



Health Status of People Exposed to Civil War in Sri Lanka

FAMILY HEALTH BUREAU

MINISTRY OF HEALTH SRI LANKA

FUNDED BY POPULATION SERVICES LANKA

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Foreword

The management of humanitarian emergency resulted from the rapid evacuation of civilians trapped in the last phase of war in the North and East of the country would have been one of the most strenuous and challenging efforts made by the Ministry of Health in recent past. Family Health Bureau as the focal point of the maternal and child health programme identified the need to document the health status of these people due to the unique experience they faced and also to find out the priority health concerns among mothers and children after resettlement. Hence, Family Health Bureau in collaboration with Population Services Lanka decided to carry out this survey.

The survey identifies several important health related factors among mothers and children. This information would be very useful in programming future health activities aimed at people resettling in the North and East of Sri Lanka.

I thank Population Services Lanka for financially supporting this Survey. I am also thankful to former Secretary to the Ministry of Health, Dr. Athula Kahandaliyanage for approving and guiding us through the initial phase of the survey. I also acknowledge the efforts made by Dr. Neil Thalagala, Consultant Community Physician, Family Health Bureau and his team for conducting and reporting this survey.

Dr. Deepthi Perera (MBBS, MSc, MD)

Director

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Preface

This survey is an outcome of the efforts of many people. Dr. Deepthi Perera, Director, Maternal & Child Health, Family Health Bureau, entrusted the responsibility of designing and conducting this survey among IDPs to me after she realized the importance of studying maternal and child health perspectives among IDPs. I would like to acknowledge the advice from my colleagues at Family Health Bureau and Faculty of Medicine, Colombo during the planning stage of this survey. The field operations were facilitated by Dr. S. Arulkumaran, Planning officer, Provincial Directorate of Eastern Province and Dr. P. Sathyalingam – Medical Officer of Health Vavuniya. The Public Health Midwives of Vavuniya, Muthur, Kuchaveli, Thampalagama and volunteers attached to these MOHs gathered data. Dr. (Mrs) Hema Nalini Asogan, Dr (Mrs) Anuradha Rasakumar of Family Health Bureau and Dr. S. Arulkumaran of the Provincial Directorate of Eastern Province were the master trainers for the investigators. Dr. (Mrs) Dushyanthi Alagiyawanna and Dr. (Mrs) Hema Nalini Asogan helped me in drafting the survey report. Dr Loshan Moonesinghe, a Consultant Community Physician of Family Health Bureau copy edited the report and provided me with valuable insights for fine tuning the report. I gratefully acknowledge all their efforts.

Finally, I am grateful to Mr. S Suriyamoorthi, Project Manager (IDP) of Population Services Lanka for the motivation and support given to me at all stages of the survey.

Dr. Neil Thalagala (MBBS, MSc, MD)

Principal Investigator

Abstract

The war between Sri Lankan armed forces and LTTE in Mullaitivu and Killinochchi Districts in Northern Sri Lanka reached a peak in its last phase where approximately, 300,000 people, were trapped and faced severe hardships. With the end of the war, these people were evacuated and accommodated in eight welfare villages in Cheddikulam, Vavuniya District. Majority of these people were resettled in the Northern Province and this survey aimed to study selected health related factors among civilians exposed to the war.

The survey included information obtained from 4345 families (16875 members) who were resettled in the Trincomalee and Vavuniya districts. Almost all of them were originally from Mullaitivu and Killinochchi districts. Detailed inquiries were made on health related aspects of infants, children, youth, women including the pregnant, in the form of a descriptive study. Low birth weight, malnutrition, and anemia were identified as significant health problems among infants, and children. Maternal weight gain was poor. Unmet need for family planning seemed to be a major issue among all women in the reproductive age. Communicable diseases were uncommon. Another significant finding was the relatively higher dependency ratio among these communities.

Deaths amounting to 736 were reported in these families from 2007 to 2009. The overall death rate for the period 2007-2009 was nearly 16 per 1000 person years of exposure which is three times the national average. Death rates were calculated after considering the person year of exposure of the all living and dead members of these families from 2007 to 2009 in the form of a retrospective cohort.

There are several important recommendations such as Primary Health Care service provision among the resettled people need strengthening, revamping of nutrition rehabilitation program and expand the family planning services were made.



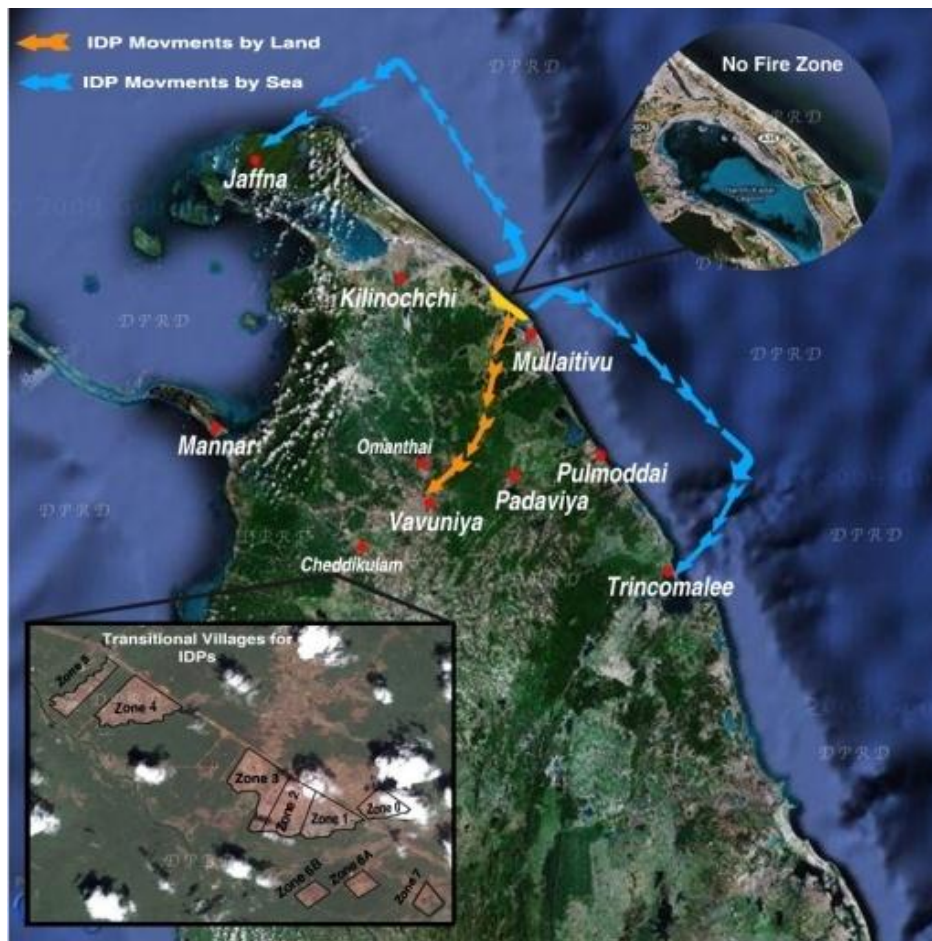
1 BACKGROUND

On 19th May 2009, the Sri Lankan government declared the defeat of the terrorist outfit of the Liberation Tigers of Tamil Ealam (LTTE) and established peace in the entire country. Since July 1983, a guerrilla style war raged on between the government armed forces and LTTE. This war is claimed 80,000 to 100,000 lives. It also resulted in enormous social, economic and cultural setbacks and damage to infrastructure in many parts of the country. In 2006, after a broken peace agreement and a failed ceasefire, the Sri Lankan government launched a major military offensive against the LTTE. During the first half of 2009, this military offensive had culminated in to a ferocious battle which finally brought victory to the government armed forces. In April and May 2009, the Sri Lankan armed forces managed to push LTTE militants to their ultimate strongholds in Killinochchi and Mullaitivu districts. A large number of civilians were also trapped in these districts and were unable to enter the government controlled areas. After a challenging operation, the Sri Lankan armed forces evacuated around 300,000 civilians during the last few weeks of the war. The majority of them were residents of Mullaitivu and Killinochchi districts^(1,2). Most of the rescued civilians were temporarily housed in eight large scale welfare villages situated in Cheddikulam, Vavunia district of Sri Lanka. Others were sent to Jaffna and Trincomalee districts by sea (Figure 1).

These internally displaced people (IDPs) had experienced numerous hardships. They included: spells of food and water shortages, restriction of health and other welfare services, experience of war related injuries, disintegration of families, exposure to epidemics of communicable diseases, being victims of violence and abuse, and loss of family members. The hardships would have been most severe during the period from 2007 to 2009, during which the active war was going on. When they were rescued in April and May 2009, the majority of them were in appalling shapes of health. Naturally women, especially those who were pregnant, and children were the most affected⁽³⁾.

In the early phase of evacuation, in May 2009, the level of mortality among IDPs were reported as 0.7 per 10000 persons per day. It has come down to 0.5 per 10000 persons per day by June 2009. According Sphere project guidelines the baseline level of mortality among emergencies in South East Asia is 0.25 per 10000 persons per day and the emergency threshold is 0.5 per 10000 persons per day^(3,4).

Figure 1 Pathways of people evacuations and location of welfare villages ⁽³⁾



The government, with the help of many local and international non-governmental partners (NGOs & INGOs), undertook the mammoth responsibility of rehabilitating these people. They were provided with accommodation, food, water, sanitation, health, education, recreation and other welfare services. These interventions were coordinated through a joint operational body comprising of personnel from armed forces, civil administration, health, education and other relevant government and non governmental institutions. The Ministry of Health had set up a special Directorate in Cheddikulam to coordinate health care services. A large number of medical and paramedical staff were mobilized to attend the acute health problems of the IDPs, which were numerous and frequently severe. A separate team of primary health care workers were mobilized to ensure essential health care for all with special emphasis on pregnant mothers and children.

A number of primary health care clinics were established within the welfare villages along with two small field hospitals to ensure first contact care for those with acute illness. Referral mechanisms were in place and needy patients were sent to Vavunia and Cheddikulam base hospitals. These 2 hospitals were provided with additional resources which included specialist medical services, drugs, basic laboratory facilities and other medical equipment. In addition several teams of voluntary health professional were available and they supplemented the care provided by the government health system.

Measures were taken to appoint Public Health Midwives (PHMs) and Public Health Inspectors (PHIs) to cover a designated number of tents in each welfare village. A Medical Officer of Maternal and Child Health (MOMCH), Medical Officers of Health (MOHs), Public Health Nursing Sisters (PHNSs) were appointed to ensure proper supervision of Primary Health Care provided by PHMs and PHIs. A large number of volunteers who were organized by local NGOs also worked along with the above mentioned government health workers. They all worked as a team to ensure displaced people receive various health and related interventions in systematic manner. Screening for malnutrition, distribution of nutritional supplements, immunization of children and pregnant mothers, examination of pregnant mothers and children, referring them to field clinics and hospitals, providing family planning services, engaging in health education, screening for water and sanitation problems, fly and mosquito control, supervision of garbage and excreta disposal were some of the salient areas of focus for these primary health care teams. However, several epidemics of diarrhoea, hepatitis A, chicken pox and typhoid were reported from the welfare villages.

Ministry of Health, in collaboration with UNICEF conducted several mass health campaigns to cover all eligible groups of children. They were aimed at achieving complete immunization coverage, screening for malnutrition and providing therapeutic interventions for needy children. The overall prevalence of malnutrition in May 2009 which was 35.6 % (8.8 % of severe acute malnutrition, and 26.8% of moderate acute malnutrition) and that was reduced to 23.9 % (4.1 % of severe acute malnutrition, and 19.8% of moderate acute malnutrition) by August 2009. This reflects the impact of well organized nutrition rehabilitation program implemented in welfare villages.

After mitigating the acute phase of humanitarian crisis the Government started the resettlement of the IDPs. During initial phase, those who had supportive relatives or friends left the welfare village. The others re-settled in Vavunia, Killinochchi, Mullaitivu, Jaffna and Trincomalee districts. The departing families were provided with incentives that included money and material so that they could manage until they were able to fend for themselves. Divisional Secretaries (DS) and Medical Officers of Health were instructed to register the resettlers and thereby ensure systematic provision of healthcare and other welfare services.

The humanitarian emergency created by the sudden exodus of a large number of people during the last phase of the war may be a never recurring situation. Experiences of the people exposed to this long standing conflict could be different in numerous aspects. Literature reviews of health impacts of IDPs following similar situations and efficacy of healthcare interventions for IDPs were hard to find. The hurried nature of arrivals into the welfare villages hindered the systematic recording of health related information of the displaced people. Considering these factors, Family Health Bureau (FHB) identified the importance of obtaining information regarding the health status of the IDPs. The information generated in this survey would be useful for designing health interventions targeted at resettling people in the North and would also enrich the literature on the impact of war on civilian population.

2 OBJECTIVES

2.1 General objective:

To describe health status of children, youth and women exposed to the civil war during the period from 2007 to 2009 in the Northern Province of Sri Lanka and to assess patterns of mortality, morbidity and disability among all people exposed to the same war.

2.2 Specific objectives:

1. To assess the health status of:
 - a. Pregnant women,
 - b. Children [infants, preschoolers (2- 4 yrs), and school going age (5- 14 yrs)],
 - c. Youth (15 to 24years),
 - d. Non pregnant women aged 25 to 49 years,
2. To determine the mortality, morbidity and disability rates among people exposed to the civil war,
3. To assess the outcome of selected health interventions provided for people in the process of rehabilitation.



3 METHODOLOGY

3.1 Study site

The study was conducted in Trincomalee and Vavunia districts, in the locations where the people leaving the welfare villages in Cheddikulam were being resettled. These locations were distributed in 8 MOH areas of these 2 districts. At the time of the survey around 8000 families were registered in these areas.

3.2 Study design

Two study designs were used in the study. The health impact of the civil war among study populations were described using a cross sectional design. A retrospective cohort analysis of dead, missing, live members of families studied was used to estimate death rates.

3.3 Study populations

As the study aimed to answer several research questions, more than one study populations had to be defined.

For the purpose of mortality assessments all resettled family units currently living in these 2 districts comprised one study population. *The family unit is defined as a group of two or more persons related by birth, marriage, or adoption who were living in a single house or a temporary shelter. Single persons who do not have any other relatives were also considered as a unit in this study.*

Orphaned infants & children who were not capable of giving information were excluded. The resulting underestimation of mortality rates was considered unavoidable.

The other study populations included: a) all pregnant mothers b) all infants , c) all children 1- 14 years, d) all youth (15- 24 years), e) all women excluding pregnant (25-49 years) living in the study areas.

3.4 Sample size

Sample size calculations of this study should cover for precisions of two types of estimates: death rates and various percentages related to the health of study populations.

Number of families needed for assessment of mortality rates was calculated as follows. The number of person years (n) required to determine a death rate per 1000 person years with pre prescribed standard error margin at given confidence level was calculated using the following formula ⁽⁴⁾;

$$n = \frac{\mu}{e^2}$$

(n= number of person years required for analysis μ = estimated rate, e = standard error of the rate)

The following factors were considered in choosing the parameters necessary for the sample size calculation. The context in which the death occurred among this population during 3 years from 2007 to 2009 had been unique. Hence the death rates and standard errors obtained from other wars may not accurately reflect the expected rates. The estimated rates were expected to be at least as high as the rates from the non affected areas. Therefore, it was decided to set parameters in such a way that resulting sample size would be adequate to provide precise estimate of death rates that are similar to or higher than the crude mortality rate of the non affected areas of the country. Hence, expected μ was assumed as 0.006, (the crude mortality rate of non affected areas). Standard error “e” was considered as 0.0005 (in order to get 95% CI of 0.001). These figures estimate a number of person years required from the sample as 24,000. Based on a average family size of 5, about 4800 families would provide 24000 person years of exposure during a year of exposure. As sampling was carried out in a multistage cluster fashion the sample size was inflated by a design effect of 3. This was accomplished by increasing the retrospective follow up period for 3 years. This has ensured adequate number of families available for the analysis.

The estimate of other percentages with an expected percentage of 0.5, 95% of confidence, 5 % of absolute precision, and a design effect 2, required 769 subjects in each type of sample ⁽⁵⁾.

3.5 Sampling procedure

The total number of families to be sampled was divided according to the probability proportional to the size (PPS) method among all the MOH areas considered for the study. The total numbers of families resettled in each MOH area was considered as the measure of size used in the PPS sampling. In each MOH area the lists of families resettled were available. These lists were used to select the required number of families from each PHM area. The number of families sampled from PHM areas was also decided based on the PPS method using the total number of resettled families in each PHM area as the measure of size. Within a PHM area identification of families were carried out similar to the sampling techniques recommended for the expanded program for immunization by the World Health Organization ⁽⁶⁾.

3.6 Data collection

Most of the data for the study were obtained by interviewing a family member. Trained group of Tamil speaking PHMs and volunteers collected the data. In each district 15 to 20 investigators collected the data during February and March 2010. The investigators were trained by Tamil speaking master trainers. Master trainers were trained by the Principal Investigator (PI). The training involved in-house inputs that included detailed discussions on interviewer schedules, sampling procedures, ethical concerns, follow-up of the respondents who were found to have problems, and data quality assurance procedures. The in-house training was followed by a field training session among sample similar to the study population.

The interviewer schedule was formulated using the information obtained by reviewing literature, by studying interventions carried out in welfare villages, and by obtaining the views of personnel who worked in welfare villages.

