Female	355	49	13.8	
Total	**672**	**78**	**11.6**	

4.2 Relationship between malaria episodes and social demographic characteristics

Analysis was done to determine the association of presumptive malaria among the under-five and social demographic characteristics of the respondent (Table 4). It has been found that the highest prevalence of presumptive malaria among the children from mothers / guardian whose age 21 to 35. This finding indicates that as the age of mother / caregiver increases the prevalence of malaria also decreases. The difference in malaria prevalence with the age of the mother /caregiver was not significant. (P=0.077)

Table 4.Relationship between Social – Demographic characteristics of respondents (guardians) and presumptive malaria.

Mother/guardian		Presence of presumptive malaria under fives. Under fives with malaria		P-Value
Age groups (yrs)	**n**	**n**	**%**	
<20	302	29	7.6	χ^2=5.12
21 - 35	290	45	15.5	P=0.077
>35	80	10	12.5	
Total	**672**	**78**	**11.6**	
Marital status				
Married	279	243	87.1	χ^2=0.78
Others	393	351	89.3	P=0.376
Total	**672**	**594**	**88.4**	
Education level				
Informal education	276	42	15.2	χ^2=5.95
Formal	396	36	9.1	P=0.01
Total	**672**	**78**	**11.6**	
Occupational				
Peasant	641	73	11.4	χ^2=0.65
Employee	31	5	16.1	P=0.42
Total	**672**	**78**	**11.6**	

Marital status of the mothers /guardian was one of the variables that were studied in relation to the prevalence of presumptive malaria. More than 36(12.9%) of mothers were married, 42(10.7) others (divorced, widow, and not married) (Table 4). The findings showed that the malaria prevalence was lower (10.7%) among children whose mothers were living in a single parent family (widow / divorced).The prevalence of presumptive malaria among the under-five with relation to marital status of the mother was not statistical significant. (P=0.376)

We also asked on the education of mother /guardian the variable likely to influence the prevalence of under-five presumptive malaria. We found that presumptive malaria was highest 42(15.2%) among children whose mother with in formal education compared to 9.1% children whose mother had formal education. There is decrease of prevalence of malaria as the level of education of the mother increase and the trend is significant. (P=0.01) .

We also analyzed the relationship of presumptive malaria among children and mother occupational. It was found that 5 (16.1%) of children who had malaria are found from mothers who are employed (self employed) compare to 73(11.4%) whose mothers are peasant (Table 4). The household with at least one bed net and its relationship with prevalence of malaria were also studied. We found that malaria prevalence was higher 55 (14.6%) among children who lived in house hold with at least one bed net and least 23 (7.7%) was among children who lived in house hold without bed net.

4.3 Perceived cause/ transmission of malaria.

Majority of the mothers /care giver were aware of how malaria is transmitted 373(88.6%) and only 42 (11.4%) were not aware of the transmission of malaria.

Awareness on malaria was not significant different among mothers in rural and urban. (P>0.05).

The Majority of mothers 130 (30.9%) were able to mention more than one symptom of malaria and 112 (26.6%) were able to mention at least one correct symptom of malaria.

The percentage of nets treated with insecticide was among the important aspects to be considered in monitoring and evaluation of malaria control activities as adopted by the C-IMCI program. The research done among mothers /care givers who happened to have used the nets in eight villages of Kibaha, only about 14.4% of their nets were not retreated compare to 85.5% which were treated (Table 5).

Table 5. Distribution of household with nets treated with insecticide.

Household with ITNs treated within the period of six month.

S.N	Village	Respondent	
		no	%
1.	**Disunyara**	39	53.4
2.	**Vikuruti**	89	56.0
3.	**Soga**	41	47.7
4.	**Vikuge**	44	73.3
5.	**Kikongo**	26	54.2
6.	**Lupunga**	30	52.6
7.	**Magindu**	41	50.0
8.	**Gwata**	50	46.7
	All	**360**	**85.8**

The result show that about 93% to 99% of the children under-five years of age slept under bed nets previous night before the survey.

