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HOUSEHOLD ILLNESS PREVALENCE AND ITS DETERMINANTS AMONG UNDER FIVE CHILDREN IN GAMBELLA SPECIAL WEREDA, SOUTH WEST ETHIOPIA

BY

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ACRONYMS

AIDS- Acquired Immune Deficiency Syndrome
ANC- Antenatal Care
ARI- Acute Respiratory Infection
BCC- Behavioral change communication
BCG- Bacillus Chalmette Guerin
BMI- Body Mass Index
CBR-Crude Birth Rate
CDR- Crude Death Rate
CMR- Child Mortality Rate
CPR- Contraceptive Prevalence Rate
DHS- Demographic and Health Survey
DPT- Diphtheria Pertussis Tetanus
EPI- Expanded Programme of Immunization
EJHD- Ethiopian Journal of Health Development
FLHW- Female Low Level Health Worker
FP- Family Planning
HA-Health Assistant
HO- Health Officers
HS- Health Station
HSU- Health Service Utilization
IDSR- Integrated District Surveillance and Response
IMCI- Integrated Management of Childhood Illnesses
IMR- Infant Mortality Rate
ITN- Insecticide Treated Bed net
IUCD- Intrauterine Contraceptive Device
LBW- Low Birth Weight
MCH/RH- Mother and Child Health/ Reproductive Health
MDG- Millennium Development Goal
MOH- Ministry of Health
MPH- Master of Public Health
MUAC- Mid upper Arm Circumference
NCHS- National Center for Health Statistics
NID- National Immunization Day
PPS- Probability Proportional to Size
RHB- Regional Health Bureau
RNI- Rate of National Increase
SD- Standard Deviation
SOB- Shortness of breath
TFR- Total Fertility Rate
TT- Tetanus Toxoid
U5MR- Under Five Mortality Rate

ABSTRACT

A community based cross sectional survey was done in Gambella special wereda to determine the household illness prevalence and its determinants among under five children. A total of 831 children were included in the study. The household illness prevalence was 50.6%. The most common types of illnesses were diarrhea (20.5%), malaria (17.8%), cough/shortness of breath (6.7%), fever (6.6%), measles (0.5%) and other illnesses (7.2%).

With regard to malnutrition, the prevalence of stunting was 37.3% wasting, 26.4%, underweight 29.2% and mid upper arm circumference less or equal to 13.5 centimeters was 26.0%.

The factors associated with household illness were area of residence, income, stunting, underweight, time of initiation of breastfeeding, bed net in household, immunization for measles, uvulectomy, milk teeth extraction, and pre lacteal feeding ($p<0.05$).

Majority (80.1 %) of mothers' breast feed their child for more than 6 months and 63.4% breast feed for more than 12 months. Overall, 83.8 % of households owned bed net and about 73.9% of households had insecticide treated bed net less than six months ago.

About 17.0% of households get safe and continuous water supply for drinking (20.7% urban vs.7.3% rural). With regard to excreta disposal system 38.1% of households have access to excreta disposal (52.2% urban and 4.1% of rural). About 63.0% of households use open field (47.8% of urban households and 95.5% of rural households).

With regard to immunization, 64.8% of children were immunized for BCG, 64.8% for polio, 60.1% for DPT, and 50.1% for measles. About 68.4% of mothers had ever followed ANC during the recent pregnancy. More urban women followed ANC than rural (81.8% urban vs.36.5% rural) delivery service 45.6% (57.6% urban vs.16.9% rural), current family planning method use 28.2% (36.1% urban vs. 8.8% rural). About 12.9% of children had uvulectomy, 35.6% had milk teeth extraction, and 44.0% were given prelacteal feeding.

This study showed that household illness and malnutrition were common health problems in Gambella special wereda with their peculiarities from other regions. Based on the findings of the study, development of region specific guidelines within the framework of national guideline on the management of childhood illnesses and malnutrition which are common in the area with subsequent training of health workers at all levels, household intervention programs targeting the frequently

seen illnesses, malnutrition and risk factors to reduce burden of illness and death in the under five children is recommended.

1. INTRODUCTION

1.1 Overview of the study area and health indicators

Gambela Peoples Regional State is one of the 9 national regional states of Ethiopia located in the west. It is bounded by three regions, namely Oromia, Southern Nations, Nationalities and peoples Region (SNNPR), Benishangul Gumuz and The Sudan. It has an area of about 25,000km^2. The main town Gambela is 777 kms away from Addis Ababa.

The region has three climatic zones namely, kola places with an elevation below 1500metres above sea level cover majority of the region, Woina Dega climatic zone, place between 1500 & 2500 meters above sea level, and Dega climatic zone with elevation of above 2500m above sea level .All Wereda have Kolla climatic zone but Dima (Weina Dega) and Godere (Dega).The region has a population of 240,394 with 18.0% living in urban areas. Women of reproductive age group (15-49) account 26.8% of the population and 14.9% of the population are children of less than 5 years of age (1).