Apart from interviewing respondents, weight and height of infant and children were measured and serum hemoglobin (Hb) levels were determined using Hemocue strips. The Hemocue strips and lancets were incinerated after use. These measurements were carried out by PHMs as it was a part of their routine

activity. Refresher training on Hb assessment was conducted to standardize measurement procedures. The measurements were taken at a separate clinic held for this purpose.

3.7 Data analysis

The profile of the sample was described using relevant summary measures that included percentages, means along with respective 95 % confidence intervals. Health indicators were also summarized in similar manner. Sex and age differentials were also included where relevant. Death rates were calculated as the number of events per 1000 person years, over 3 year period from 2007- 2009. Data were entered using EPIDATA PASW 18 and STATA 10 software programs were used in the analysis.

4 ETHICAL CONCERNS

Informed consent and freedom of choice to be recruited: A preliminary explanation regarding the purpose of study was given to the potential participant families through area PHMs and a request for participation was made. On the day of the interview, investigators obtained informed consent of the respondents using a standard information sheet and consent form. The parents (mother, father or a guardian) provided consent for enrolling infants and children. The right of the respondents' to withdraw from the interviews at any time was clearly indicated at the outset of the survey. All the investigators were trained to respect respondents' wishes without hesitation.

Attending to problems: The families were informed to contact the area PHM for any concern or complaint arising out of the survey. PHMs were accordingly informed to be present in the field during the survey time. The investigators were instructed to inform both relevant respondents and area PHM about any health concern identified among respondents.

The women and children found to have problems (physical and mental) were referred for relevant services. The investigators were made aware of the potential problems during their training. A clear referral pathway was defined through PHC staff. The primary health care team (i.e. MOH and his team) who were involved in caring for these people were also involved in the survey and they were kept on standby for referral purposes. The PHC staff were informed about the survey and special planning meetings were conducted to ensure their understanding and proper organization of potential referrals and follow ups. Those who were found to have mental health problems were referred to relevant secondary care facilities through the area MOH. Health problems that were not already detected were expected to surface during the interviews. The investigators were trained to inform these to the area PHM with relevant identification details. Arrangments were made for the area PHM to revisit relevant households and further clarify problems and to refer people with problems to the area MOH. Then the area MOH attended problems or made necessary refferals.

Confidentiality and Privacy: Confidentiality and privacy of the respondents were maintained. Measures were taken to ensure only the relevant respondents and investigators were present at the time of interview. The identification details of the respondents' were gathered. This was helpful in establishing cohort of people so that there would be a framework for assessing the long term health impact among them. In

addition identification details were needed to ensure the possibility of tracing the respondents having health problems.

At the end of every field day completed questionnaires were collected by supervisors and transferred to the data manager who was placed at the Regional Director of Health Services (RDHS) office of Trincomalee, and MOH office Vavunia. Data sheets were finally sent to the custody of PI on fortnightly basis. Thereafter questionnaires were only accessed by the PI and data entry personnel. The data sheets were stored at the Family Health Bureau. There data sheets would be destroyed after one year period from the time the final report is published. The digital files of the data were encrypted to hide personnel information and stored in the internet. Publications arising out of the study would not reveal personal identities of the respondents.

Handling blood: The blood tests for Hb examination were carried out by using disposable Hemocue kits. Trained PHNS/PHMS drew the blood. They are well experienced at this task as this is one of their routine activities. Parental consent was obtained for drawing blood by pricking fingers of children after explaining the purpose. If parents refused that particular child was not subjected to Hb tests. Those who were found to have anemia were referred to PHC team and to the local hospitals depending on the need. The necessary iron supplements were provided to local MOHs through Family Health Bureau.

Utility of information vs potential harm: No risks were anticipated for respondents after participating in the study. The knowledge gained through the research was expected to provide information on wide array of concerns related to the health of re-settled people in the North and East. In addition it will enrich the literature on the broader subject of the impact of humanitarian emergencies on the health of exposed people. The study identifies many salient health problems currently being experienced by these people. This information will be utilized to streamline the maternal and child health and other health programs directed at resettling communities.

Permission for the study: The permissions of relevant authorities (The Secretary of Health, Government Agents, Provincial Directors of Health, Regional Directors of Health of the study districts) were obtained for conducting the survey.

Conflict of Interests: This study was an observational study and funded by the Population Services Lanka. There were no conflict of interests between the organization and the researchers who are officials of the Ministry of Health with regard to the research outcome.

Ethical Clearance: the Ethical Review Committee of the Sri Lanka Medical Council granted the approval for the research protocol.



5 PROFILE OF THE STUDY SAMPLE

Mulaitivu and Kilinochchi could be considered as the most war stricken areas of the North during the latter period of the war since January to May 2009. Being the strong hold of the LTTE, a reasonably higher percentage of youth and young adults in these areas would have fought in the war at some point in time. Hence they would have been exposed to many risks, suffered injuries and even died. The food and drug and other welfare services and supplies for the civilians were provided only through armed forces and humanitarian organizations. The presence of such restrictions over 3 year period would have significantly endangered their nourishment, health and wellbeing.

A total of 4407 families were surveyed. Completed data sheets were available for 4345 families (98.6% response rate) which consisted of 16875 people. They included:

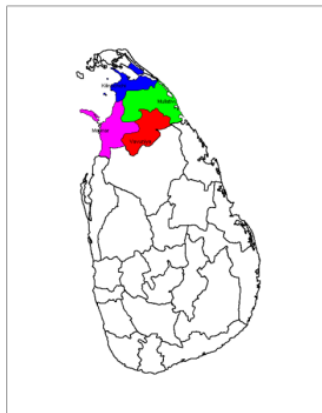
- a. Infants - 616
- b. Children (1-14 y) – 2913
- c. Youth (15 -24 y) – 1603
- d. Pregnant women- 364
- e. Non pregnant women- 2969

In addition the survey revealed information related to 736 family members who have died during 2007 to 2009 period and 821 family members who were disabled as a consequence of the civil war.

5.1 Places where respondents lived during the conflict

Of the 4345 families, the majority lived in Mulaitivu (90.3%) and Kilinochchi (8.4%) districts. A small percentage of families (1.3%) were from Vavunia and Mannar (Figure 1).

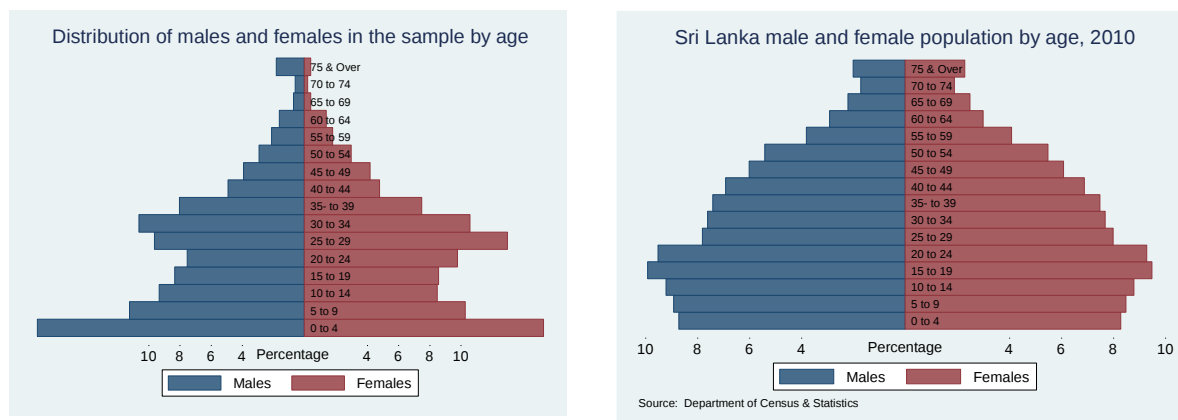
Figure 1 Map of Sri Lanka depicting the districts where respondents lived during the conflict



5.2 Age Sex structure

Total sample of 16875 persons included 8292 males and 8583 females, resulting in a sex ratio of 96.6. Figure 2 compares the population pyramids based on the sample and the overall population of the country.

Figure 2 Comparative histograms depicting the age and sex distribution of the sample and Sri Lankan population in the year 2010.



A clear dent is seen in the pyramid representing the 15 to 29 year age group. This may be probably due to the deaths of youth and those in early adulthood as a consequence of the war. In addition there is a clear disparity in the age group above 65 years where percentages of females are decreased. The sudden increase of top most layers in both pyramids is an artifact created by the amalgamation of all years 75 and above in a single category.

5.3 Dependency ratios

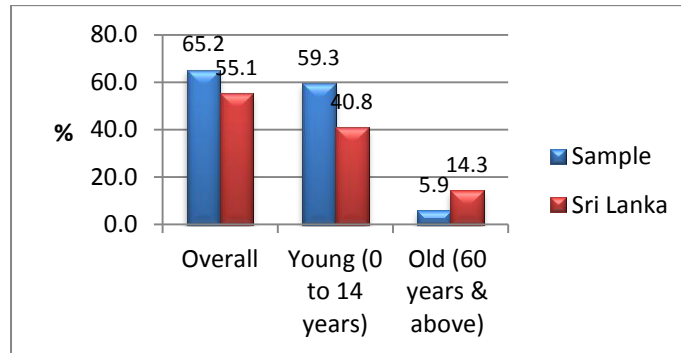
The ratio of the dependant population (age 0-14 y and 65 y and over) to the working (productive) age group population (15-y -64y) is called dependency ratio.

Three resulting percentages are considered to reflect the burden that has to be borne by the productive group of personnel (i.e. those in 15- 64 year age group) in the population in terms of providing for the needs of those in age groups 0-14 years and 65 years and above.

At present the Sri Lanka is known to enjoy the benefits of the demographic window created by the history's lowest dependency ratios. However, the findings indicate that the dependency ratios of war affected populations are much higher than the national averages. The probable reasons would be due to

the loss of lives of people in productive years due to the war and relatively higher fertility rates in the study population.

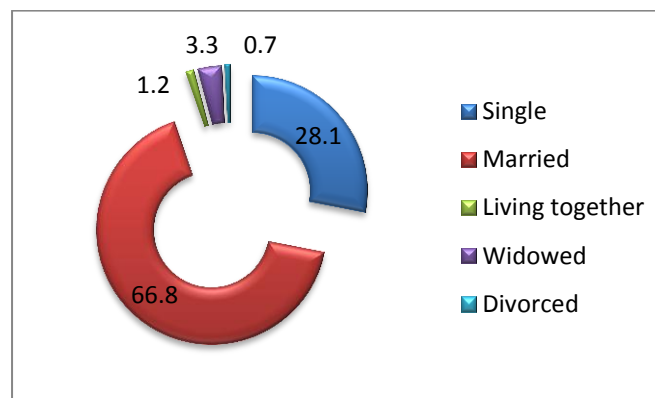
Figure 3 Comparison of dependency ratios of the sample with that of Sri Lanka



5.4 Marital status

The majority (67%) of the adults were married. About 3.3% of the sample comprised of widowed persons. Figure 4 presents the distribution of respondents by marital status.

Figure 4 Marital status of adults





6 HEALTH OF THE PREGNANT MOTHER: SELECTED INDICATORS AND ASSOCIATED FACTORS

Several associated factors: Age, marital status, parity, antenatal care and nutritional indicators among pregnant mothers were studied.

6.1 Age , marital status, and parity of pregnant mothers

A group of 364 pregnant mothers were surveyed. According to figure 5 ages of the pregnant mothers ranged from 16 to 43 years. Mean and median ages of them were both 27 years (SD=5.6 years). Teenage mothers (less than 19 years) accounted for 9.1 % of the sample while 10.7 % of mothers were more than 35 years (elderly mothers) of age.

Figure 5 Distribution of pregnant mothers by their age

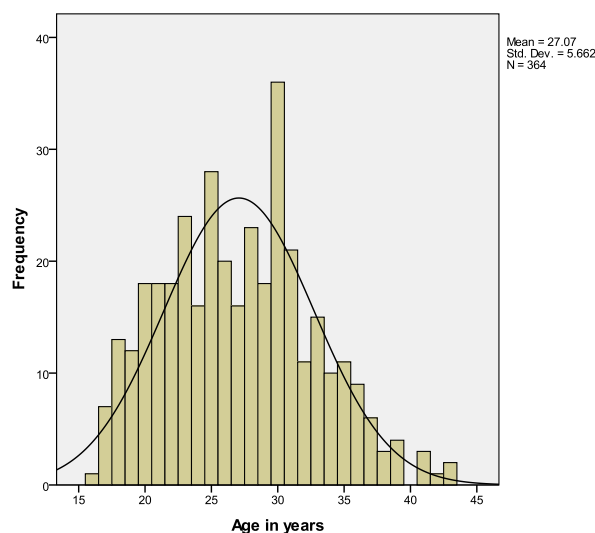
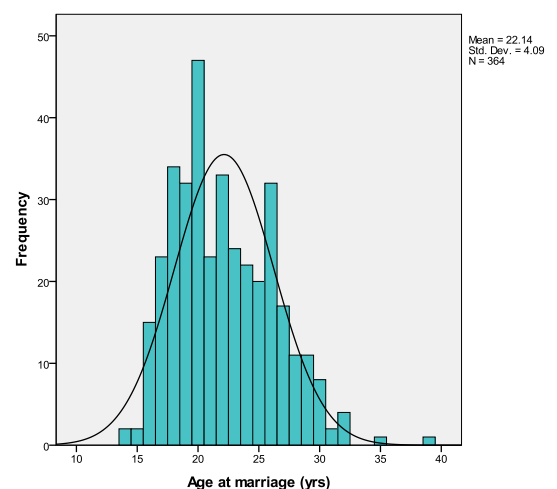


Figure 6 Distribution of pregnant mothers by their age at marriage

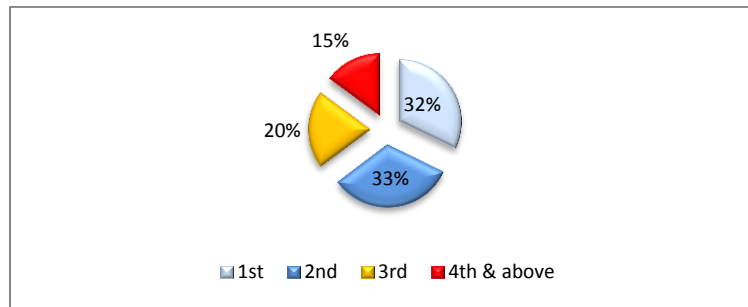


Age at marriage ranged from 14-39 years. However the ages at marriage of the seemed to cluster near the lower end of the age spectrum. Nearly 1/3rd were married by the age of 19 years. Mean and median ages of marriage were 22.1(SD=4.1) years) and 22 years respectively (Figure 6).

The majority (96.7 %) of pregnant mothers were married. Further, 2.7%, were living together with their partners without bring legally married. Only one (0.3%) mother in the sample was unmarried while another one (0.3%) was widowed.

Figure 7 shows the parity (whether the pregnancy is 1st, 2nd etc...) of each pregnancy studied.

Figure 7 Pregnancies by parity



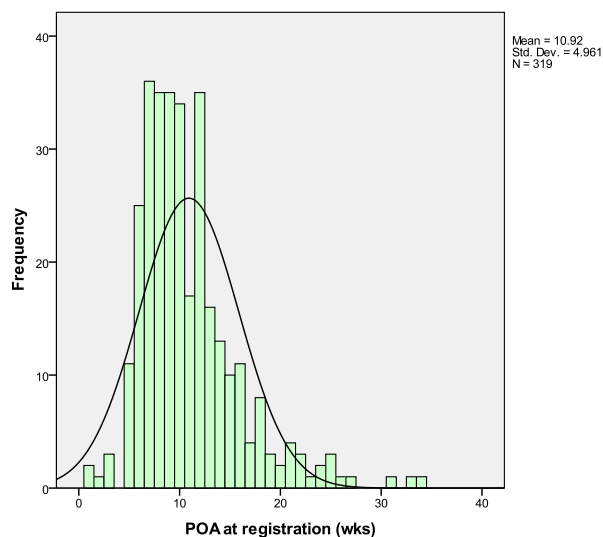
Considerable percentage of pregnancies were para three (20%) or higher (15%).

6.2 Ante-natal care of pregnant mothers

6.2.1 Registration for care

According to maternal care policy of the country every pregnant mother is supposed to be identified and registered by the area PHM. Measures has already been taken to enroll all resettling communities in the local health networks. Likewise, 87.6 % (95%CI: 84.2%-91%) of pregnant mothers were already identified and registered by area PHMs. Of them 35% were registered before 8 weeks of period of amenorrhea (POA) while 73.4% were registered within first trimester. Further 25.7% were registered during the second trimester of pregnancy. Figure 8 shows that most pregnant mothers were registered in early pregnancy.