Table 6. Relationship between uses of ITNs among under-fives and level of education of respondent.

Children slept under bed nets

Education level Guardian		**Underfives slept under bed nets**		**P-Value**
	n	**n**	**%**	
In formal education	90	84	93.3	χ^2=19.01
Formal education	582	578	99.3	P=0.001
Total	**672**	**662**	**98.5**	

4.4 Relationship between age groups and weight among under-fives.

The prevalence of malnutrition was seen to vary by age group. The most affected age group was those aged –above 24 months (Table 7) 19 (88.6%) and those who were least affected was the age group of below 24 months 4 (17.4%).

Analysis was done to assess to determine the association of malnutrition among under-five and social demographic characteristics of respondent (Table 7) the relationship between the age of children and malnutrition was found to be statistical not significant (P= 0.2) As the age increases the chances of malnutrition prevalence also increases.

Table 7. Age group among under-fives and nutrition status

Nutritional Status (weight for age)

Age

Nutritional status		**<24 months**		**24 months and above**		**P-Value**
	n	**n**	**%**	**n**	**%**	
Not Malnourished	571	257	45.0	314	54.9	
Moderate Malnourished	78	22	28.21	56	71.8	χ^2=3.16 P=0.2
Severe Malnourished	4	4	17.4	19	82.61	
Total	**672**	**283**	**42.11**	**389**	**57.9**	

It was also observed that there was no much difference in the relationship between the sex of the children and having malnutrition but relatively male were more affected 12 (52.17%) compare to female 11(0.0%). The relationship between the sex of the children and malnutrition was found to be statistically not significant (P=0.3). (Table 8)

Table 8. Sex distributions among under-fives in relation to nutritional status

Nutritional status		Male		Female		P-Value
	n	n	%	n	%	
Not Malnourished	571	273	47.8	298	52.2	χ^2=2.13
Moderate malnourished	78	32	41.0	46	58.9	P=0.3
Severe malnourished	23	12	52.2	11	0.0	
Total	**672**	**317**	**47.17**	**355**	**52.8**	

4.5 Assessment mother/ care givers knowledge on signs of malnutrition.

The knowledge on malnutrition was assessed. Respondent were asked if they know signs of malnutrition. The result show that 176 (41.8%) of the mother had low level of knowledge on signs of malnutrition.

Table 9.Relationship between education level and knowledge on malnutrition.

Knowledge on malnutrition	**n**	**Informal education**		**Formal education**		**P-Value**
		n	**%**	**n**	**%**	
Moderate	275	87	31.6	188	68.4	χ^2=0.36 P=0.5
High	146	40	17.2	106	82.7	
Total	**421**	**127**	**30.2**	**294**	**69.8**	

The result show that the difference in level of knowledge and education between those with low and high was not statistically significant, (P=0.5). (Table 9)

4.6 Relationship between immunization and nutrition status of under-fives

Information on the relationship of malnutrition and vaccination status was collected and analyzed. We found that 2(8.7%) of the children who were partially immunized (after the expected age) had malnutrition compared to 21(91.3%) of the children who were fully immunized. (Table 10) The findings were not statistically significant between

immunization status and malnutrition prevalence. (P=0.2). Being fully immunized reduces the probability of malnutrition.

Table 10.Relationship between immunization and malnutrition.

Nutritional status		**Completed immunization**		**Not completed immunization**		**P-Value**
	n	**n**	**%**	**n**	**%**	
Not Malnourished	571	552	96.6	19	3.32	χ^2=3.25
Moderate Malnourished	78	73	93.6	5	.6.41	df=0 P=0.2
Severe Malnourished	23	21	91.30	2	8.69	
Total	**672**	**646**	**96.13**	**26**	**3.86**	

4.7 Exclusive Breast-feeding.

We found that 3 (75.0%) among children who were breastfed less than six month had severe form of malnutrition while 1 (25.0%) malnutrition were observed for those who breast fed for six month or more (Table11). It was also mentioned by CORPs that; *Among C-IMCI roles, which are being ignored by the community, is exclusive breast feeding and supplementary feeding when the child is sick.*

Table 11.Breast feeding practice and malnutrition.