The region has one hospital with 96 beds, 8 health centers, 35 health stations and 22 health posts. There are 2 drug shops and 13 rural drug vendors (1).The potential health service coverage of the region for Health center, Health stations, Health post and private clinics is 200%. Expenditure per capita is 49.9Birr / Person & visit per capita is 0.5 (1). The health service utilization in Gambela is the lowest of all regions, which is 0.1 visits per person per year (2)

The antenatal service coverage, attended delivery, and family planning coverage are 19.8%, 12.3% and 5.2% respectively. With regard to immunization, coverage for BCG, DPT3, and measles are 40.3%, 22.4% and 16.5% respectively. In 1996 E.C. the nutritional status of children showed that 37%, 18.1% and 39% to be stunted, wasted and underweight respectively. During the same year, access to safe water and excreta disposal for Gambella region was 29.1% and 6.6% respectively (3). There is no report

of Ministry of Health on nutritional status of children, access to safe water an access to excreta disposal for 1997 E.C.(1)

The currently available information on child health and service utilizations in the region has limitations in that they underestimate the health problems because of low health service utilization for various reasons (2). The limited information from health facilities show that malaria, respiratory infections, diarrhea and measles to be common illnesses for out patient visits among children (1)

1.2 Significance of the study

Information on the morbidity patterns of important childhood illnesses and associated risk factors essential for proper planning and effective implementation of child health intervention programmers (4). Health services should always be directed towards the health needs of the population and this need depends on the diseases pattern, which is always different from one region to another. In a community based national survey in Ethiopian, 38.2% of children (6-59 months) had some type of illness. But there exists differences in the type of illness in different areas. There fore the health need survey should be done in each region (5).

This research is intended based on the fact that currently there is no community based survey on child illness patterns and risk factor in the region. The result of survey at community level will be used as a baseline study, for proper planning, intervention and evaluation of programs.

This study is crucial in assessing the heath of child population and complements data, which are available from mortality or measures of diseases reported from health institutions. Besides addressing the acute problems of children it has the advantage of enrolling those problems that do not reach hospital, which may be over looked as trivial by parents.

In an era where integrated management of childhood illnesses (IMCI) is advocated rather than disease specific vertical programmes, regional data are also required in

order to adapt national guideline on IMCI and nutrition to region specific guidelines within the local context. This research is expected to show the actual childhood prevalence of illness in the urban and rural community, updates the DHS 2000 study results for the region, and gives information on socioeconomic status at household level, use of bed net, feeding practices, immunization (EPI), mother and child health/reproductive health (MCH/RH), education and health related traditional practices in the community. At national level, it gives an information input for regional status of national major health sector development targets (HSDP-III).

2. LITERATURE REVIEW

2.1. The occurrence of childhood illness and death

\More than 10 million children die each year most from preventable causes and almost all in poor counties. The causes of death differ substantially from one country to another highlighting the need to expand understanding of child health epidemiology at a country level rather than geopolitical regions (6)

Planning of sound child health programs requires relevant data at the sub national level (state, or province, district etc) to assess local epidemiological profiles, health system capacity and community preference (7).

More than 10,000 newborn babies die every day, mostly from preventable causes. The millennium Development goal for child survival (MDG-4) to reduce child mortality by two thirds between 1990 and 2015- will not be met without substantial reductions in neonatal mortally (8). Analysis of results from countries in 44 demographic and health survey (DHS) showed that in populations with highest child mortality rates, just over 20% of all child death occurred in the neonatal period (6). Eight million children are either stillborn or die each year within the first month of life. Estimates for 2000, show that 38% of all deaths in children younger than 5 years happen in the first month of life. Ten countries account for two thirds of neonatal deaths however; the countries with the highest rates of neonatal mortality are mostly

in Sub-Sahara Africa. The average daily mortality rate during the neonatal period is close to 30 fold higher than during the post neonatal period (8).

The causes of deaths among under fives in 42 countries are diarrhea, pneumonia, malaria, measles, AIDS, neonatal causes, unspecified causes, and other causes accounting for 22%, 21%, 9%, 1%, 3%, 33%, 9% and 1% respectively. The estimated distribution of causes of death for Sub-Sahara Africa indicates neonatal disorder accounting for 25%, malaria 22%, pneumonia 21%, diarrhea 20% and AIDS 8% (6).

In Ethiopia the under 5 mortality per 1000 live births is 174 and stands sixth by rank of absolute number of child deaths which is 472,000 per year (2).The national child mortality rate is 84.5 per 1000 child and under 5 mortality is 140.1 per 1000 live births. The causes of death for infants in 2004/5 were all types of malaria, bronchopneumonia, gastroenteritis and colitis, tuberculosis, and dysentery (top five leading causes of death) accounting for 28.10%, 24.08%, 8.23%, 5.82% and 2.26% of all deaths respectively(1).

At national level, all types of malaria,, primary a typical pneumonia and unspecified pneumonia, acute upper respiratory infections, helminthes, gastro enteritis and colitis, and tuberculosis, are the first six causes of out patient visits for infants in 1997 E.C.(1)

A cross sectional community based household illness prevalence study among 457 under five children in North West Ethiopia showed that 33.7% had symptoms of illness two weeks prior to the study day (5).

2.2. Malaria among children

Malaria is one of the leading causes of illness and death in many African countries. There are 900,000 deaths per year in Africa mainly children less than 5 years of age and pregnant women (9). Malaria specific deaths in hospital may indicate the trend in mortality although very inaccurate to represent the real situation of an area (10). The mortality rate among children admitted to Gambella hospital with a diagnosis of malaria was 22%. Gambella is one of the areas of Ethiopia with high malarial

endemic. Hospital records indicate that in 1988, 20% of outpatient morbidity and 26% of deaths is the region was due to malaria (11). In 1997 E.C. reported laboratory confirmed malaria cases from Gambella region was 33 per 1000 population (1)

Among 22 Sub-Saharan African countries with endemic malaria, results of surveys between 1999 and 2001 showed that a median of less than 2% of children slept under an insecticide treated bed nets (ITNS) the previous night (7). Fewer than 5% of children in regions of Africa with very high prevalence of malaria are using insecticide treated materials to prevent malaria (12). In hospital based study most of the children (74.8%) admitted to Gambella Hospital for severe malaria did not use bed nets (11).