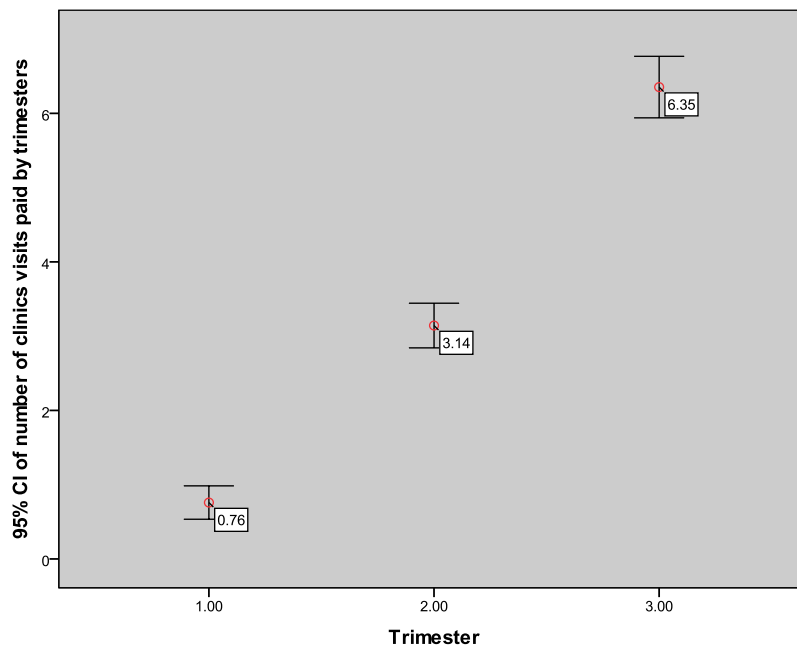
Figure 8 Distribution of mothers by POA at registration.



6.2.2 Ante-natal clinic attendance

The aim of early registration is to ensure clinic attendance of pregnant mothers as early as possible. About 92.8% (95%CI: 90.2-95.5 %) of pregnant mothers had paid at least one ante-natal clinic visit. Number of clinic visits seems to have increased satisfactorily with POA. Figure 9 shows the pattern of increase in the average number of clinic visits with advancing trimester. On average 6 clinic visits were paid by a pregnant mother reaching the last trimester.

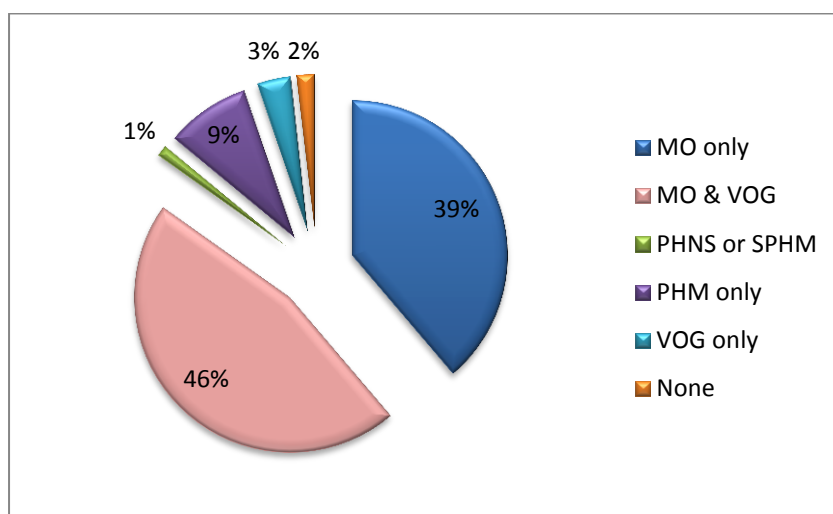
Figure 9 Number of average clinic visits paid by pregnant mothers



6.2.3 Medical screening by health personnel

The following graph shows the percentage of pregnant mothers who were examined by different types of health personnel during their ante-natal clinic visits. About 88% of pregnant women were examined by qualified medical personnel. Of them 39 % were examined only by an ordinary medical officer(MO). About 3 % were examined only by an obstetrician (VOG). Both a MO and VOG had examined the remaining 46%. Nearly 10 % were only examined by paramedical staff (1% by PHNS/SPHM, 9 % by PHM alone). Two percent were not examined by anybody despite clinic attendance (figure 10).

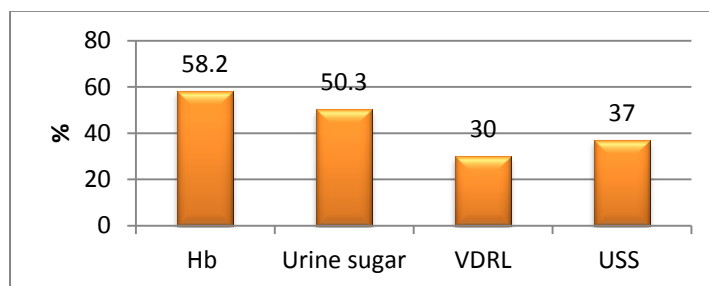
Figure10 Type of personnel who examined pregnant mothers during antenatal visits



6.2.4 Investigations

Inquiries were made to ascertain whether pregnant mothers were offered basic investigation facilities. The following figure shows the percentage of mothers on whom serum hemoglobin (Hb) , urine sugar, VDRL antibodies and Ultrasound scans (USS) were carried out.

Figure 11 Percentage of mothers who had the basic investigations performed



Serum Hb and urine sugar were found to be the most common investigations performed on pregnant mothers, and percentages of mothers offered with these two investigations were 58% and 50% respectively. VDRL and USS were carried out on 30 % and 37 % of pregnant mothers respectively.

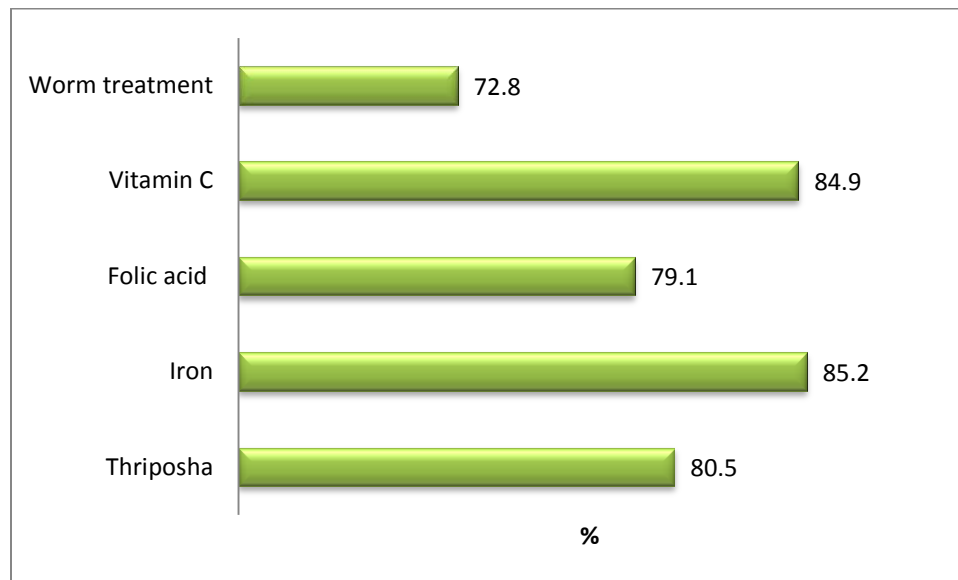
6.2.5 Provision of vaccines, drugs and nutritional supplements

Present maternal care package of the country include 2 vaccines. All women are expected to be immunized with rubella vaccine before they conceive and all with anti-tetanus vaccine during the antenatal period.

Approximately 85.4% (95%CI: 81.8-89.1) mothers were reported to be immunized for rubella while 76.9 % (95% CI: 72.6-81.3%) were immunized for tetanus.

All pregnant mothers are supposed to receive nutritional supplements (Thriposha, Iron , folic acid and vitamin C tablets) and worm treatments during antenatal periods. Figure 12 shows the percentages of mothers who had received these supplements from their clinics.

Figure 12 Percentage of mothers supplied with nutritional supplements and worm treatment

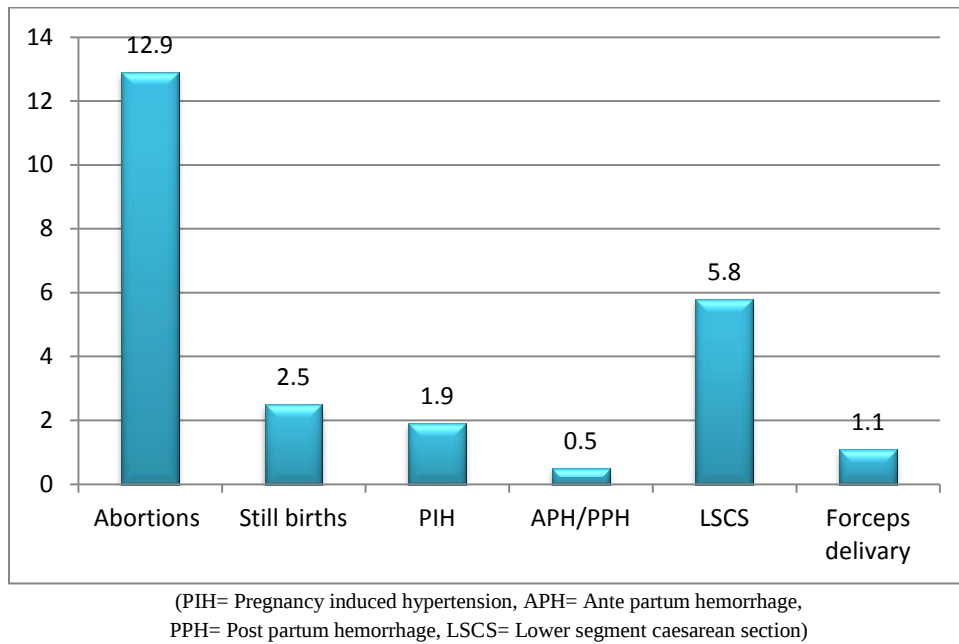


Majority of pregnant mothers seemed to have received the relevant supplements and worm treatment.

6.2.6 Screening for past obstetric problems and risk factors in the present pregnancy

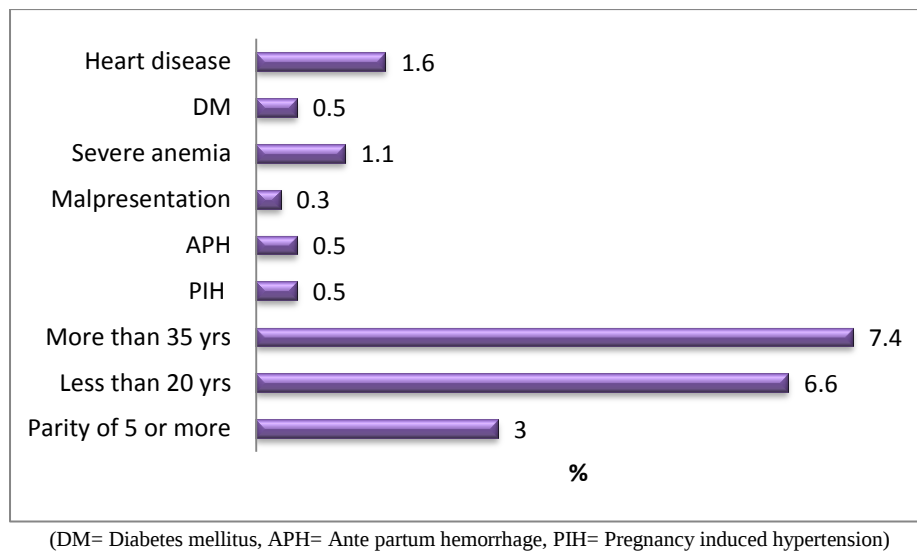
Routinely in field clinics that pregnant women are screened for past obstetric problems and risk factors in present pregnancy. The following graphs shows the percentages of pregnant mothers who were detected to have past obstetric problems and pregnancy complications.

Figure 13 Percentages of pregnant women with past obstetric problems



The reporting of past obstetric problems has been minimal except for abortions (13%) and past sections (6%).

Figure 14 Percentages of pregnant women with current complicated pregnancies



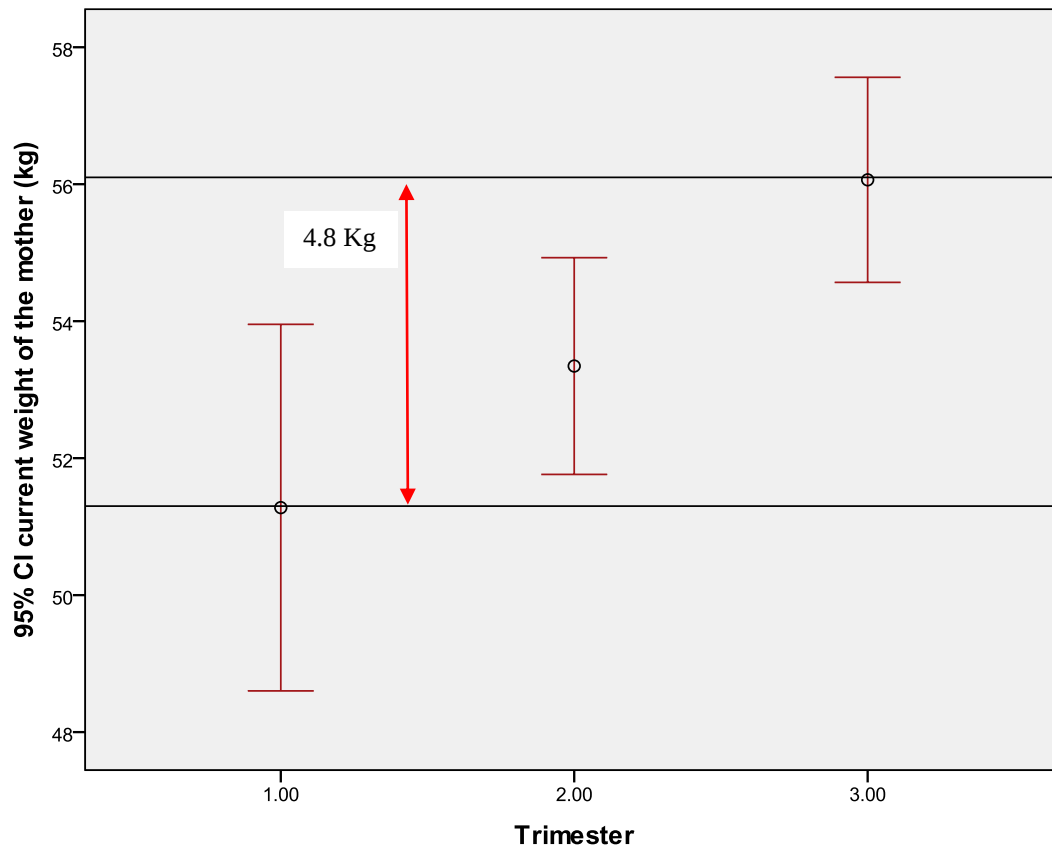
Overall detection of risk factors was low. The commonest risk factor was elderly mothers (7.4%). As the majority of pregnant women examined by medical officers/VOG, it was important to verify whether the

lower reported prevalence of risk factors was due to actually low complications or due to problems of identifying or recording.

6.3 Nutritional status of pregnant mothers

Current weight of pregnant mothers were recorded and the figures were averaged for trimesters. The following figure depicts the pattern of weight distributions error bars representing 2 standard errors of means in kilograms by trimesters.

Figures 15 Weight distributions of pregnant mothers by trimester

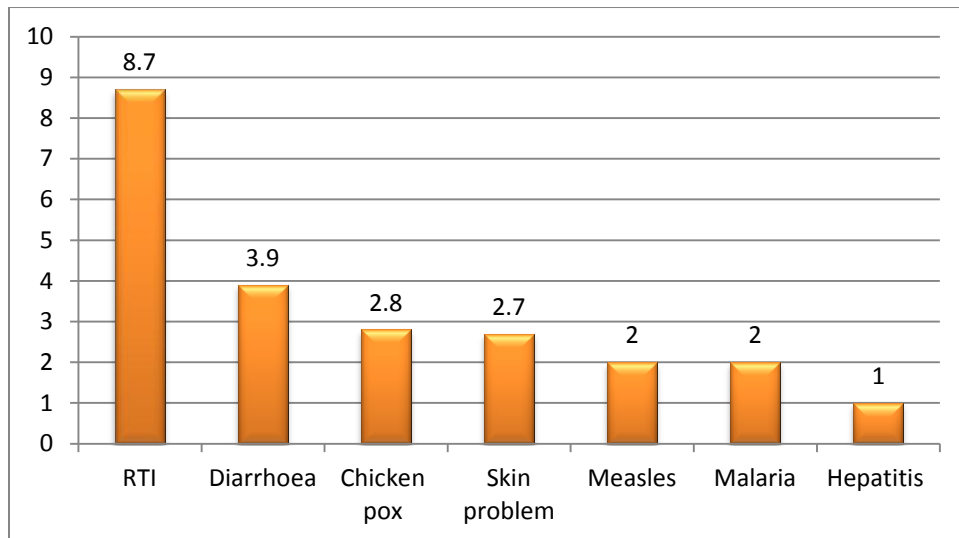


Average weight of pregnant mothers has increased from 51.3 kg in the first trimester to 56.1 kg in the third trimester. Total average weight gain between 1st and 3rd trimester was s 4.8 kg.

6.4 Physical illnesses acquired by pregnant mothers

Pregnant mothers were asked whether they got any of the following illnesses indicated in figure 17 during the month preceding the survey. The information was obtained by posing simple questions to respondents to find out whether they respective illnesses. Special diagnostic verifications had not been carried out.

Figure 16 Percentage of pregnant mothers who had illnesses during the month preceding the survey.