Nutritional Status		**Breast fed six month and more**		**Less than six month**		**P-Value**
	n	n	%	n	%	
Not malnourished	251	111	44.2	140	55.8	
Moderate malnutrition	22	9	40.9	13	59.1	χ^2=3.25 df=0 P=0.2
Severe malnourished	4	1	25.0	3	75.0	
Total	**277**	**121**	**26.4**	**156**	**56.3**	

4.8Malnutrition prevalence and number of children in house hold.

The houses hold with more that one under-five and its relationship with prevalence of malnutrition were also studied. Result shows malnutrition was higher in among children who lived in house hold with two or more children's and least in house hold with less than two child statistical was significant (P=0.001) (Table 12).

Table 12.Relationship between malnutrition and number of children in household

Nutrition status		**Less than two**		**Two or more**		**P-Value**
	n	n	%	n	%	
Not Malnourished	571	323	56.6	248	43.4	χ^2=13.09
Moderate Malnourished	78	39	50.0	39	50.0	df=2
Severe Malnourished	23	11	47.8	12	52.2	P=0.001

home management of diarrhea diseases, compare to 115 (89.8%) of mothers who had formal education and have high level of knowledge. The finding was statistically significant (P=0.001), (Table 13).

Table 13.Level of knowledge mothers/guardian on home management of child with diarrhea diseases.

Knowledge on home management of diarhoea		**In formal education**		**Formal education**		**P-Value**
	n	n	%	n	%	
Low	90	30	33.3	60	66.6	χ^2=17.62 df=2 P=0.001
Moderate	203	47	23.2	156	76.8	
High	128	13	10.2	115	89.8	
Total	**421**	**90**	**21.4**	**331**	**78.6**	

For home management of fever and cough result was also good, majority who had formal education were able to mention paracetamol for management of fever and tea with lemon for management of cough, 49% to 76%. Compare to 17% to 20% without formal education, statistically was significant (P=0.001). (Table 14) This was also supported by views of CORPS during interview;

Continuous household visit should be maintained in order to sustain understanding and enthusiasm.

Table 14.Percentage of guardian in response to home management of fever, cough and diarrhea diseases and level of education.

Variables	n=421	Level of education: In-formal education		Level of education: Formal education		P-Value
Paracetamol for fever	253	78	(19%)	320	(76%)	P=0.001
Tea with lemon for cough	255	45	(10.6%)	210	(49.8%)	P=0.001
ORS for diarrhea	253	51	(12.1%)	202	(47.9%)	P=0.001

Chapter five

DISCUSSION

The aim of the study was to assess the process and outcomes of Community integrated management of childhood initiatives (C-IMCI) using conditions of malaria and malnutrition in under-fives, at Kibaha district, after the introduction of the program. The prevalence of presumptive malaria and malnutrition among children under-five years of age was studied also to measure the knowledge of mothers /care givers in Kibaha district.

Prevalence of presumptive malaria.

The result revealed that several factors were associated with the prevalence of presumptive malaria among under-fives.We found 30% two weeks prevalence of presumptive malaria in July 2007 among under-five compare to (29%) (DHS, 2006). The result also shows that there is decrease in prevalence of presumptive malaria among under-fives compare to base line survey data (37%) (TDHS ,1999). This two weeks prevalence of presumptive malaria might be due to rainfalls, which were present prior to two weeks period of data collection and also small sample size we obtained during survey compare to large sample size used during demographic health survey. A similar results of increased prevalence of malaria has been reported in other places along lake Victoria The prevalence of reported febrile illness observed by (Kaatano, 2006) was higher than that reported in the recently carried out demographic health survey in rural

communities of Tanzania (TDHS, 2004). Two studies were different; 30% prevalence of presumptive malaria suggests that there is decrease; this implies the community intervention for malaria is effective.