2.3. Diarrhoeal diseases among children

Diarrhea diseases represent the second leading cause of death among children under 5 years of age in many Africa countries with more than 3 million deaths per year (9). High prevalence of acute watery and diarrhea are responsible for high rates of morbidity among under 5 children. These are at the upper strata of the top ten child hood diseases in Ethiopia (13). In Ethiopia acute diarrhea is more common is lowlands, a child may have 5-6 episodes of acute child hood diarrhea per year (14). Bloody diarrhea has been ranked among the ten top causes of morbidities in under 5 children in Ethiopia (10).

2.4. Acute respiratory infections (ARI) and pneumonia among children

ARI's and pneumonia represent the number one cause of mortality among children under 5 year of age (9). In a cohort study done in Butajira on 1315 children less than 5 years of age, the overall illness of under 5 children was 5.8% of all 11216 person-year. In the same study, ARI and acute diarrhea were the commonest conditions. ARI was responsible for 48% of under five children illness load and 5.7% of all ARI were acute lower respiratory tract infections (15).

2.5. Measles and its complications

WHO estimates that measles still cause, 45 million cases and 1 million child death of which are 50% are in sub Saharan Africa more than half of the global child death from measles occur in Africa (6). Measles is widely known in Ethiopia, and it has many names in the ethnic languages. Mothers usually do not seek medical care for their children who have measles unless they develop complications. For these cases, the primary diagnosis recorded by health worker is not measles but its complications like pneumonia, otitis media, diarrhea, or croup (16). In 1997 E.C. Gambella had the highest number of reported measles cases to the Ministry of Health (MOH), which was 271 (1)

2.6. Some factors associated with childhood illness

2.6.1 Socioeconomic factors

Caregivers' age is significantly associated practice, attitude, and beliefs towards ARI. Caregivers' economic status is also significantly associated with their practice, attitude, and knowledge whereas caregivers' education affected significantly their attitude, knowledge, and beliefs (17). The break down of national household survey data by socioeconomic status has contributed greatly to our understanding of why poor children are less likely to survive than their better off peers. By contrast with children born to better off families, poor children are more exposed to risks for disease through inadequate water and sanitation, indoor air pollution, crowding poor housing conditions, and high exposure to disease vectors. They are also more likely to have lower resistance to infections disease because they are undernourished (an underlying cause for 50% of deaths in children younger than 5 years, to have diets deficient in micronutrients, to have low birth weight (LBW)as a result of maternal nutrition, infections during pregnancy, and short birth intervals and to have recurrent disease (18). In Ethiopia, a quarter of pregnant women in the highest income group use skilled care at delivery, compared to 1% of the poorest (19).

2.6.2. Age at first marriage, fertility, contraceptive use and infant breast feeding

Age at first marriage has significant bearing on the number of children even born alive. Mothers with an earlier age at first birth are likely to end up in having many children. Child hood mortality is by far stands as a powerful predictor of fertility (20). Birth spacing is important risk factors for child mortality (6). In 1997 E.C. contraceptive coverage in Gambella by the type of contraceptive was, pills 34.9%, Depo-Provera 38.4%, and Condoms 26.8%(1). In areas where the use of contraception is significantly higher like Senegal, Bangladesh, Egypt, Zimbabwe the fertility declining effect of contraception is significant (20).

Infants aged 0-5 months who are not breast feed have seven fold and five fold increased risk of death from diarrhea or pneumonia 6-11 months old infants who are not breast fed also have an increased risk of such deaths (6). Breast-feeding is almost universal and prolonged in Ethiopia. Available evidence indicates that close to 97% every 100 Ethiopian children are ever breast fed, and slightly over 25% of children are still being fed at 2 years of age (13). In a study of differentials of fertility Butajira the duration of breast-feeding showed significant difference between the two fertility profiles in the last but one child. Those mothers with prolonged breast-feeding showed a lower fertility (20).

2.6.3. Childhood immunization

Full series immunization by one year of age in Ethiopia is low reflecting the current pattern of child mortality (2). The regional status of immunization coverage revealed that BCG 40.3%, DPT3 22.4%, measles 16.5% and fully immunized 13.2%.The regional drop out rate was BCG-measles 57.6%, BCG-DPT3 42.5%, DPT1- DPT3 16.6% and DPT1-measles was 77.6% (1).

2.6.4. Infant / child feeding practices

Malnutrition, particularly in combination with ARI, diarrhea, malaria or measles is important cause of morbidity in children. It is closely linked to inappropriate feeding practices and food insecurity in many parts of Ethiopia (2). Key issues in childhood morbidity and mortality include the importance of under nutrition as an underling

cause of child death associated with infectious disease. An analysis of ten longitudinal community based studies of children less than 5 years showed that being under weight conferred additional risks of mortality from infections diseases. The fraction of disease attributable to being underweight was 61% for diarrhea, 57% for malaria, 53% for pneumonia, 45% for measles and 53% for other infectious disease (6).