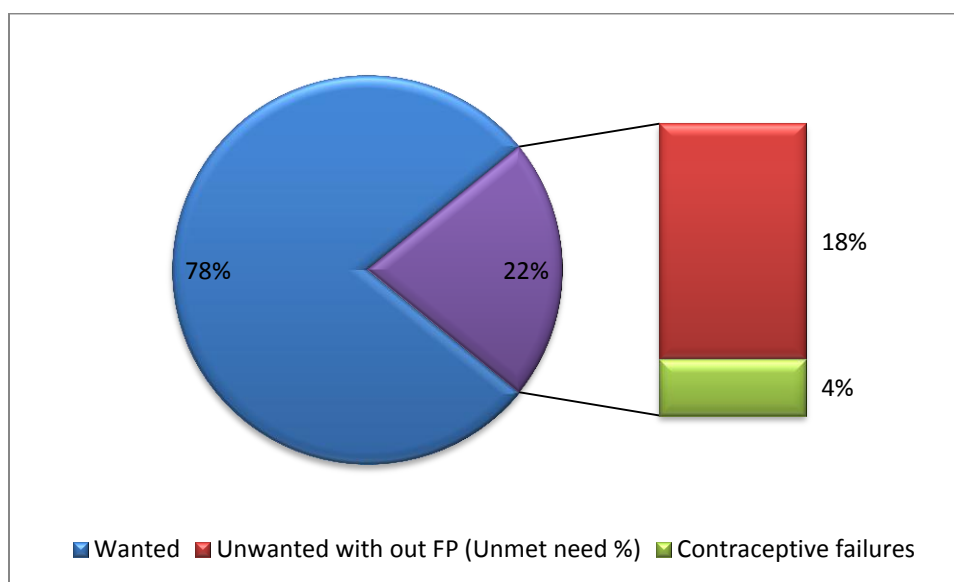


Respiratory tract infections (RTI) has been the most commonly (11%) reported illness. Even though the percentages were low presence of communicable diseases chicken pox, measles, malaria, and hepatitis among pregnant mothers could be an important health concern.

6.5 Contraceptive failures and unmet needs for contraception

Pregnant women were asked whether their pregnancies were planned and wanted. Nearly 78% of mothers were expecting a child when they conceived. Of remaining 22%, 4 % had got pregnant while they were on contraceptives. Others did not want a child and still had not been using any form of contraceptive method resulting in a 18% unmet need for contraception among pregnant women (Figure 17)

Figure 17 Unmet needs for contraception and contraceptive failures



6.6 Exposure to violence and abuse

Study inquired about the experiences pregnant mothers on domestic violence, violence that occurred outside home, and sexual abuse. Nobody reported the experiences of domestic or sexual violence. Only 2.2 % had reported exposure to physical violence outside home. Under reporting could be the likely reason for the low prevalence of exposure to violence and abuse.



7 HEALTH OF THE INFANT: SELECTED INDICATORS AND ASSOCIATED FACTORS

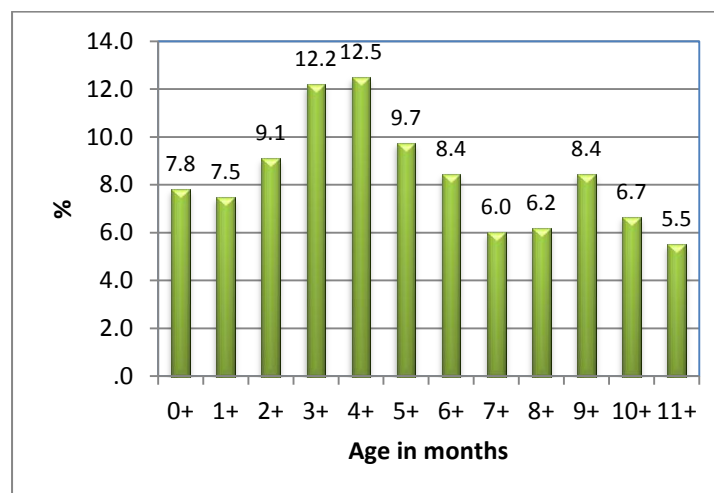
Health related information of the infants in families selected for the study was sought by interviewing their mothers. The sample included 616 infants. If a mother was not present that child was not included in the sample.

7.1 Age and sex of the infants

Out of 616 infants a slightly higher percentage was males (52.6%; CI 46.5-56.5). An interesting pattern surfaced in analysis of ages of the children. Monthly age distribution of infants provided indications of differential rates in conceptions with time among the population studied. There is a relative increase of the number of infants around mid infancy (Figure 18).

The conceptions of these infants would have occurred during the period of March to December 2009. The varying numbers of infants may reflect the varying rates of conceptions by the time period mentioned. Review of the events of said period showed that the August to September period would have been the most peaceful times of the nine months in consideration. The period from March to July would have been very volatile due to the war and evacuation movements. After October resettlement process had started and this may have unsettled the group for the second time. The following graph shows that the number of infants in the sample was at higher levels during the August to September period implying that people may be more inclined to reproduce when they are settled and having the peace of mind.

Figure 18 Distribution of sample of infant by age in months



7.2 Nutritional status

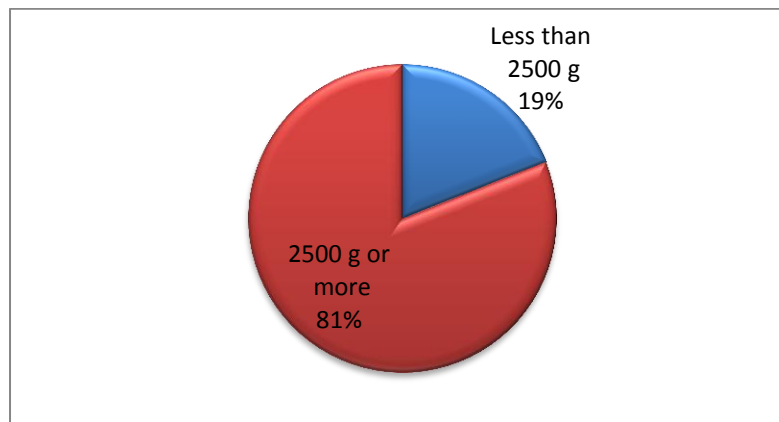
Percentage of children who were born with a weight less than 2500 grams (LBW), percentage of children who were low weight for age and percentage of children with anemia were considered as indicators of nutritional status of infants.

7.2.1 Birth weight

Birth weights were obtained by perusing the child health developmental records (CHDRs). CHDRs were available with 98% of children. Average birth weight of the infants were 2857 (CI: 2820-2894) grams.

The percentage of children who were born with low birth weights (less than 2500 grams) was 19 % (CI: 15.8 - 22.1). Low birth weight is an important risk factor that influences child survival, development and many adulthood illnesses. It is important to note that nearly one fifth of infants of this study population were born with low birth weights.

Figure 19 Percentage of infants with low birth weight



7.2.2 Weight for age

Low weight for age are considered to reflect both acute and chronic malnutrition. All infants were weighed and “z” scores of these weights that corresponded to their ages and sex were determined using WHO standards using WHO Anthro software. The children, whose “z” scores of falling below minus 3 SD cutoffs are considered to be severely underweight. Those with “z” scores between minus 2 and minus 3 are moderately underweight while the children whose “z” scores ranging between minus 1 and minus 2 are considered as at risk for becoming underweight.

Figure 20 Distribution of infants by their weight for age.

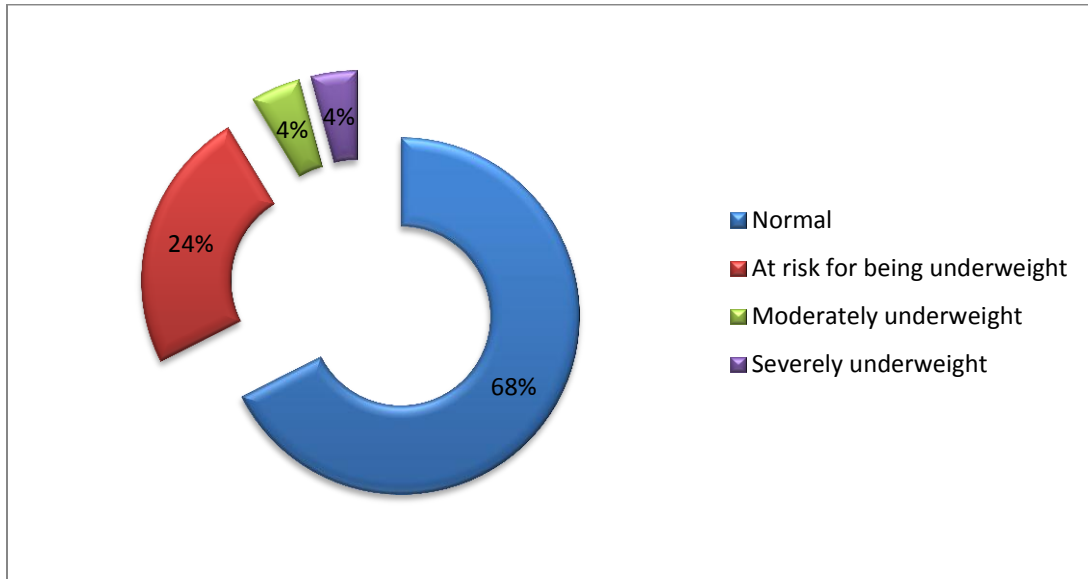
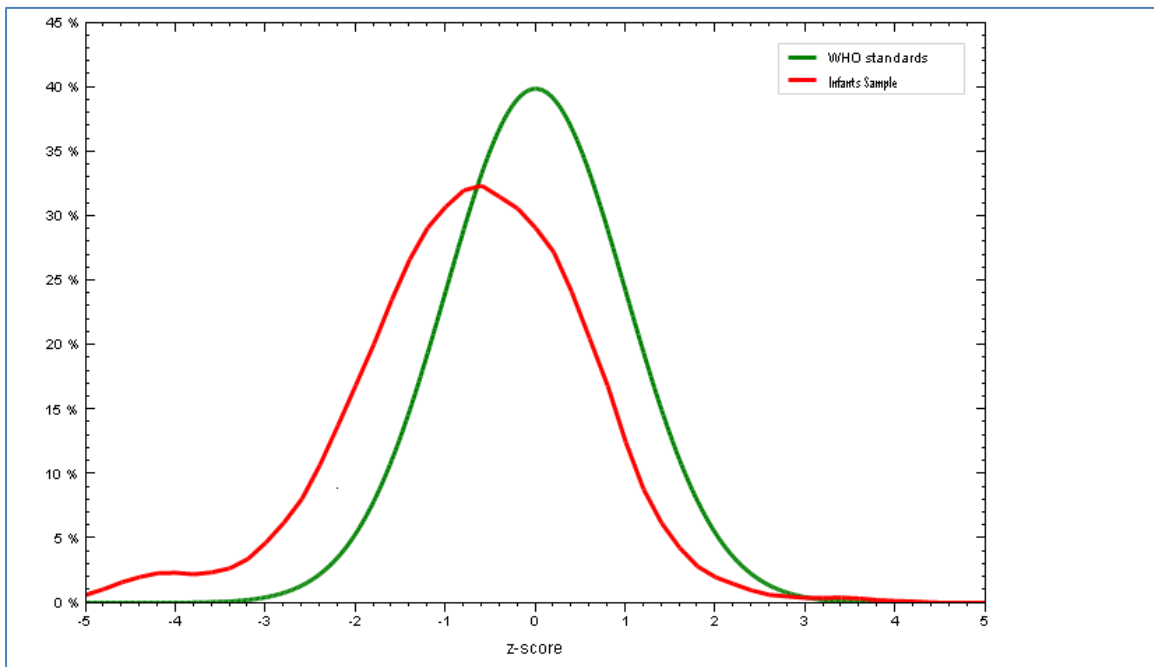


Figure 20 shows that about 4 percent of infants were severely underweight and another 4 % was moderately underweight. Nearly 1/4th of infants were at risk of becoming underweight. The following figure presents the comparison of “z” score distributions of weights of the infant sample with that of WHO standard sample.

Figure 21 Weight for age of the infant sample compared with WHO standards (Z scores)

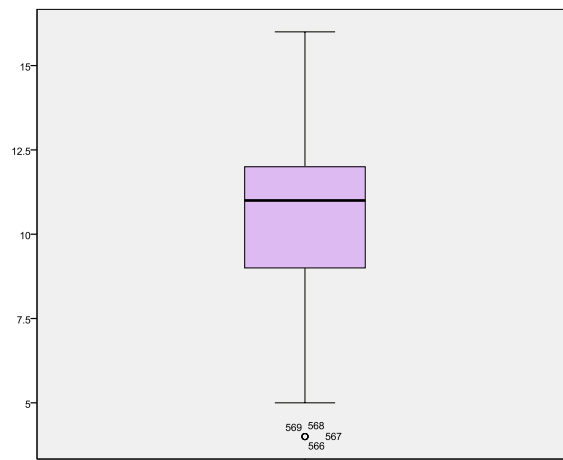


Above graph clearly show that the weights of the infant sample as a whole has been shifted to the left indicating the overall tendency for the infants in the sample to be underweight.

7.2.3 Anemia

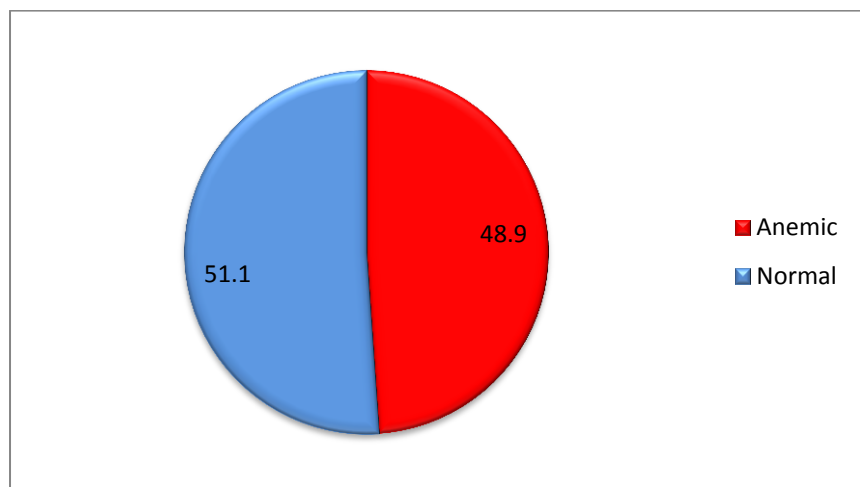
Hemoglobin (Hb) status of infants was assessed using Hemocue test kits. The Hb levels have shown a negatively skewed distribution indicating that among most infants the values were clustered towards the lower end of the spectrum. The mean value of the Hb distribution was 10.5 g/dl while the median Hb value was 11 g/dl.

Figure 22 Distribution of hemoglobin values among infants



Infants having hemoglobin levels less than 11 g/dl is considered to be anemic ⁽⁷⁾. Nearly half, 48.9% (95% CI: 44.0%-52.2%) of infants studied were found to be anemic (Figure 23).

Figure 23 Percentage of anemic infants



7.2.4 Breast feeding

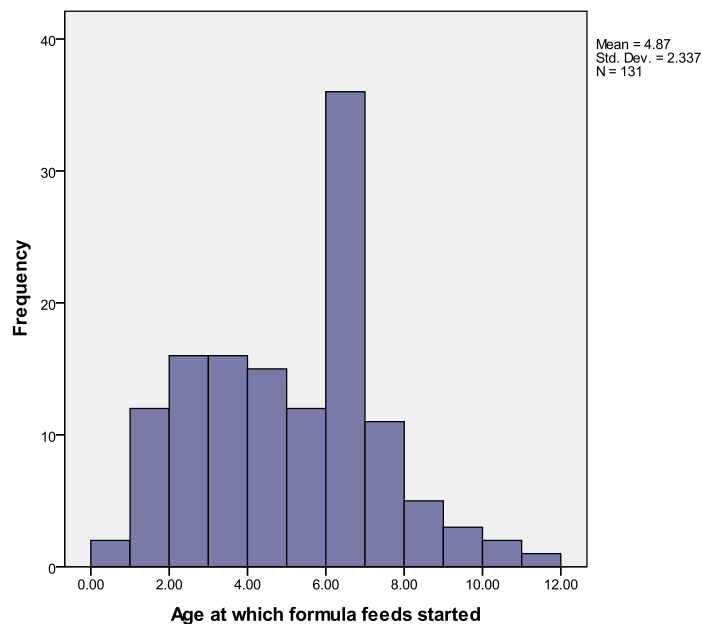
Breast feeding is the healthiest form of nutrition for infants. It is known to promote health, prevent illnesses, improve mother baby bondage and reduces health and feeding costs.

Study showed that 96.9 % (95 % CI: 95.5-98.3) of infants studied were ever breast fed and 93.2 % (95 % CI: 95.5-98.3) has had a period in life during which they have been exclusively breast fed. Approximately 67.6 (95 % CI: 63.5- 71.6) of children have been exclusively breast fed at least for 4 months while 43.0 % (95 % CI: 38.8- 47.3) were breast fed at least 6 months. The average duration of exclusive breast feeding was 3.9 months (95% CI: 3.7-4.1).

7.2.5 Formula feeding

Formula feeding during infancy imposes health risks. It hinders breast feeding and increases water borne illnesses. Formula feeding had been a major concern for health workers during settlement period. There had been an un-controlled supply of formula feeds to welfare villages which were freely distributed among mothers with children. Health authorities had to engage in special health education campaigns to discourage the use of formula feeds. However, the results showed more than one thirds of infants, 33.9% (95% CI: 30.1-37.8) were formula fed and the following figure shows that introduction of formula feed occurred in early months of infancy.