Factors associated with prevalence of presumptive malaria

It is commonly known that without knowledge of new behavior of using treated bed nets it is difficult to change .The fact that 88.6% of mothers /guardian had high knowledge on the cause of malaria could be expected to control transmission of malaria to under-five. This means that knowledge of cause has important role in the control of malaria transmission in under-fives. Mothers with high knowledge of transmission of malaria are at better position to apply control measures for malaria (Wakgari, 2000), (Aikins, 1994). When we look at the sex of the children with relationship to presumptive malaria, we found that there were no much different between the two sexes but the strength of the association was strong in female than in male. This finding complements the finding in other studies, which was done India and revealed that they are both equally exposed to similar environment (Vas *et al* 2004).

(Schllenberge *et al* 2001) Argue that it is the age of the children rather than the sex that determine the prevalence of malaria among the under-five years. In our study, we also found a strong association between the age of a child and prevalence of malaria. In our study it was found that most affected age was 13 to 24 months among whom the

prevalence was 17.5%, compare to 6.7% among those 49 to 60 months old least affected (P=0.02).

Our findings on relation to age and malaria also agree with the findings of the study done in Niger (Françoise *et al,* 2005), which found that risk of malaria is increasing in children aged 13 to 24 months. The high prevalence of malaria among this age group might be due to exposure to poor environment and their development stage of life, which prefers exploration of the environment and hence exposing themselves to the mosquitoes.

The influence of maternal age on the under-fives malaria has been studied .In our study it was found that the mother /care givers below 20 years had 7.6%children with malaria compare to mothers /care givers above 20 years who had 12 to 15.5% prevalence of malaria. This unexpected finding though not statistically significant implies that as the mother age increases the prevalence of malaria also increases. It is possible that, mother who are young they tend to remember the instructions given by CORPs related to control measures of malaria than old mothers, 62.3% of young mothers completed primary education compare to 25% mothers with old age who completed primary education. This means mothers who are old should be frequently visited by CORPs for health education and other supportive advice.

This finding is contrary to result by study done in Kenya (Monica, 1995) who found that those mother below 35 years of age their children experience more episodes of malaria due to lack of knowledge on prevention of malaria.

Mother education is said to be important in the control of malaria among under-fives. Mother who has more years at school was expected to contribute more in prevention of malaria. Our findings indicate that among mothers with in formal education 15.2 % of the children reported to have episodes of presumptive malaria in the past two weeks prior to the study. Mother having formal education only 9.1%of their children had malaria. This finding indicates that those mothers with more years in school their children have less two weeks prevalence of malaria.

The question of mother /guardian education with relation to malaria is quite controversial. A result by study done in Gambia (Koramka, 1995) on level of education of parents and risk of getting malaria found no association between the risk of malaria and the overall education level of parents or guardians of studied children, successful control of malaria depends upon a detailed knowledge of its epidemiology and mother education alone can not be an influential factor in incidence of malaria.

Occupation as a source of income was examined in relation to the prevalence of presumptive malaria. The results show that prevalence of under-fives presumptive malaria was high16.1% among mothers /care givers who were employed (petty trader)

than those who were peasant (11.4%), the finding 16.1% observed that mothers /care givers who were employed (petty trader) are forced to take their young children with them to their working place in the evening. In these working place children were exposed to mosquito bite environment.

Perceived cause /transmission of malaria.

Mothers were asked to mention freely what they perceive as a cause/transmission of malaria. Respondent in the study area gave different answers spontaneously to the question, majority of respondent 88.6% were able to link mosquito bite and malaria while 11.4% mentioned about poor environment sanitation and sleeping without bed nets. Similar to the study done by (Michelle *et al*, 2005) Mali and another study which was done by (Minja *et al*, 1996) Kilombero district whereby only 76% of respondent were able to link mosquito bite and malaria This show that the health education provided to the community about etiology of disease (malaria) is good and it has an important role on preventive measures of malaria.