Relative risks for mortality in children under 5 derived from the ten studies assessed have been used to estimate that 53% of child deaths could be attributed to being underweight. Of these 35% of all child deaths are due to the effect of underweight status on diarrhea, pneumonia, measles and malaria and relative risks of low maternal body mass index(BMI) for fetal growth retardation and its risks for selected neonatal causes of deaths (4)

The national nutritional status of children showed that 48.5% of rural and 29.5% of urban children are stunted, 8.4% of rural and 6.5%of urban children wasted and 38.7% of rural and 20.8% of urban children are underweight (1).

The dietary intake of young children is given less attention in our community in general. In the rural areas children are usually exclusively breast-fed beyond the recommended age of six months and introduction of complementary food in delayed. The duration of exclusive breast feeding in some are as such as Tigray and North Gondar is as long as 12 months (13).

An interaction of two health disorders can have a synergistic effect on mortality. This has been clearly documented for the relation between being underweight and infectious disease (4).

2.6.5. Environmental factors

Unhygienic and unsafe environments contributed about 1.5 million child deaths and around 88% of deaths from diarrhea (6). Improved water supply and sanitation reduced the incidence of diarrhea among young children by 20.27% (21). More

commonly however two diseases occur together because they have same environmental or behavioral risk factors such as poor sanitation or no breast feeding in infancy leading to increased exposure to infection. This co morbidity also result synergism leading to increased risk of death (6).

At national level 62.7% of populations do not have access to safe water and 71.1% do not have access to excreta disposal, and in Gambella 70.9% and 93.4% of urban population do not have access to safe water and excreta disposal respectively (3)

2.6.6. Health service utilization

Systematic attention to equity assessment, in addition to overall population coverage, is important if high coverage is to be achieved for the poor and existing data are often underused (22).

In Sub-Saharan Africa less than 40% of women deliver with skilled care (23). The National Health Service utilization (HSU) by rural population 9.5% is lower than urban (14%). The major reasons for low health service utilization are limited access, poor quality of service, understaffing and under financing (10).

The core of neonatal deaths depends on the interventions that span the continuum through the antenatal, intrapartum and postnatal periods (24). Low demand for care and late use are often linked to the barriers of low acceptability or affordability. Long waiting times, e.g. for antenatal care (ANC) -result in high opportunity costs, even when service is free. Social distance between mother and health workers, because they are men or from a different caste or ethnic group, reduces cultural acceptability. Comparing the profiles of users and nonusers of services is essential for overcoming barriers (22).The regional antenatal coverage is 19.8% and attended delivery coverage is 12.3% (1)

Evidence from a community and family survey on patterns of maternity service utilization in Southern Ethiopia revealed that 26.1% and 3.3% of the women received antenatal and delivery care service respectively. Women living in rural areas are less likely to receive ANC than those women in urban areas (21.41 Vs.1%). Despite the fact that maternal health care utilization is essential for the improvement of material

and child health, little is known about the level and patterns of use of service in Ethiopia (25).

3. OBJECTIVES

3.1. General objective

To determine the household prevalence of illness and factors associated among children in Gambella Special Woreda.

3.2 Specific objectives

3.2.1. To assess household prevalence of childhood illnesses

3.2.2. To assess nutritional status of children of mothers/caretakers

3.2.3. To assess socio-demographic, nutritional and environmental factors associated with childhood illnesses

3.2.4 Use study result as base line data for planning and intervention of child health programmes

4. METHODOLOGY

4.1 Study area and design

A cross sectional community based house to house survey was conducted in urban and rural Kebeles in Gambella district West Ethiopia from 20/5/98 to 20/6/98E.C.to determine household illness prevalence pattern of the under fives and their risk factors. The region is divided into three Administrative Zones, namely The Nuer Zone, The Anyuak Zone, The Mezenger Zones and one special woreda (Gambella Zuria). The Nuer Zone has two weredas (Akobo & Jikawo), the Anyuak Zone has three Weredas (Alwero- Openo, Gilo & Dima) the Mezenger Zone has one Wereda – Godere (see annex). The study area (Gambella special wereda), has population of 40,181 from 5 urban kebeles (30,322) and 12 rural kebeles (9859) – See-Annex.

4.2. Study population

The source population was all children under fives living in 17 kebeles from urban and rural areas in Gambella special wereda, 5 urban and 12 rural kebeles. The total under five population was 6027, namely 4458 from five urban and 1479 from 12 rural kebeles -See Annex

4.3 Sample size

Sample size was calculated using one proportion formula:

$$n = \frac{Z_{\alpha/2})^2 P (1-P)}{d^2}$$

Taking an estimated prevalence of childhood illness 40% (3), and allowing an error of 5% of detecting the estimated prevalence by chance alone with 95% confidence interval, the sample size required was 368.

However, taking into account the clustering (design) effect, the sample size was doubled. Allowing 10% contingency for non-response, the total sample size required for the study was 811.

4.4. Sampling procedure

The proportional sampling probability to size (PPS) was used. First, the list of kebeles (clusters) and measure of size of under five children was recorded (See Annex.). Starting from the top of the list, cumulative measure of size was calculated.

The total number of under five populations was divided by the sample size to get the sampling interval. A number between 1& the sampling interval was selected randomly. All kebeles (clusters) contacting the interval was included-See Annex.

At each kebele, the data collector will assumed a central point, rolled pencil on paper to get random starting point (household) to start data collection and visit every household in which there is under five in a clock wise direction until the sample allocated for the cluster (kebele) was obtained. Every household in which there was/were under five children were be surveyed until the required sample size was obtained. Since samples allocated for rural kebeles based on PPS were small, samples were deliberately increased for rural kebeles to make reasonable sampling (see annex).