Figure 24 Frequency distribution of infants by the time at which formula feeds were introduced



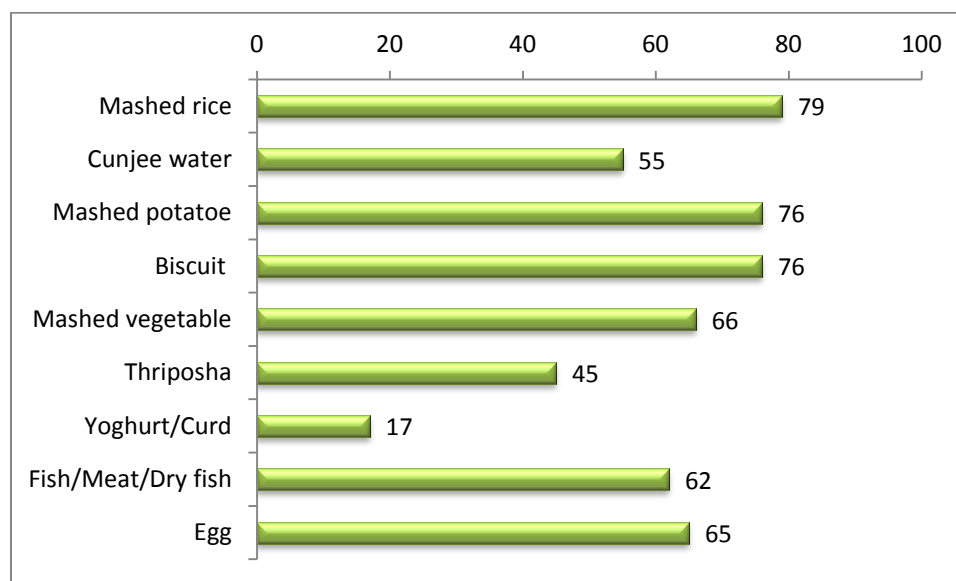
The graph shows in 63% of the cases formula feeding started before 6 months of age. The highest frequency of infants to commence formula feeds was at 6 months.

7.2.6 Complementary feeding

The exclusive breast feeding policy of the country advocates delaying introduction of complementary feeding until 6 months of age. The results indicate that some form of complementary feeding was introduced to 66.3 % (95% CI: 61.6-71.1) of infants around 4 months of age. This percentage had

increased to 90.7% (95%CI: 87.1-94.4) by the age of 6 months. The following graph shows the variety of complementary feeds offered to infants.

Figure 25 Percentages of children, who have been offered different types of complementary feeds

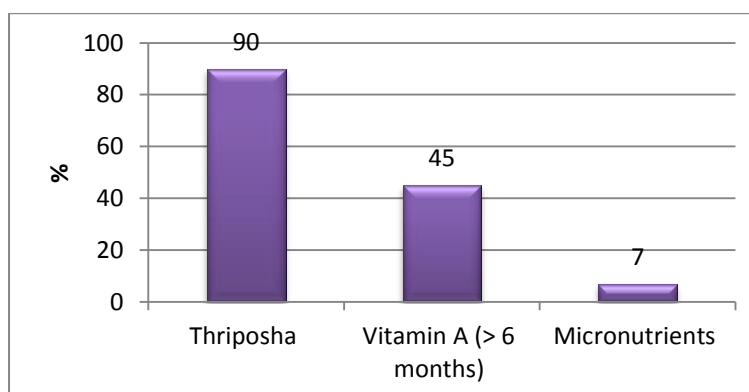


The distribution shows that the introduction of complementary feeds supplying protein was relatively scarce.

7.2.7 Food supplementation

Three types of food supplementations were supposed to be distributed among children and pregnant women. They are Thirposha, Vitamin A, and Micronutrient “sprinkles”. The following graph shows the percentages of infants who received these supplementary foods.

Figure 26 Percentage of infants who received different types of food supplements



Except for Thriposha, the distribution of other nutritional supplements seems to be less satisfactory. Supply of Vitamin A and Micronutrients was considered an important strategy in the prevention of malnutrition and anemia among infants.

7.3 Immunization

The study verified the coverage of infants with vaccines by their ages. For example all infants should have been immunized BCG vaccine while all infants more than 2 months are expected to be immunized with OPV1, DPT1 and Hepatitis B vaccines. The following table shows the coverage of different types of vaccines given by the national program.

Table 1 Coverage of vaccines among infants.

Vaccine	Eligible age group	% Coverage (95% CI%)
BCG	0 to 12 months	98.2 (97.2-99.3)
OPV1	2 or more months	91.4 (89.0-93.8)
DPT1		90.2 (87.7-92.8)
HEPB 1		84.7 (81.6-87.8)
OPV2	4 or more months	83.1 (79.4-86.8)
DPT2		81.1 (77.2-85.0)
HEPB2		77.2 (73.1-81.4)
OPV3	6 or more months	76.0 (70.7-81.3)
DPT3		74.8 (69.4-80.2)
HEPB3		68.9 (63.2-74.6)
MEASLES	9 or more months	49.6 (40.8-58.4)

Vaccine coverage seemed to be reduced with age.

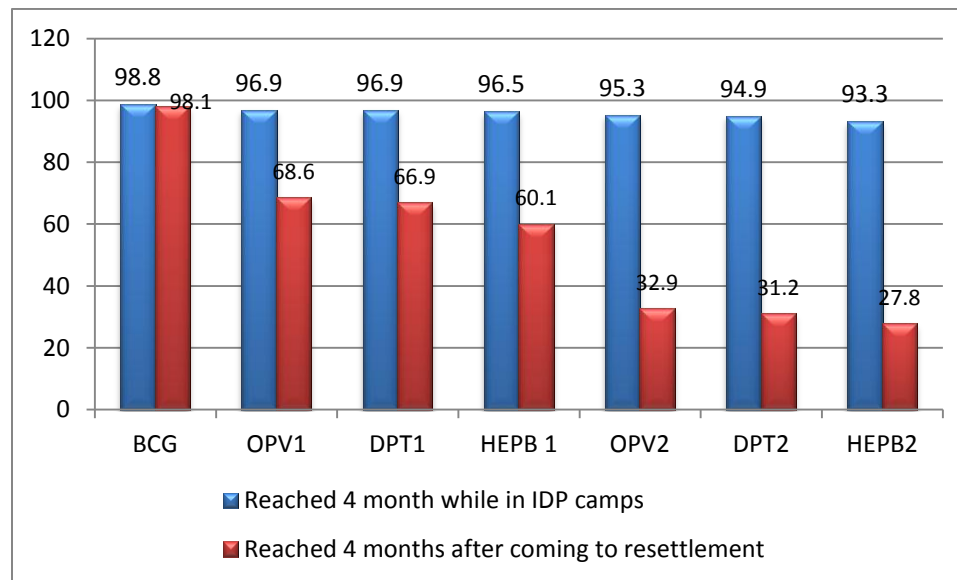
7.3.1 Vaccine coverage while in IDP camps vs vaccine coverage in resettled areas.

The study showed that immunization coverage in newly settled areas was poorer than that of the welfare villages. For instance the infant who reached 4 months of age while they were in IDP camps would have received their BCG,DPT/OPV/HEPB fist and second vaccines while they were still in the welfare

villages. Those who reached 4 months after coming to resettled areas received same vaccines in the new areas of settlement.

The following graph (figure 27) compares the coverage of the these 4 vaccines by the 2 groups.

Figure 27 Comparison of immunization coverage of infants in less than more than 4 months age groups.

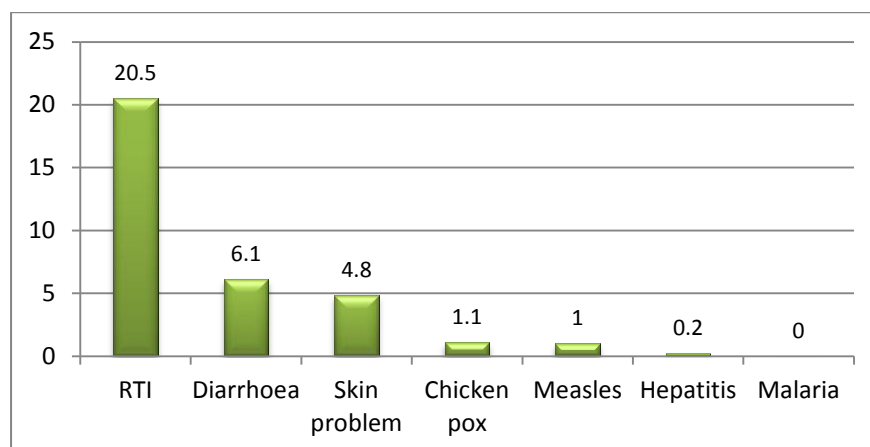


It was clearly shown that when compared to the vaccine coverage in IDP camps, the coverage of vaccines were much lower in resettlement areas.

7.4 Illnesses acquired by infants

Study inquired about histories of infants falling ill during the month preceding the survey. Nearly a 20% of infants were suffering from respiratory tract illnesses (RTI) which was the most common type of illness. Diarrhea was found among only 6 % of infants.

Figure 28 Percentage of infants who has had different types of illnesses during the month preceding the survey





8 HEALTH OF THE CHILD: SELECTED INDICATORS AND ASSOCIATED FACTORS

Children aged 1-14 years of life were included in the sample. One child from a family, was randomly selected. Information on the different aspects of their health was gathered. The mother, or if the mother was not present, the primary care giver of the child provided the information.

8.1 Demographic profile of children

The sample included 2913 children in 1 to 14 year age group and of them 55% (1609) were in the 1- 4 year of age while the rest (1304) were from the 5 – 14 year age group. The sample comprised of more or less equal percentages of males (51%) and females (49%).

8.2 Nutritional status

Birth weight, weight for age and presence of anemia were considered as nutritional indicators of these children. Birth weights were obtained from the CHDRs of children. CHDRs were available for only 2681 (92%) children.

8.2.1 Birth weight

The average birth weight of children from 1- 14 years of age was 2889 (SD 515; 95% CI: 2869-2908) grams. The following table shows the details of the birth weights by different age categories.

Table 2 Comparison of birth weights of 1- 4 year and 5 -14 year age groups.

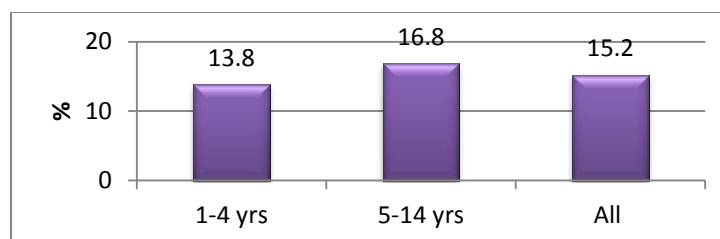
Age category	Mean birth weight in grams (SD)	95% CI of Birth weight
1 -4 years	2916	2892-2940
5 -14 years	2853	2821-2885
All	2889	2869-2908

(p=0.002)

On average the birth weights of older children (5-14 years) were lower than that of younger children (1-4 years).

About 15.2 % (95% CI: 13.8-16.5%) of children were born with low birth weights. Relatively higher percentage of older children (5-14 years) had low birth weights (figure 29).

Figure 29 Comparison of low birth weight percentages among younger and older children

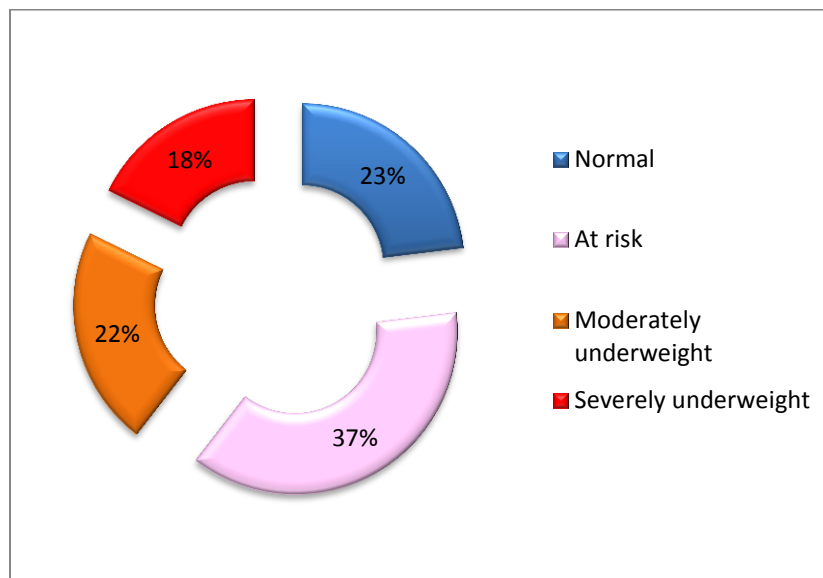


8.2.2 Weight for age

The current weights of children were measured and the values were compared with the WHO standard age sex based “z” scores using the WHO Anthro software. The children, whose “z” scores of falling below minus 3 SD cutoffs are considered to be severely underweight. Those with “z” scores between minus 2 and minus 3 are moderately underweight while the children whose “z” scores ranging between minus 1 and minus 2 are considered as at risk for becoming underweight.

The following pie chart indicates the percentage of children belonging to different categories of nutritional status.

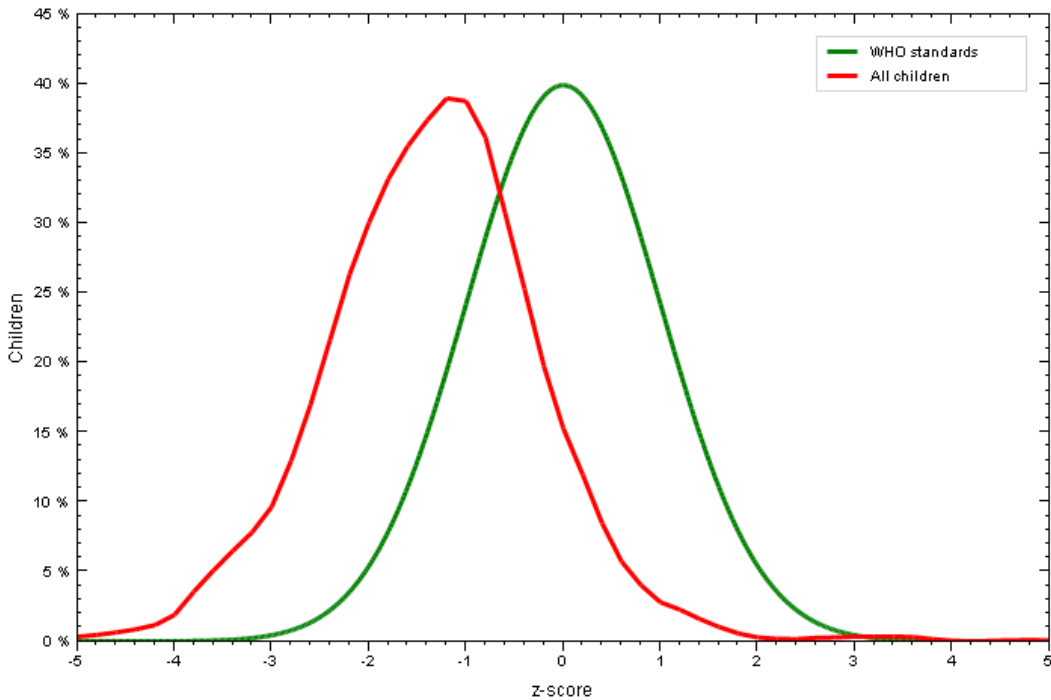
Figure 30 Distribution of children by weight for age.



It is noteworthy that only 23% of children had normal weight for their age. Nearly 40% of the children were having unsatisfactory levels of weights for their ages.

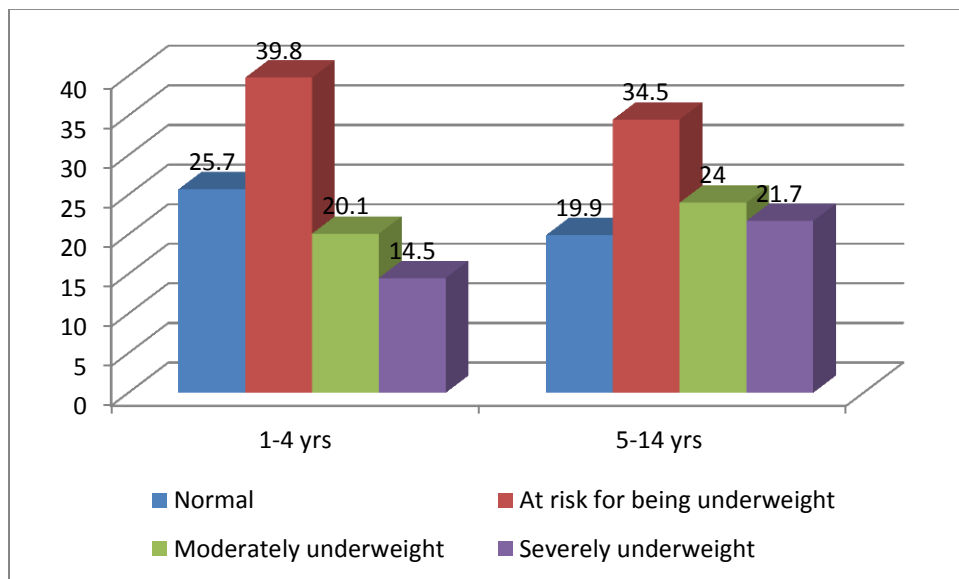
The following comparative histogram also indicates that the weights of the children sample as a whole has been shifted to left indicating the overall tendency for the majority of children to be underweight.