Use of Insecticide Treated bed Nets.

Utilization of treated bed nets among under-five in previous night before the survey was checked verbal were 93% to99%, compare with baseline survey 21% in1999 (TDHS) and follow up of 36% in 2004(TDHS), this shows that ITNs utilization had increased tremendously in prevention of malaria in under-fives. There must be some other factors

for the increase of utilization of ITNs in this study area in comparison to other area in the country. Apart from discount voucher scheme for pregnant mothers there is also another program, which also support under-five with bed nets (Plan International).

Many studies in Africa have reported success of increase coverage of ITNs in reducing morbidity and mortality among under-five (Fredrick *et al,* 2003) Insecticide-treated bed nets (ITNs) are amongst the most effective tools at our disposal for reducing malaria transmission and mortality.

Home treatment

In general the knowledge of mothers /care givers on home treatment of various condition such as fever, diarrhea and cough was found to be moderate to high 68 % to75% they were able to mention home management of fever that is paracetamol and tepid sponge, use of ORS or sugar and salt home made solution for a child with diarrhea and tea with lemon for a child with cough, minority they have mentioned about, honey, for treating a child with cough the before going to the health facility. Those care givers with formal education had higher knowledge than those without formal education. This findings in relation to the level of education of guardian was statistical significant (P=0.01). Our results are similar to study done in Nigeria (Adenike *et al,* 2005).

Prevalence of malnutrition among children under-five years of age.

An important area in our study was to assess nutritional status of under-fives. In selected study area stunting 3.4% was less than national average of 38% (TDHS, 2004), and

under weight was 11.6% also declined compare national average 21 %(TDHS, 2004). This implies that C-IMC as an intervention on improving child health as well as growth monitoring and promotion, has produced a drop in moderate malnutrition of 10 % same findings was observed Mbeya district 1995 the moderate malnutrition was dropped by 11% as the result of community intervention by special project known as HANDS (Unicef, 1998). In contrast, malnutrition among children under-five in areas not covered by the project actually increased by 7 percentage points.

In relation to the age most affected children were above 24 months 82.6% had severe malnutrition, and 17.4% for the children below 24 months, the situation is improving due to presence of community intervention (C-IMIC, CSPD). This shows that it is either early initiation or delay of complementary feeding (social-economical factor should be also considered), timely introduction of adequate complementary food is important. More work should be done at household level to develop clear strategy for improving maternal and child nutritional status.

When the breast-feed are reduced or stopped and replaced by supplementary foods, it is likely that the cause of malnutrition is due to uncompensated calories provided through complementary foods. Finding was similar to the study of (Sandip, 2001) India.
In relation to sex, there were no associations statistically although findings shows that male were more affected than female but this could be due to family life style and some

time parents preference to the children's. similar findings have been observed elsewhere (Sandip *et al.* 2001).

We have also observed that 10.0% of children who had severe malnutrition were belonging to mothers /care givers who had no formal education and 2.5% of the children were belong to mothers who had formal education. Mother education is associated with nutrition status; women with higher status in the family have ability to make decisions that improve the nutritional status of children. Study done in Mexico by (Gretel. *et al.* 2003) data from the nutrition project used to illustrate the interactions between household economic conditions and maternal education on household diet. This tells us C-IMCI as a program under Ministry of health alone cannot improve nutritional status of the children mult-sectoral collaboration is needed with other sectors like education.

About 8.8% prevalence of malnourished children was observed among those who were not completely immunized according to their age, in comparison with 91.3% of fully immunized children. These findings are contrary to the findings of other studies, as we know that immunization is an indicator of other factors including education, social economical factors etc. The findings from two studies done by (de freites *et al* 1986) and (William, 2006) gave contrary results compare to this study. Of which implies that partially immunized children were at high risk of malnutrition, as they were not protected against infection.