4.5 Data collection instruments and tools

4.5.1 Data collection instruments

The study type was both quantitative (questionnaire) and qualitative (observation of main source of water for drinking and kind of excreta disposal system household use).The types of data were also both quantitative (Anthropometric) and qualitative (Categorical). Since birth certificate is not usual in the area age was determined from caretaker's word. Cultural and religious events were utilized to facilitate recall.

A structured questionnaire was designed for the purpose of the study. The standard questionnaire was translated to local languages by high school teachers.

Parents or caretakers of children under five were requested to recall any illness their child experienced two weeks prior to the interview date. Tracers were used to facilitate recall.

The questionnaire included socio demographic characteristics of children & mothers/care givers, household illnesses and health related practices, childhood immunization, child nutritional assessment ,anthropometric measurement, maternal health service utilization, and environmental assessment

Data collectors were health workers from RHB/Hospital from respective natives and guiders were people from kebele who know the locality speak local language. Training was given to 1 supervisor, 6 data collectors and 6 guiders/ translators for two days on research plans, data collection, and measurements.

Data collection was conducted for 15 days (8 days urban and 7 days rural). A driver, car instruments (measuring scale, hanging spring, measuring board and measuring tape) was supplied by regional health bureau(RHB). Supervision was conducted by master of public health(MPH) student at Jimma University for 15 days, who is also native and speaks local language.

Data that was compiled, cleaned, coded entered and analyzed using computer software EPI-INFO version. For analysis of data base line census data of an initial DHS was used for determination of prevalence and risk factor analysis. This included determination of household prevalence of illness, analysis of socio demographic factors between cases (children with household illnesses) and non cases (children with no household illnesses), analysis of nutritional status, and social demographic factors between cases and non cases and analysis of environmental conditions between cases and non cases.

Variables included were residence, age, sex, marital status, ethnicity, religion**,** educational status, occupation, monthly income, parity, family size number of

under fives in household, household illness, health service utility, bed net use, breast feeding, supplementary feeding, immunization, antenatal care, delivery, family planning use ,measurement of weight, height/length, mid upper arm circumference, observation of source of water and latrine.

4.5.2 Data collection procedure

The survey started at random start household and every consecutive house in which there was one or more under five was legible and mother/care giver were the respondent. When there was more than one under five in household, the youngest was included in the study. When child with illness was encountered, advice was given to take to health facility and home care if already not on treatment.

The respondent was briefed about the survey by local language and agreement reached at. When mother /care giver was not available or not willing, special record was documented by data collector by gathering information about the household from the neighbors/relatives/husband/client with arrangement for revisit of household and the next household continued.

Nutritional status of children under 5 was assessed by measuring weight, and height / length based on the recommendations by D.B. Jeliff 1966. A portable scale was used to measure the weight and measuring board was used to measure the height of children above 3 yrs and length of children below three years.

Mid upper arm circumference (MUAC) was measured for those above 12 months of age using plastic measuring tape. Weight for age and height for age measurements was expressed as standard deviation scores (z Scores) and results were compared it with those for with those for NCHS/WHO reference data. Finally, direct observation of water source for drinking and latrine was accomplished.

4.6 Operational definitions

Kola – Elevation below 1500metres above sea level

Woinadega – 1500-2500 above sea level

Dega – Refers to areas greater or equal to 2500m above sea level

Kebele – The smallest administrative unit in urban or rural areas.

Urban – Area where greater or equal to 4000 people live (26)

- Facilities like school and health institution

-Majority of people are non farmers

Rural–Area where less than 4000 people live (26)

–Majority of people are farmers.

Child – Refers to one to four years old (365 days to 4 years and 364 days)

Under five–A child less than 5 years old

Infant-Child less than 1 year old (365 days)

Illness–Any ill health condition of under five children in the last two weeks as perceived by mother/caretaker

Diarrhea–under five child having loose stool three or more times within 24 hours, at least one episode, in the last two weeks as perceived by the mother

Cough/difficult breathing–A child less than five years of age who had episode/s of cough/ difficult breathing in the last two weeks, as perceived by the mother/ care giver

Fever– A child less than five years of age who was febrile to touch in the last two weeks, as perceived by mother/ caregiver

Malaria–A child less than five years of age with fever or fever with headache, back pain, chills, sweats, myalgia (muscle pain), nausea and vomiting in the last two weeks as perceived by mother/ caregiver

Measles – Under five child with fever and maculopapular (non vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) during the previous two weeks as perceived by the mother.

Fertility– The number of full term children previously born by a woman, excluding miscarriages, or abortions in early pregnancy, but including stillbirths

ANC User– A woman who visited ANC in the health facility at least once during pregnancy that terminated in a live birth.

House hold– A person or a group of related and unrelated persons who live together in the same dwelling unit(s) or in connected premises, who acknowledge one adult member as head of the household and who have common arrangements for cooking and eating their food.

Member of household –A person constituting a household

Household size–The total number of members of a household

Income – Refers to domestic consumption of own crops and own livestock and livestock products, domestic consumption of goods and services purchased for resale or produced or processed in the household enterprise other than agriculture, wages and salaries, allowance, overtime, bonus, pension, commission, discounts(i.e. concessions obtained),imputed rent of free housing(i.e. subsidized amount only), imputed rent of owner occupied housing, other employees benefit, rest received, profit and dividend received, remittance(regularly received),value of items received free(i.e. firewood, water etc) rent of personal possessions, alimony,(regularly received) and other types of income.