Figure 31 Weight for age children compared with WHO standards (Z scores)



Differences were observed in the percentages of severely and moderately underweight children among younger (1-4 years) and older groups (5-14 years) of children ($P < 0.001$). Figure 33 shows the respective percentages are higher among older children.

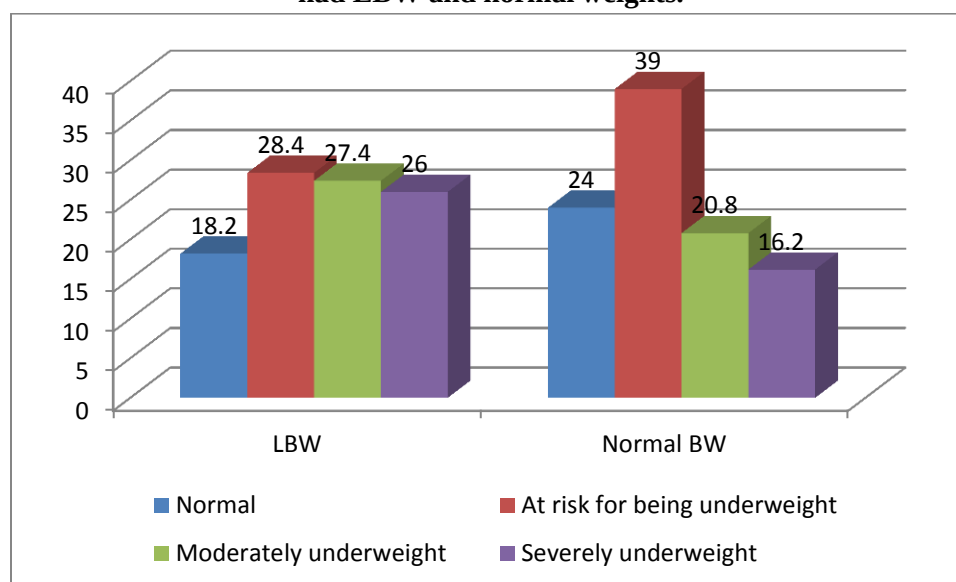
Figure 32 Distribution of different types of weight categories by age groups



($P < 0.05$)

Comparison of the distribution patterns of different weight categories between children who had LBW and those who were born with normal weights indicate that those who had LBW at birth had a higher risk of being underweight for their age.

Figure 33 Distribution of different types of weight categories among children had LBW and normal weights.



($P < 0.001$)

More than half of children (53%) who were born with low birth weights were either moderately (27%) or severely under weight (26%). Only a 37% of children born with normal weights were either moderately (21%) or severely underweight (16%).

8.2.3 Anemia

One to 4 year old children with serum Hb concentration less than 11 g/dl and 5 -14 years old children with serum a serum Hb concentration less than 11.5 g/dl are considered to be anemic ⁽⁷⁾. Analysis of Hb status of children sample indicate 47.2 % (95% CI: 45.3-49.1) children were anemic (Figure 34).

Figure 34 Percentage of children with anemia

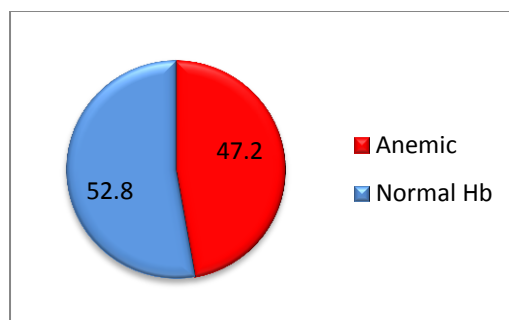
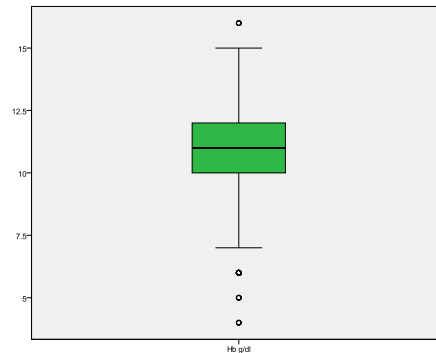


Figure 36 Distribution of Hb level among children aged 1-14 years



8.2.4 Breast feeding

Information on breast and formula feeding practices were sought from the children in 2nd and 3rd years of life (n=409). Approximately 98 % (95% CI: 96.2-99.3) of them were ever breastfed and of the only 91.4% (95% CI: 88.5-94.4) had a period in early life during which they were exclusively breastfed. Approximately 79.5% (95% CI: 75.4-83.2) of the children were exclusively breastfed for a period of 4 months or more. Sixty four percent (95% CI: 59.5- 68.7) were breastfed for 6 or more months.

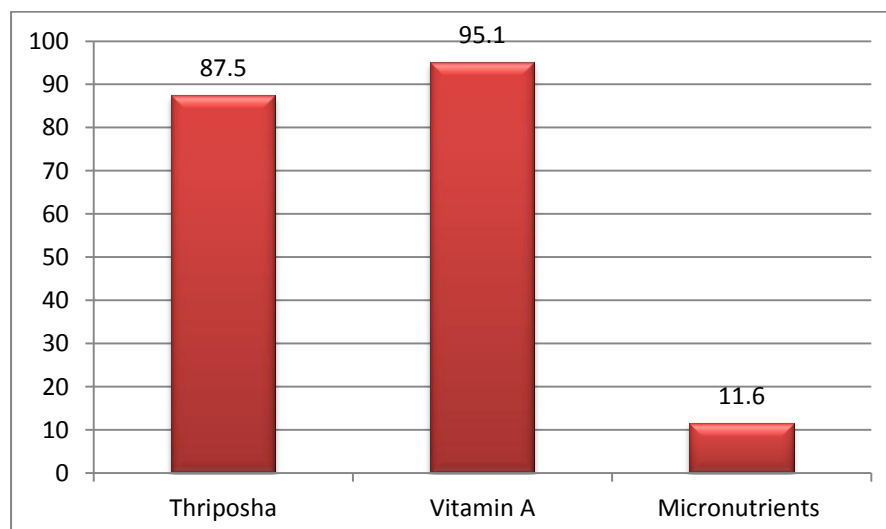
8.2.5 Formula feeding

Formula feeding was practiced by the mothers/ caregivers on 76.9% (95 CI: 72.5-81.3) of children in the 2nd and 3rd years of life.

8.2.6 Food supplementation

The following figure presents the percentages of children who had been supplied with Thriposha, Vitamin A and Multiple micronutrient containing sprinkles.

Figure 37 Percentage of children 1-5 years who received different types of food supplements



Micronutrients supplementation, that was supposed to be in the form of sprinkles containing multiple micronutrients seemed to have not reached the community.

8.3 Immunization

The following table presents the immunization coverage of children under 5 years. Coverage of each vaccine was assessed by determining the percentage of eligible children who were vaccinated with each type of vaccine in the national programme on immunization.

Table 3 Coverage of differ types of vaccines among children in 1-4 year ages

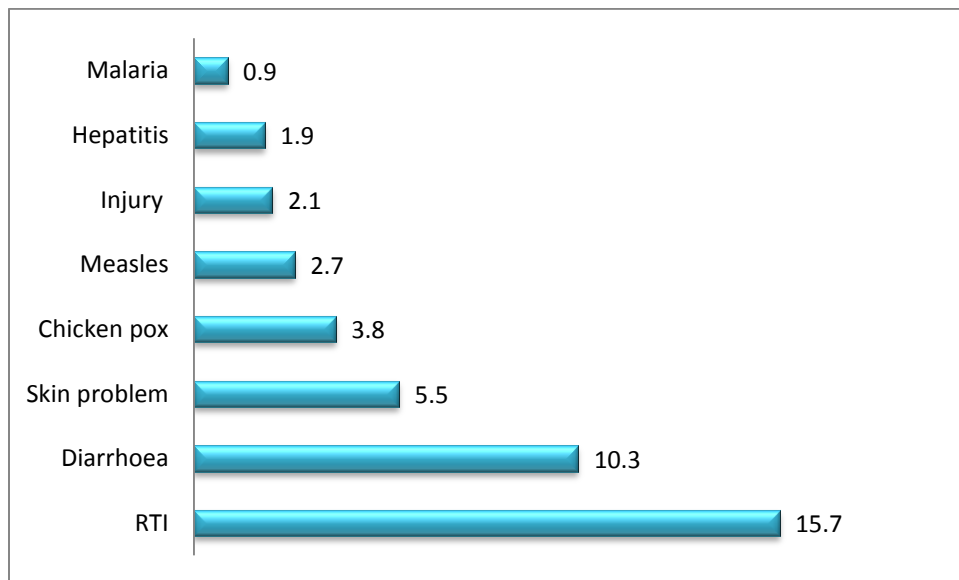
Vaccine	Eligible age group	% Coverage (95% CI%)
BCG	1-4 years	99.9(99.8-100.0)
OPV1	1-4 years	99.5 (99.2-99.8)
DPT1	1-4 years	99.0 (98.6-99.4)
HEB1	1-4 years	84.0 (82.7 (85.4)
OPV2	1-4 years	99.2 (98.8-99.5)
DPT2	1-4 years	98.8 (98.3-99.2)
HEB2	1-4 years	83.8 (82.4-85.2)
OPV3	1-4 years	98.8 (98.4-99.2)
DPT3	1-4 years	98.4 (98.0-98.9)
HEB3	1-4 years	83.9 (82.6-85.3)
MEASLES	1-4 years	97.2 (96.6-97.9)
OPV 4	Over 18 months	92.9 (91.9-93.9)
DPT 4	Over 18 months	91.3 (90.2-92.4)
MR	Over 3 years	90.1 (88.8-91.5)

Overall immunization coverage was satisfactory. The coverage in general seemed to have declined with age. There is also vaccine specific coverage differences where Hepatitis B vaccine having the lowest coverage.

8.4 Illnesses acquired by children in 1- 14 year age group

Respiratory tract infections (RTI) were the most reported type of illness during the month preceding the survey. Nearly 16 % of children had RTIs. One tenth had suffered from diarrhea.

Figure 38 Percentage of children (1-14 years) who had illnesses and injuries during the month preceding the survey



Presence of chicken pox, measles and hepatitis was a notable feature.



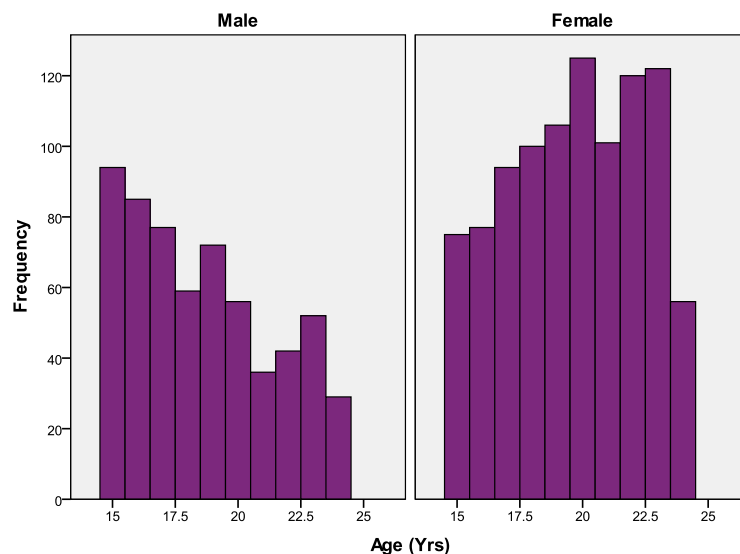
9 HEALTH OF THE YOUTH : SELECTED INDICATORS AND ASSOCIATED FACTORS

About 1603 youth (15 to 24 years) who were members of the families recruited for the study were surveyed for a selected number of health indicators. They were directly interviewed for the information.

9.1 Age, sex and marital status of youth

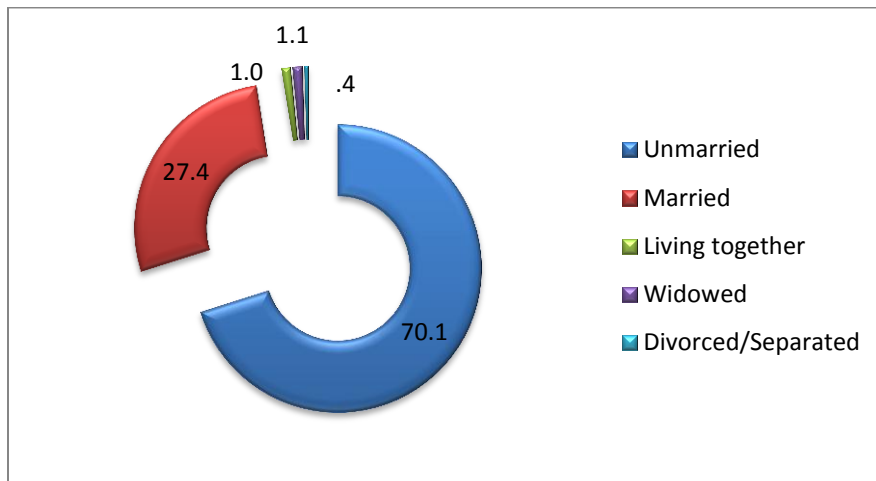
Analysis of age and sex of youth sample is given in the figure 39. The representation of male youth was lower among the higher end of the age.

Figure 39 Distribution of sample of youth by age & sex



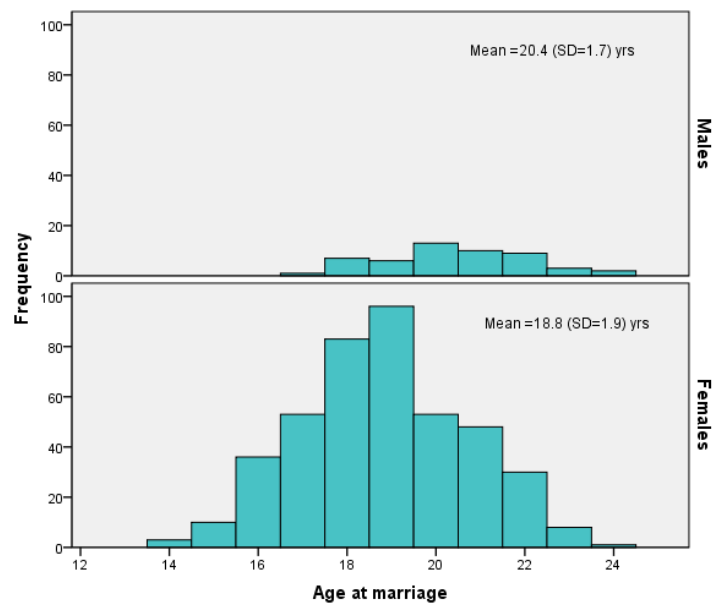
Females were predominant (61.9%) in the sample. Majority of the sample were not married (Figure 40).

Figure 40 Marital status of the youth



On average, the youth who were married, got married at the age of 18.9 (SD=2.4) years. The mean age at marriage for males was 2 years more than that of females (Figure 41).

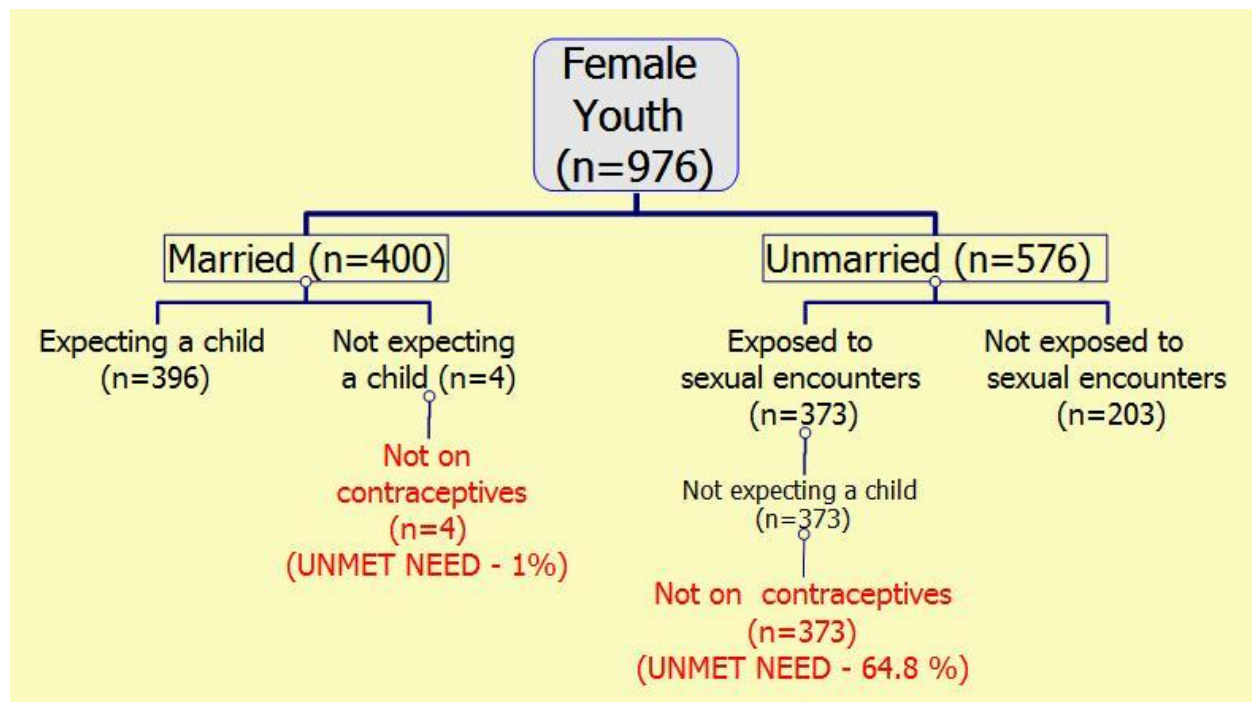
Figure 41 Distribution of ages at marriages by sex among youth



9.2 Unmet need for contraception

Only female youth were analyzed to assess the unmet need for contraception. None of them were pregnant. Figure 42 present the distribution of the sample of female youths by marital status, potential to get an unwanted child and use of contraceptives. Nearly 65% of unmarried female youth had unmet need for contraception. Unmet need for contraception among married youth seemed to be not a major issue (1%), especially because most of them were expecting children (Figure 42).