Mothers who breast-feed their children exclusively for six months had less prevalence of malnutrition observed, but for those mothers who breast-fed their children exclusively for less than six month 75% of the children were having severe malnutrition. This means breast-feeding exclusively had big value because the nutrient obtained from breast milk cannot be compensated by supplemented milk alone. Similar study (Sandip, 2001) reported no severe form of malnutrition observed to children 0 to 5 months age group.

Chapter six

Conclusion and Recommendation

The two weeks prevalence of presumptive malaria among under-fives in eight villages in Kibaha district is 30%, which is slightly high compare to the most recent 29% reported by (TDHS 2004). Several factors were found to be associated with malaria among under-fives including socio-economical factors that cannot be modified easily.

Among all under-fives children 88.6% come from household whose mothers had high knowledge on the transmission /cause of malaria. Use of ITNs has a positive impact in reduction of under-five malaria. 85.8% of household was found to use ITNs a night before the interview. Despite of this the prevalence of presumptive malaria was high among under-five. This means that other factor apart from knowledge and preventive measure play an important role in under-five.

Prevalence of malnutrition was found to be on decrease, moderate malnutrition was reduced by 10%. Although some off the practices were not implemented, feeding practice was poorly implemented due to social-economical factors, many children were started supplementary feeding before six month of age, because breast milk were not sufficient, the mother themselves had no enough food to eat.

Some of the household they didn't remember when was the last time corps discusses with them about feeding practices.

1. We recommend the DHMT of Kibaha district to utilize result of this study to plan for another study which will cover the whole district so that they can get a really picture of malaria and malnutrion in the district..
2. Study is needed to establish the difference between high knowledge of cause and prevention of malaria among under-fives with high prevalence of malaria.
3. Village government should put into plan a budget to support C-IMCI intervention.

REFERENCES

Khorshed A.B.M ,Alam Mozumder,Barkat-E-Khuda,Thomas T.Kane,Ann Levin,Shameem Ahmed;(2000);The effect of birth interval on malnutrition in Bangladesh infants and young children; 32;289-300.

Aikins MK, Pickering H, Greenwood BM;(1994); Attitudes to malaria, traditional practices and bed nets (mosquito nets) as vector control measures: a comparative study in five west African countries. Medical Research Council Laboratories, Fajara, Banjul, Gambia. : J Trop Med Hyg.; 97(2):81-6

Alonso PL, Lindsay SW, Armstrong JR, Conteh M, Hil AG, David PH, et al.(1991); The mortality of Gambian children. Lancet; 337:

Mariam Claeson, Jean-Pierre Habicht (2003); Lancet: 362: 233.

Community-IMCI baselineSurveyreport1999.www.afro.who.int/whd2005/imci/tanzania.

Schellenberg D.M, Apontel J.J, Kahigwa E.A, Mshinda.H, Tanner M, Menendezl C ..Alonso P.L:(2000); The incidence of clinical malaria detected by active case detection in children in Ifakara, southern Tanzania. Abstract;

el Samani FZ, Willett WC, Ware JH.(1987); Nutritional and socio-demographic risk indicators of malaria in children under-five: a cross-sectional study in a Sudanese rural community. J Trop Med Hyg. Apr; 90(2):69-78.

Françoise Gay-Andrieu, Eric Adehossi, Véronique Lacroix, Moussa Gagara Maman Laminou Ibrahim, Hama Kournaand Hamadou Boureima;(2005); Epidemiological, clinical and biological features of malaria among children in Niamey, Niger; Malaria Journal, 4:10 doi:10.1186/1475-2875-4-10.

Frederick Mugisha, Jacqueline Arinaitwe;(2003); Sleeping arrangements and mosquito net use among under-fives: results from the Uganda Demographic and Health Survey. doi: 10.1186/1475-2875-2-40

Kaatano G.M, Muro A.I.S and Medard .M; (2006);Care takers perceptions, attitudes and practices regarding childhood febrile among ripian communities of Lake Victoria.Tanzania.Tanzania Health Research Bulletini,Vol 8,No.3 2006pp.155-161.