Occupation – Major product or industrial division of the establishment in which the respondent was engaged during the survey.

Safe water–Includes, piped chlorinated water

– Exposed water sources (pond or well) if protected from contamination by people or animals

–Protected water sources (Example-closed well with cover)

– Boiled water from any reliable source

Unsafe water–water collected from unprotected spring, well and river.

Malnutrition- nutritional disorder or a condition resulting from faulty or inadequate nutrition

Anthropometrics – A technique that deals with the measurement of the size, weight and proportions of human body.

Underweight–Child with weight for age of below -2SD (Standard deviation)

Stunted–with height for age of below -2SD (Standard deviation)

Wasted –with weight for height of below -2SD (Standard deviation)

Malnourished child - A child having one or more of the nutritional indexes below -2SD and / or MUAC below or equal to 13.5 cm.

Child with household illness- A child having one or more type of perceived illness

4.7. Data quality control

The structured questionnaire was translated to Anyuak, Nuer by high school teachers and Amharic languages and discussions were made if there are culturally unacceptable questions, ambiguous words etc with women of respective ethnic groups. Then the questionnaire was pre tested on local people. Training was given for one supervisor and six data collectors and six translators/guiders and included provision of handouts on a review of general study objectives and procedures, detailed discussion of every data item to be collected and discussion of how to resolve potential problems, practical session on measurement and observations based on standard way. The data collection format of each data collectors was checked daily for completeness, missed or other relevant information on meeting and supportive supervision during data collection as well as by recollecting sub sample of study population by supervisor. Data editing was done by the data collectors, supervisors and the principal investigator in the field and further cleaning of data, coding and entry to computer.

4.8. Ethical considerations

The willingness of the mother/ caregivers, or husband/ client was obtained and verbal consent obtained before interview in every household. Discussion with concerned bodies in the regional health bureau, wereda council, and kebeles on the objectives, future use of the information for the betterment of child health in the community, and ethical clearance, and was obtained. Letter was written to the regional health bureau from Addis Ababa University. Data collectors, guiders / translators/ and supervisors also gave informed consent to carry out the survey.

5. RESULTS

5.1 Sociodemographic description of the study subjects

The sample size was calculated to include 811 households but based on PPS, samples of households allocated for rural kebeles had very small probability to be included in the study. To make reasonable sampling, number of households in rural kebeles were increased making total households 837 as shown in annex. Out of 837 households included in the study, relevant information could be obtained for 831 making the response rate 99.2%. The sociodemographic characteristics of mothers is shown in Table 1.

Majority of mothers were residing in urban 566 (71.1%), and 230 (28.9%) were living in rural. The mean age of the mothers was 25.2 years with standard deviation of 6.0 years. The mean age for mothers residing in urban was 25.0 years with standard deviation of 5.9 years .The mean age for mothers residing in rural was 25.6 years with standard deviation of 6.4 years. Majority of the women 773 (92.6%) were currently married of which 542 (64.9%) were from urban and 231 (27.7%)

were living in rural. About 287 (37.8%) of currently married women were in polygamy of which 202 (26.6%) were living in urban and 85 (11.2%) were living in rural.

With regards to ethnicities about 394 (47.3%) were Anyuak, 205 (24.6%) were Nuer and 95 (11.4%) were Oromo. Majority 594 (71.3%) of mothers were protestant, of which 402 (67.7%) were in urban and 192 (32.3%) were in rural. With regard to literacy, 312 (37.5%) were illiterate of which 201 (24.2%) were living in urban and 111(13.4%) were living in rural. About 497(59.7%) were housewives of which 300 (36.1%) were living in urban. About 231 (53.2%) of households had income of 50 Birr or less per month of which 122 (27.6%) were in urban and 109 (24.7%) were in rural.

The mean age at first marriage was 17.1 years with standard deviation of 2.2 years. No much difference was seen between urban and rural. Early marriage occurs in 408(59.1%) of urban and 194 (28.1%) of rural respectively. The mean age at first birth was 18.6 years with standard deviation of 2.3 years (18.6$\pm$ 2.3 and 18.8$\pm$ 2.5 years for urban and rural respectively). Early delivery occurs in 340(48.5%) of urban and 158(22.5%) of rural respectively.

The mean fertility of a woman was 2.7 children with standard deviation of 1.7 (2.7$\pm$ 1.7 for urban women and 2.5$\pm$ 1.4 for rural women). The number of live births ranged from 1 to 11.

The mean number of household size was 6.2 with standard deviation of 3.8 ranging from 1 to 31 (6.4$\pm$ 3.9 for urban household and 5.7$\pm$3.3 for rural household). About 540 (65.6%) of households had size of one to six of which 357 (43.7%) were in urban and 183 (22.2%) were in rural. The mean number of under five children in household was 1.61 with standard deviation of 1 (1.6$\pm$1 for urban and 1.5$\pm$0.7 for rural). About 363(43.5%) of urban and 135(16.2%) of rural women had one under five child.