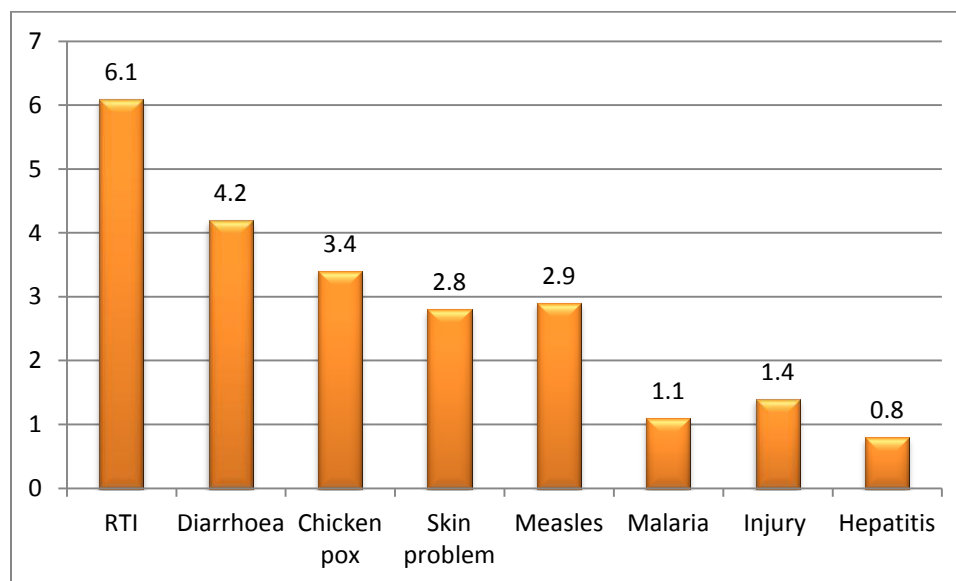
Figure 42 Percentage of unmet need for contraception among female youth



9.3 Illnesses acquired by youth

Respiratory tract infections (RTI) (6%) and diarrhea (4%) were the most common illnesses among youth. Evidence of chicken pox and measles were seen among nearly 3 % of youth.

Figure 43 Percentages of youth who had illnesses during the month preceding the survey.



9.4 Exposure to violence and abuse

Current experiences of youth on domestic violence, physical violence that occurred outside home and sexual abuse was verified. Only 0.9 % of youth had reported being victims of domestic violence while 4.2% and 0.1 % had reported being subjected to physical violence outside home and sexual abuse respectively.



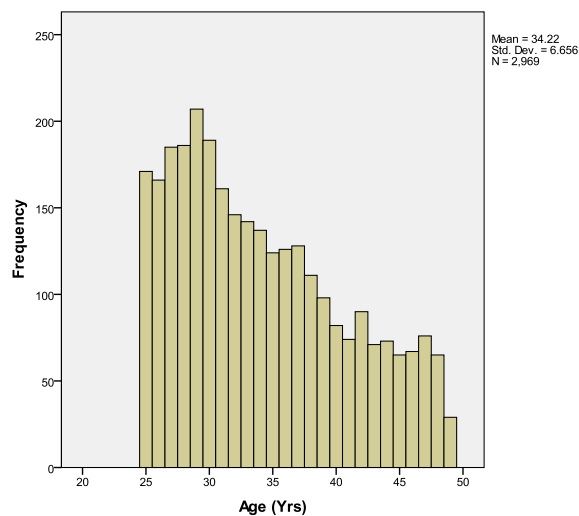
10 HEALTH OF WOMEN: SELECTED INDICATORS AND ASSOCIATED FACTORS

Selected aspect of the health of women who were between 25 and 49 yrs were studied. The sample included 2969 such women and they were directly interviewed for information.

10.1 Age, age at marriage and marital status of women

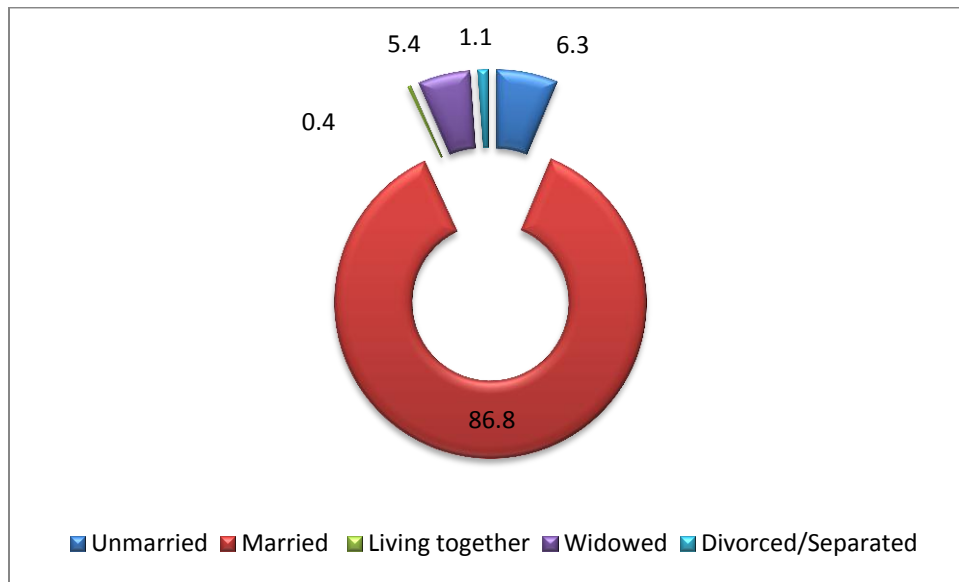
The sample included relatively large number of women near the lower end of the age spectrum studied (25-49 y). The mean age of the sample was 34 (SD=6.7) years(Figure 44).

Figure 44 Distribution of the sample by age of women



Majority of these women were married. Over 5 % were widowed (Figure 45).

Figure 45 Marital status of women

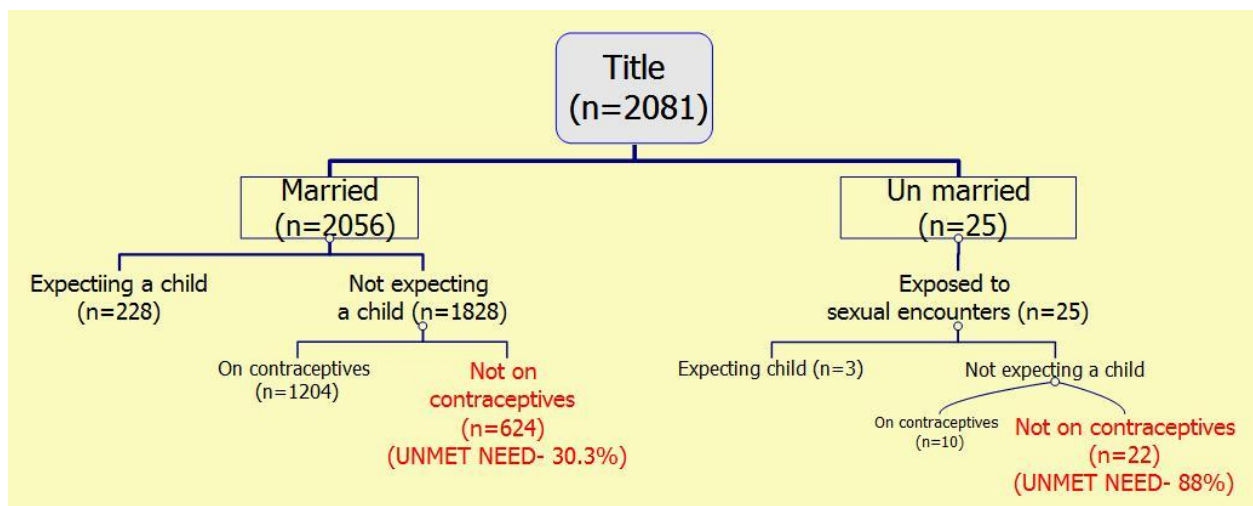


Mean and median ages at marriage of the women were 22.59 (SD= 4.4) and 22 years respectively. About 27.2 % of women got married on or before 19 years of age.

10.2 Unmet need for contraception

Most women were married and unmet need for contraception among them was around 30%. The number of unmarried were limited (n=25) and among them 88% were having unmet need for contraception.

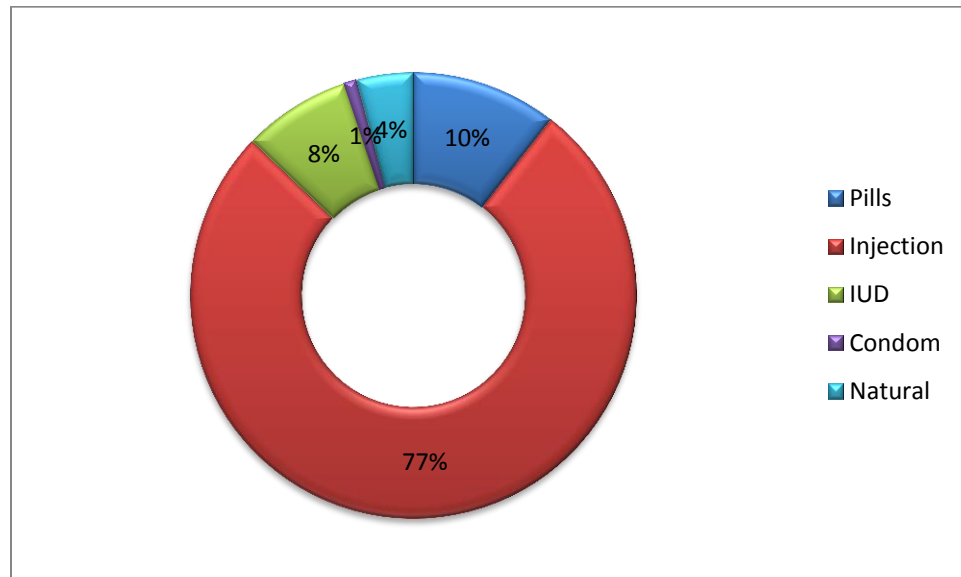
Figure 46 Percentage of unmet need for contraception among



10.3 Types of contraceptives used

The figure 46 presents the percentage of different types of contraceptives used by women.

Figure 46 Percentages of different types of contraceptives



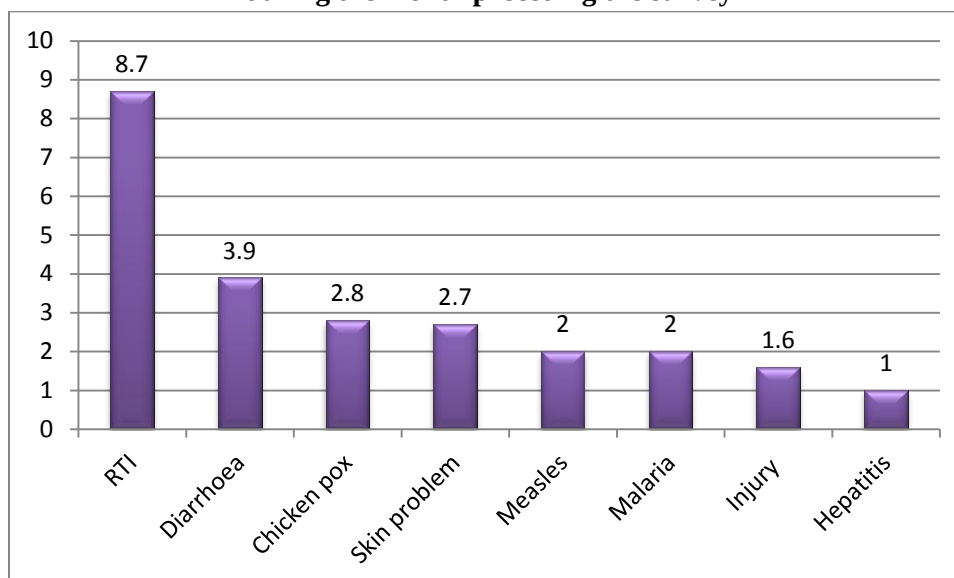
Injections were used by the majority of women (77%). Pills and IUD were used by 10 % and 8 % of women respectively.

10.4 Illnesses acquired by the women

Patterns of illnesses were similar to that experienced by other categories of respondents. The most common illness was respiratory tract illness (RTI) followed by diarrhea, chicken pox and skin problems (Figure 47).

Figure 47 Percentage of women who had different illnesses

during the month preceding the survey



10.5 Exposure to violence and abuse

Current experiences of women on domestic violence, physical violence that occurred outside home and sexual abuse was verified. Only 0.4 % of women had reported being victims of domestic violence while 2.2% and 2 % had reported being subjected to physical violence outside home and sexual abuse respectively.



11 MORTALITY

The mortality rates during the 3 year period, 2007 January to 2009 December, were estimated after analyzing the people included in enumerated households as a retrospective cohort of people experiencing death over the said period. This method has been recommended as a reasonably reliable method of assessing mortalities in humanitarian emergencies such as wars, during which routine reporting systems usually become non existent ⁽⁴⁾. This period represents times during which the war was at its peak for the areas where the majority of study respondents were living. It also encompasses 6 months period of rehabilitation after coming to the camp. So the death rates would reflect the force of mortality during the last two and half years of war and the immediate 6 months during which the humanitarian emergency was settling.

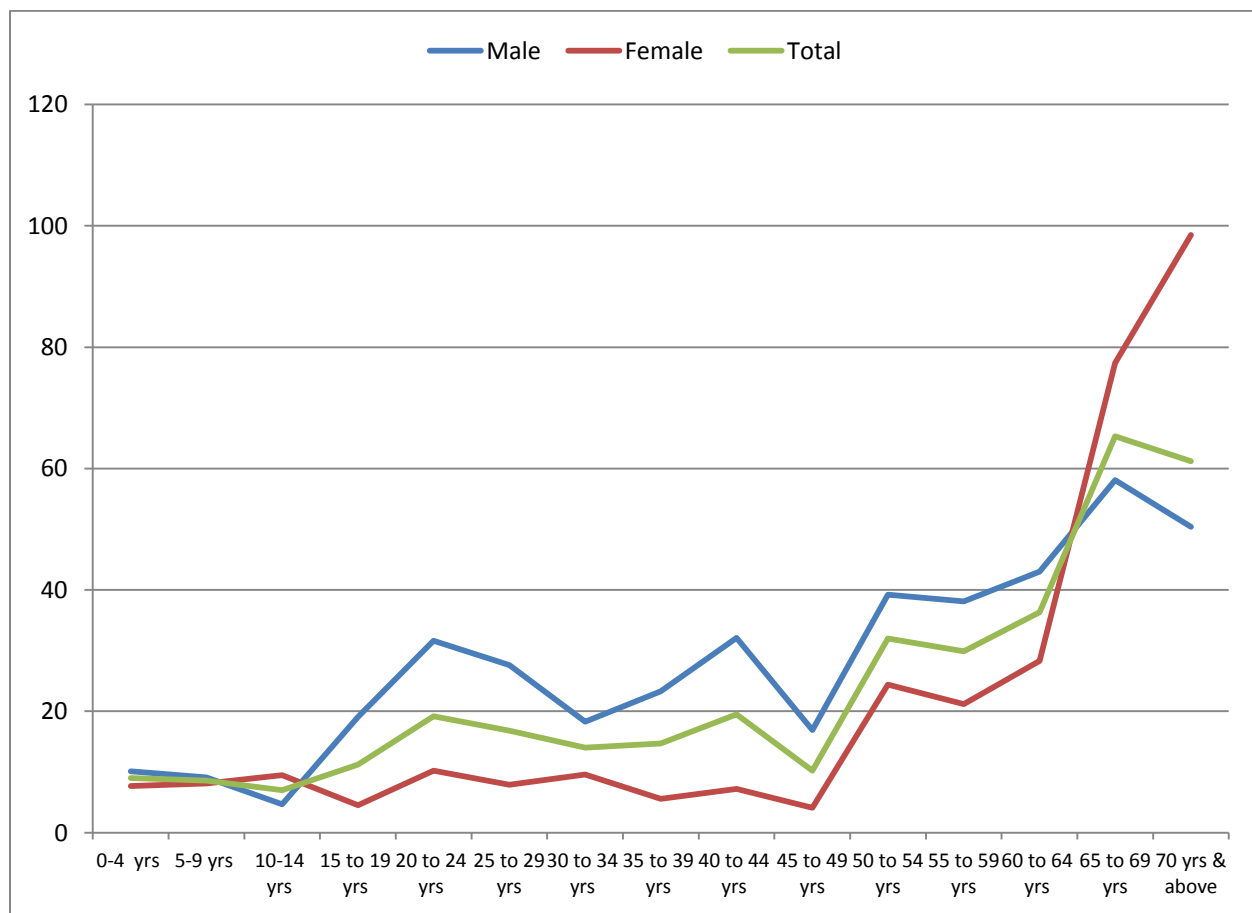
The crude, age specific, and sex specific mortality rates were estimated. A total of 736 deaths were reported from the 4345 families during the period from January 2007 to December 2009 (a period of 36 calendar months). In calculating various death rates, respective numerators were represented by the number of deaths reported for specific age, and sex groups. The denominators were computed by summing up the relevant person years of exposures contributed by: those who lived the entire period, who have been born during the period, and those who have died during the period. The following table indicates the mortality rates.