Gove S. (1997); Integrated management of childhood illness by out patient health workers. Technical basis and overview. Bulletin of the World Health Organization . 75 (suppl.): 7-16.

Gretel H. Pelto, Jeffrey R. Backstrand ;(2003);Interrelationships between Power-Related and Belief-Related Factors Determine Nutrition in Populations J. Nutr. 133:297S-300S, January 2003.

Jennifer B,Edb,Cesar G, et al.(2004); Mult Country Evaluation report; lessons for the evaluation of public health intervention. J Public Health ; 94(3); 406-415.

G, Stekatee RW, Black RE, Bhutta ZA, Morris SS; Bellagio.(2003); Child

Koram k. A. · Bennett S, Adiamah J. H. · Greenwood B. M .(1995); Socio-economic risk factors for malaria in a peri-urban area of the Gambia 1995, vol. 89, n° 2, pp. 132-139 (24 ref.), pp. 146-150

Matthew J. Salganik .(2006); Variance Estimation, Design Effects, and Sample Size Calculations for Respondent-Driven Sampling, J urban Health .. 83(suppl 7); 98-112.

Michelle Rhee, Mahamadou Sissoko,Sharon Perry,Willi McFarland,Julie Parsonnet, Ogobara Doumbo.(2005) Use of insecticide-treated nets (ITNs) following a malaria education intervention in Piron, Mali: a control trial with systematic allocation of households

Malaria Journal, 4:35:10.1186/1475-2875-4-35

Monica A. Magadi. (1995); Status of women and infant/child health in Kenya with particular reference to the high mortality zone in Nyanza province; Comprehensive Summary Report, Union for African Population Studies.

Murray, CJL; Lopez, AD. Eds. (1996); The Global Burden of Disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Cambridge, MA: Harvard University Press on behalf of the World Health Organization and the World Bank.

Pelletier DL, Frongillo EAJ, Schroeder DG, Habicht JP.(1995); The effects of malnutrition on child mortality in developing countries. Bull World Health Organ 1995; 73: 443-448.

Pelletier DL, (1994); The relationship between child anthropometry and mortality in developing countries: implications for policy, programs and future research. J Nutr. 1994 Oct; 124(10 Suppl):2047S-2081.

Sandip Kumar Ray, Akhil Bandhu Biswas, Samir Das Gupta, Dipankar Mukherjee;(2001); Rapid Assessment of Nutritional Status and Dietary Pattern in Municipal Area; Vol. 25, No. 1 (2000-01 - 2000-03)

Tanzania Demographic HealthSurvey(1999) ;www.afro.who.int/whd2005/imci/tanzania.

TanzaniaDemographicHealthSurvey (2004/5);www.afro.who.int/whd2005/imci/tanzania

UNDP/UNICEF report 2002. www.cepal.org/publicaciones

Vas Dev, Sobhan Phookan, Vinod P. Sharma, Suraj P. Anand,(2004); Malaria Research Centre (Indian Council of Medical Research), Delhi, India; DevOps (Pfizer)–India, Jogeshwari (W), Mumbai, India; Am. J. Trop. Med. Hyg., 71(4), pp. 451-456

Victoria C, Wagstaff A, Armstrong Schellenberg J, Gratin D, Claeson M, and Habicht JP. (2003); Applying an equity lens to child health and mortality: More of the same is not enough. Lancet; 362: 233-41.

Wakgari Deressa, Ahmed Ali, Fikre Enquoselassie;(2000); Knowledge, Attitude and Practice about Malaria, the Mosquito and Ant malarial Drugs in Rural Community [*Ethiop.J.HealthDev.* 17(2):99-104]

WHO/UNICEF. (1995); Integrated management of the sick child. Geneva: WHO

Zelee Hill, Betty Kirkwood and Karen Edmond (2004); Family and community practice that promote child survival, growth and development: a review of evidence. Geneva, World Health Organization