Table 1. Socio demographic characteristics of mothers in Gambella special wereda, 1998 E.C.

sociodemographic character	Urban	Rural	Total
	No. (%)	No. (%)	o. (%)
Age of the mother			
15-19	65 (8.2)	26 (3.3)	91 (11.4)
20-24	112 (14.1)	50 (6.3)	162 (20.4)
25-29	22 (2.8)	6 (0.8)	28 (3.6)
30-34	64 (8.0)	32 (4.0)	96 (12.0)
35-39	99 (12.4)	22 (2.8)	121 (15.2)
40-44	78 (9.8)	20 (2.5)	98 (12.3)
45-49	61 (7.7)	35 (4.4)	96 (12.1)
50-54	6 5(8.2)	39 (4.9)	104 (13.1)
Marital status			
Unmarried	23 (2.8)	1 (0.1)	24 (2.9)
Married	542 (64.9)	231	773 (92.6)
Divorced	6 (0.7)	(27.7)	10 (1.2)
Widowed	18(2.2)	4 (0.5)	20 (3.4)
		10 (1.2)	
Polygamous marriage			
No	330 (43.5)	142	472 (62.2)
Yes	202 (26.6)	(18.7)	287 (37.8)
		85 (11.2)	
Ethnicity			
Anyuak	210 (25.2)	184	394 (47.3)
Nuer	172 (20.6)	(22.1)	205 (24.6)
Oromo	86 (10.3)	33 (4.0)	95 (11.4)
Amhara	39 (4.7)	9 (1.1)	41(4.9)
Tigre	30 (3.6)	2 (0.2)	32 (3.8)
Kembata	26 (3.1)	2 (0.2)	26 (3.1)
Komo	10 (1.2)	0 (0)	25 (3.8)
Others	15 (1.8)	15 (1.8)	15 (1.8)
		0 (0)	
Religion of the mother			
Protestant	402 (48.3)	192 (23)	594 (71.3)
Orthodox	116 (13.9)	9 (1.1)	125 (15.0)
Muslim	37 (4.4)	0 (0)	37 (4.4)
Catholic	16 (1.9)	15 (1.8)	31 (3.7)
Others	17 (2.1)	29 (3.5)	46 (5.6)
Educational status			
Illiterate	201(24.2)	111	312 (37.5)
Read & write	16(1.9)	(13.4)	16 (1.9)
1-6	188 (22.6)	0 (0)	282 (33.9)
7+	181 (21.8)	94 (11.3)	221 (26.6)
		40 (4.8)	

Occupation			
Housewife	300 (36.1)	197	497 (59.7)
Jobless	142 (17.1)	(23.7)	163 (19.6)
Govt. employee	73 (8.8)	21 (2.5)	74 (8.9)
Student	29 (3.5)	1 (0.1)	37 (4.5)
Trader	31 (3.7)	8 (1.0)	34 (4.1)
Farmer	8 (1.0)	3 (0.4)	23 (2.8)
Other	3 (0.4)	15 (1.8)	4 (0.5)
		1 (0.1)	
Income (Birr/month)			
<50	122 (27.6)	109	231 (53.2)
>=50	147 (33.3)	(24.7)	211 (47.7)
		64 (14.5)	
Age at first marriage			
<15	25 (3.6)	5 (0.7)	30 (4.3)
16-19	383 (55.5)	189	572 (82.9)
20-24	67 (9.7)	(27.4)	79 (11.4)
25+	9 (1.3)	12 (1.7)	9 (1.3)
		0 (0)	
Age at first birth			
<15	3 (0.4)	1 (0.1)	4 (0.6)
15-19	337 (48.1)	157	494 (70.5)
20-24	134 (19.1)	(22.4)	179 (25.5)
25+	22 (3.1)	45 (6.4)	24 (3.4)
		2 (0.3)	
Fertility			
<3	332 (39.8)	138	470 (56.4)
>=3	256 (30.7)	(16.5)	364 (43.6)
		108	
		(12.9)	
Household size			
<=6	357 (43.4)	183	540 (65.6)
>6	220 (26.7)	(22.2)	283 (34.4)
		63 (7.7)	
Under five child in house hold			
1	363 (43.5)	135	498 (59.7)
2-5	217 (26.0)	(16.2)	326 (39.1)
>5	9 (1.1)	109	10 (1.2)
		(13.1)	
		1 (0.1)	

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A total of 831 children were included in the study from both urban and rural kebeles of gambela special wereda. the mean age for the children was 21.7months and standard deviation of 14.6 months (21.0$\pm$ 14.6 for urban and

23.4± 14.6 months for rural respectively). majority of the children 410(49.3%) were 2 and above years of age. about 449 (54%) were males and 382 (46%) were females. the median age for males and females was 22.0 and 24.0 months respectively. about 588 (70.8%) of children reside in urban and 243 (29.2%) reside in rural. there was no difference observed by sex and residence. The sociodemographic character of children is shown in Table 2

Table 2. Socio demographic characteristics of children in Gambella special wereda, 1998 E.C.

Characteristics	Urban	Rural	Total
	No. (%)	No. (%)	No. (%)
Age in months			
0-11	184 (22.1)	37 (4.5)	221 (26.6)
12-23	123 (14.8)	77 (9.3)	200 (24.1)
24-59	281 (33.8)	129 (15.5)	410 (49.3)
Sex			
Male	319 (38.4)	130 (15.6)	449 (54.0)
Female	268 (32.3)	114 (13.7)	382 (46.0)

5.2. Prevalence of illness and malnutrition among children the previous two weeks

The two weeks prevalence of household illness among children was 422(50.6%), out of which 327 (39.2%) were in urban and 95 (11.4%) were in rural. about 328(55.6%) of urban and 93(38.6%) of rural children had illness. about 223 (26.9%) children were ill among males and 199(24.0%) were ill among females.