Table 4 Crude, age and sex specific death rates since the beginning of 2007 to end of the 2009.

Type of mortality rate	Male Rate per 1000 person years of exposure (95% CI)	Female Rate per 1000 person years of exposure (95% CI)	All Rate per 1000 person years of exposure (95% CI)
Crude mortality rate	21.5 (19.6 -23.4)	10.2 (8.9-11.4)	15.7 (14.6-16.9)
Age specific mortality rates			
0-4 years	10.1 (6.9-13.2)	7.7 (4.9-10.7)	9.0 (6.8-11.1)
5-9 years	9.1(5.4-12.5)	8.1 (4.5-11.3)	8.6 (6.1-11.1)
10-14 years	4.7(1.7-7.1)	9.5(5.3-13.6)	7.0 (4.6-9.6)
15 to 19 years	19.1(12.9-24.9)	4.5 (1.9-7.5)	11.2(8.1-14.4)
20 to 24 years	31.6 (24.0-39.4)	10.2 (6.5-14.0)	19.2(15.4-23.1)
25 to 29 years	27.6 (21.5-34.0)	7.9 (5.0-11.1)	16.8 (13.5-20.0)
30 to 34 years	18.3 (13.0-23.7)	9.6 (5.6-13.3)	14.0 (10.7-17.3)
35 to 39 years	23.3 (16.5-30.7)	5.6 (2.2-9.5)	14.7(10.9-19.0)
40 to 44 years	32.1 (21.6-42.1)	7.2 (2.6-12.5)	19.5 (13.9-25.2)

45 to 49 years	16.9 (8.7-25.3)	4.1(0.1-7.6)	10.2 (5.6-14.4)
50 to 54 years	39.2 (24.8-54.8)	24.4 (12.5-36.5)	32.0 (22.6-41.9)
55 to 59 years	38.1(21.2-54.3)	21.2 (9.0-34.9)	29.9 (19.5-40.6)
60 to 64 years	43.0 (20.7-66.3)	28.3(6.9-46.3)	36.3 (20.5-51.3)
65 to 69 years	58.1(24.5-95.1)	77.4(28.1-134.1)	65.3 (35.7-94)
70 years & above	50.4 (32.4-68.5)	98.5 (51.6-145)	61.2 (43.7-78.7)

Figure 48 the Patterns of overall, sex specific death rates by age category.



Overall death rates over 3 year period was found to be near 16/1000 person years of exposure. The sex specific death rates show higher vulnerability of men. The overall relative risk for dying over 3 years for a male was 2.1 times than the risk of women dying during the same period. The death rates for men were shown to be much higher when compared to that of women, during the youth and adulthood probably indicating the impact of war. The differences were most marked from 15 to 45 years. Another pattern observed was the reversal of risk pattern between men and women after the age of 65 years. There has been relative increase of female death rates after the age of 65 years.

12 WAR RELATED INJURIES AND DISABILITIES

Information on the injuries and disabilities occurred during the period of war was sought among the family members studied. The items verified included loss of a limb, loss of function of limb, Injuries to either or both eyes causing visual loss, Injury to ear causing deafness, severe head injuries resulting in functional damage, severe bodily injury and firearm injury. This information was used to calculate respective prevalence rates of disability and injury rates per 1000 people among the study population (Figure 49).

Figure 49 Rate of different types of war related disabilities and injuries per 1000 persons

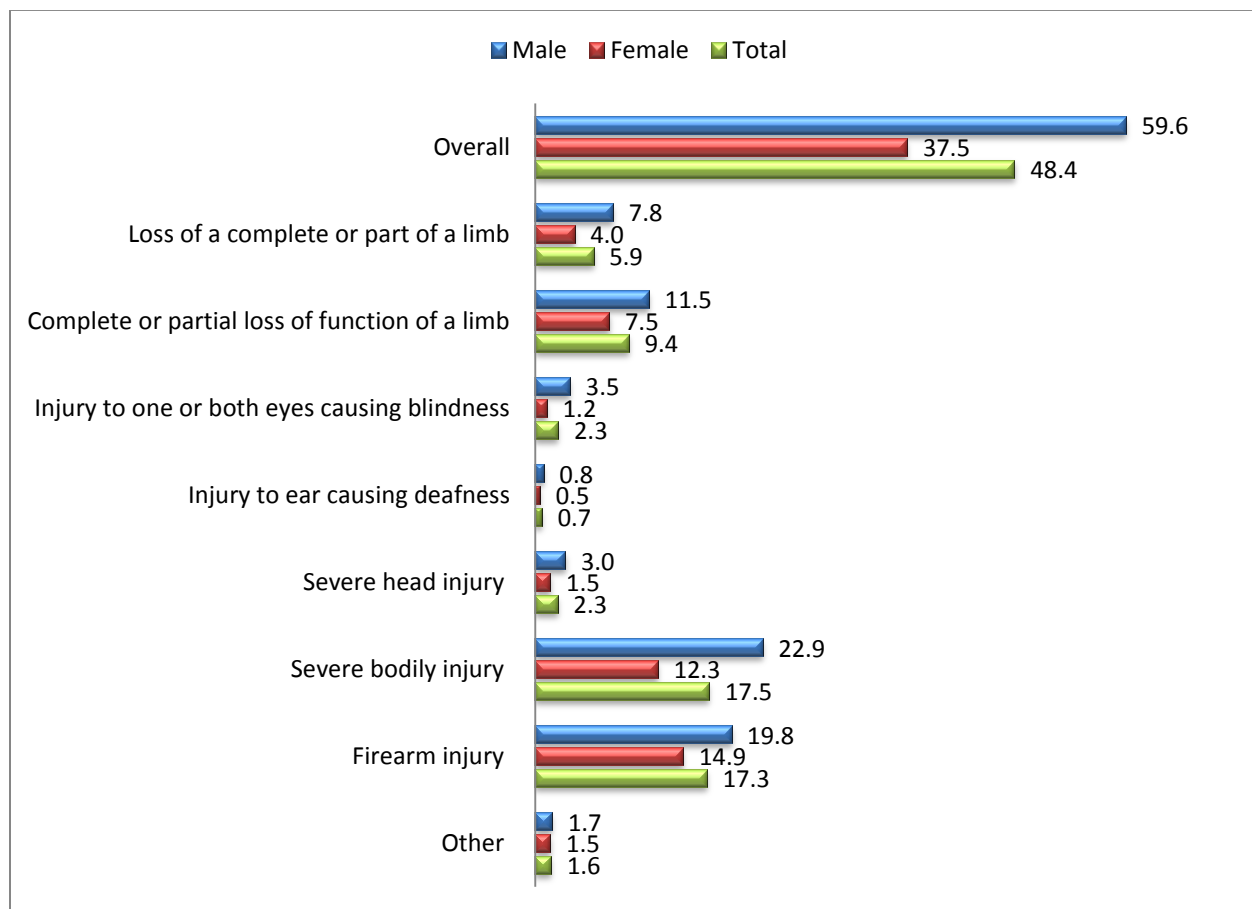


Table 5 Overall and sex specific war related injuries and disabilities

Type of disability or injury	Male	Female	Total
Overall presence of a disability or injury	59.6 (54.3-64.8)	37.5 (33.4-41.6)	48.4 (45.0-51.7)
Loss of a complete or part of a limb	7.8 (5.9-9.7)	4.0 (2.6-5.3)	5.9 (4.7-7.0)
Complete or partial loss of function of a limb without a loss	11.5 (9.2-13.8)	7.5 (5.6-9.3)	9.4 (8.0-10.9)
Injury to one or both eyes causing blindness	3.5 (2.2-4.8)	1.2 (0.4-1.9)	2.3 (1.6-3.0)
Injury to ear causing deafness	0.8 (0.2-1.5)	0.5 (0.0-0.9)	0.7 (0.3-1.0)
Severe head injury resulting in permanent functional damage	3.0 (1.8-4.2)	1.5 (0.7-2.3)	2.3 (1.5-3.0)
Severe bodily injury	22.9 (19.7-26.2)	12.3 (10.0-14.7)	17.5 (15.5-19.5)
Firearm injury	19.8 (16.8-22.8)	14.9 (12.3-17.5)	17.3 (15.3-19.3)
Other	1.7 (0.8-2.6)	1.5 (0.7-2.3)	1.6 (1.0-2.2)

Approximately 48 persons per every 1000 among people exposed to the war were either having a disability or had sustained an injury. The overall prevalence rate for having at least one disability or an injury was 1.6 times higher among males when compared to females. Nearly 20 per every 1000 males had sustained a firearm injury while approximately 15 per every 1000 females did so. Approximately 19 per every 1000 males were disabled due to damages to limbs with or without losing them completely. The corresponding rate for females was around 12 per 1000.



13 CONCLUSIONS AND RECOMMENDATIONS

The survey focused on the health of the people exposed to the last phase of war in the northern region of Sri Lanka. Almost all respondents were from Mulaitivu and Kilinochchi districts. For the most part of the last decade these 2 districts were considered as the strong holds of the LTTE and the war related experiences of people living in these areas could be viewed uniquely in many respects.

Most personnel in these areas could have been LTTE recruits at some point in their lives and hence exposed to the risks of injuries and death. The welfare facilities offered to the people were often limited to that provided through government forces and INGOs such as International Red Cross. LTTE also maintained a form of shadow welfare system that mirrored the government system.

After 2007, once the war escalated to its peak, these areas were completely shut off from the rest of the country. Shortages in food and medical supplies were common and frequent displacement of people from place to place deprived them from the most basic facilities of life. Some were caught in cross fires. During the last few weeks of war in April and May 2009, people were trapped in the war front and hence had endured unimaginable hardships. Subsequently they were evacuated to welfare villages in Cheddiculum, Vavunia within the period of few weeks. The large size of the evacuated population and the severity of health effects had created a formidable humanitarian emergency. However, within a few weeks the government authorities managed to house them in temporary shelters and provide them with essential health care and other basic needs.

This study focus on 2 basic aspects. The first describes the long term impact of war related experiences on the health of this target population. The second describes the current status of health and related services provided to them during the post conflict period.

Nutritional status: According to findings, nutritional rehabilitation of this target population could be viewed as one of the top priority concerns. Nutritional indicators were determined among infants, children and pregnant mothers. A significant percentage (19%) of current infants were born with low birth weight. LBW indicates poor maternal nutrition, gaps in ante-natal care, psychosocial environment during pregnancy and other energy demanding situations peculiar to a war climate.

An alarmingly high percentage of infants and children were found to be with weights inadequate for their ages. Lower weight for age reflects both acute and chronic malnutrition. The percentage of low wt/age increased from 8 % in infancy to nearly 40 % in childhood. Anemia was also found to be quite common. Nearly half of the infants (48.9%) and children (47.2%) were having anemia. This situation could be considered as an important public health concern, given short term and long term impacts of childhood malnutrition and anemia. Average maternal weight gain (4.8 kg) was at a lower level than expected reflecting the problem of malnutrition among this population.

In summary findings concluded the fact that the nutrition of resettling people has been severely compromised. The indicators were based on measurements taken after 2 to 3 months of leaving the welfare villages and hence reflect the current situation in the field. Even though coverage of nutritional interventions such as providing Thriphosha, and Vitamin A were at high levels, it seemed these interventions alone were not adequate to mitigate the malnutrition among children and mothers. However, the nutritional rehabilitation program that was proven to be successful at the welfare villages, where all

children with malnutrition are provided with therapeutic foods following active surveillance, does not seem to be fully operational in new places of resettlement.

Several factors would have contributed and even aggravated the problem of malnutrition among resettling communities. While in welfare villages these people had been a very captive population and interventions such as therapeutic feeding among them were relatively easier to organize. However the resettlement has taken place in larger geographical areas making it difficult to target them for specific interventions. The livelihoods of most of resettling families had been disrupted and it will be sometime before they reclaim their purchasing powers. Cultivation activities are still to commence and thus requiring a major percentage of food supply to come from outside areas. Even though those returning from welfare camps are supposed to be enrolled in local primary health care system for nutritional surveillance and interventions, the sudden influx of population in to the locality would have stretched the capacity of the already scarce human resources available in local health system. This has resulted in imbalances in demand and supply dynamics of routine nutritional surveillance and interventions. On the other hand knowledge and awareness of people in these communities may have been deficient as they had no opportunities to get exposed in nutrition awareness programs carried out in the rest of the country.

Both short term and long term interventions could be recognized as recommendations for nutrition improvement among resettled people.

- *Re-establishment of routine and organized system of active surveillance for malnutrition among children and mothers and providing institutional and /or community based therapeutic and supplementary feeding interventions could be recommended as mandatory requirements to manage the malnutrition among resettling communities. The national guidelines for these activities are already available. One of the main constraints for this would be the inadequate number of PHC workers in the field. Relevant groups of PHC workers are presently being trained by the government and it will be some time until they pass out. Therefore attempts should be made to foster volunteer worker movements to supplement the existing PHC teams. This may involve a substantial training requirement. Joint programming approaches that involve agriculture, irrigation, live stock development, and health sectors will be necessary to ensure sustainable food availability in resettled communities in the long run.*
- *Provision of multiple micronutrients would be considered as another important intervention aimed at preventing anemia among these children.*
- *Implementation of behavior change communication (BCC) programmes to improve the community awareness on nutrition promotion will be necessary. Development of appropriate IEC materials in local languages and training of PHC teams and volunteers on BCC interventions will be required.*
- *Interventions aimed at reestablishment of livelihoods of resettling people will be an important requirement in order to ensure purchasing powers.*

- *Promotion of local food industry will also be main intervention that will have a long term positive impact on malnutrition*

Unmet need of family planning: Survey highlighted varying levels of unmet needs in family planning among youth and women.

- *It is recommended that special emphasis should be paid to strengthen the PHC systems in these areas in providing appropriate family planning counseling and contraceptives to needy women. It may be useful to conduct rapid evaluations of additional service requirements such as trained man power, equipment and clinic facilities. Staff training and BCC interventions may be important consideration. A special program may be required to cater for the needs of the youth.*

Service organization: The findings showed that there was a reduction in the coverage of PHC services after resettlement compared to PHC services received at welfare camps.

- *Carrying out of systematic evaluation of PHC services available to resettling communities is highly recommended. It is important to have a proper audit of service requirements of the resettling people in each MOH areas of the North and East, especially with reference to the new additions in the target populations . Most of these MOH areas were already having service gaps due to resource constraints before the resettling people arrived.*

Injuries and deaths: This survey highlighted a significant percentage of injured people and bereaving families due to loss of loved ones.

- *Therefore it is important to systematically organize disability rehabilitation and mental health interventions that could be channeled through the PHC structure with appropriate referral facilities.*

Population impacts: Population structure showed that the dependency ratios in the study population were relatively higher when compared to national level.

- *Therefore it is important that policy makers should draw the attention to the needs of both young and old sectors of population.*

Limitations: The logistics and resource constraints precluded the assessment of mental health dimensions of the study populations. The objectives were mainly focused on maternal and child health. The method used in data collection was not conducive for assessing the experiences of abuse and violence among youth and women due to stigma and sensitivity attached to these topics.

14 REFERENCES

1. Sri Lankan Civil War. Wikipedia [Internet]. [updated 2010 Dec 03 ; cited 2010 December 04]. Available from: http://en.wikipedia.org/wiki/Sri_Lankan_Civil_War
2. Disaster Response Unit Ministry of Health Sri Lanka. Health Sector response to IDPs in Sri Lanka. Colombo: Ministry of Health Sri Lanka; Forthcoming 2010.
3. The Sphere Project. Humanitarian charter and minimum standards in disaster response. Geneva: The project ;2004.
4. Myatt M, Taylor A. A method for estimating mortality rates in humanitarian emergencies using previous birth history: Annex 4. FANTA project 2006 [Internet]. [cited 2010 Dec 03]. Available from: http://www.fantaproject.org/downloads/pdfs/smartA4_02.pdf
5. Wayne W. Daniel, Biostatistics: a foundation for analysis in the Health Sciences. 5th edition. John Wiley & Sons; 1987. ISBN 0-471-52514-6
6. Bennett S, Woods T, Liyanage WM, Smith DL. A simplified method for cluster sample surveys of health in developing countries. World Health Statistics Quarterly. 1991 ; 44: 98-106.
7. Worldwide Prevalence of Anemia 1993-2005: WHO Global Database on Anemia. WHO [Internet]. [cited 02 Dec 2010]. Available from: http://whqlibdoc.who.int/publications/2008/9789241596657_eng.pdf