The two weeks prevalence of diarrhoea was 170(20.5%), malaria 148(17.8%), fever 56(6.6%)), cough/shortness of breath 56(6.7%), measles 4(0.5%) and other 60(7.2%).

Diarrhoea was most prevalent among children of age group 12-23 months 51(25.5%). The prevalence of diarrhoea among urban children was 124(21.1%) and among rural 46(18.7%), the prevalence of diarrhoea among males was

91(20.5%) and among females 79(20.7%). malaria was also most prevalent among age groups 12-23 months 39(19.5%). the prevalence of malaria among urban children was 127(21.5%) and the prevalence among rural was 21(8.5%). malaria prevalence among males was 81(18.0%) and among females 67(17.5%). fever was most prevalent among age groups of 0-11 months 18(8.1%). the prevalence of fever among urban was 42(7.3%) and among rural 13(5.3%). fever among males was 24(5.6%) and among females 31(8.1%). cough/shortness of breath was most prevalent among age group 12-23 months 15(7.5%). the prevalence of cough/shortness of breath(sob) among urban children was 39(6.6%) and among rural 17(6.9%), cough/shortness of breath among males was 24(5.3%) and among females 32 (8.4%).

About 411(70%) and 99(41.0%) of urban and rural children had one or more illnesses respectively. The distribution of illness among children is shown in Table 3.

Table 3. Distribution of illness among under five children by socio demographic factors in Gambella special wereda 1998 E.C.

Characteristics	Type of illnesses					
	Diarrhoea	Malaria	Fever	Cough/ sob	Measles	Other
	No. (%)	No. (%)	No.(%)	No.(%)	No. (%)	No. (%)
Age in months						
0-11	40 (18.1)	34 (15.4)	18 (8.1)	12 (5.4)	1 (0.5)	35 (15.8)
12-23	51 (25.5)	39 (19.5)	9 (4.5)	15 (7.5)	1 (0.5)	15 (7.5)
24-59	79 (19.3)	75 (18.3)	28 (6.8)	29 (7.1)	2 (0.5)	20 (4.9)
Sex						
Male	91 (20.5)	81 (18.0)	24 (5.6)	24 (5.3)	2 (0.4)	52 (11.6)
Female	79 (10.7)	67 (17.5)	31 (8.1)	32 (8.4)	2 (0.5)	40 (10.5)

Residence Urban Rural	124 (21.1) 46 (18.7)	127 (21.5) 21 (8.5)	42 (7.3) 13 (5.3)	39 (6.6) 17 (6.9)	4 (0.7) 0 (0.0)	74 (12.5) 14 (5.7)
Total	170 (20.5)	148 (17.8)	55 (6.6)	56 (6.7)	4 (0.5)	60 (7.2)

A total of 606 children aged 12 months and above were included in the anthropometric measurements. Children aged 6-11 months were excluded from measurements of weight and height because of inconvenience of measurements and errors. Also, muac was done for children 12 and above months of age. The prevalence of stunting among children aged 12 months and above was 225(37.3%). stunting was present among 140(42.8%) of males and 85(30.9%) of females. stunting was more common among children aged 24 months and above 177(43.6%) as compared to those 12-23 months 48(24.4%). about 140(34.9%) and 85(42.2%) of urban and rural children aged 12 months and above respectively were stunted.

Tthe prevalence of wasting was 112(26.4%). wasting was more common among children aged 12-23 months 46(23.4%) as compared to children aged 24-59 months 66(16.3%). the prevalence of wasting among males and females was 58(17.7%) and 55(19.9%) respectively. the prevalence of wasting among urban and rural children was 73(18.4%) and 39(19.3%) respectively.

The prevalence of underweight was 176(29.2%). underweight was more common among children aged 24 months and above 133(32.8%) as compared to children aged 12-23 months 43(21.8%). the prevalence among males and females was 106(32.4%) and 70(25.3%) respectively. the prevalence of underweight among urban and rural children was 119(29.6%) and 57(28.2%) respectively.

The prevalence of MUAC less or equal to 13.5cm among children aged 12 months or more was 157 (26.0%). MUAC of 13.5 cm. or below was more common among children aged 12-23 months 63(31.8%). about 81(25.1%) of males and 76(27.4%) of females had MUAC 13.5 cm. or below respectively. MUAC of 13.5 cm or below was more common in rural children which was 71(17.9%) among urban children and 86(43.0%) among rural children (Table 4)

Table 4. Nutritional statuses of under five children in Gambella special wereda 1998 E.C.

Characteristics	Nutritional status of the children			
	Stunting	Wasting	Underweight	MUAC≤13.5cm
	No. (%)	No. (%)	No. (%)	No. (%)
Age in months				
0-11	-	-	-	-
12-23	48	46	43 (21.8)	63(31.8)
24-59	(24.4)	(23.4)	133 (32.8)	94(23.2)
	177	66		
	(43.6)	(16.3)		
Sex				
Male	140 (42.8)	58 (17.7)	106 (32.4)	81(25.1)
Female	85 (30.9)	55 (19.9)	70 (25.3)	76(27.4)
Residence				
Urban	140 (34.9)	73 (18.4)	119 (29.6)	71(17.9)
Rural	85 (42.2)	39 (19.3)	57 (28.2)	86(43.0)
Total	225 (37.3)	112 (26.4)	176 (29.2)	157(26.0)

5.3. Bed net presence, quality and use

Of the total households 700(83.8%) had bed nets namely 462(78.3%) of urban households vs. 238(97.1%) of rural households. about 73.9% of the households had bed nets impregnated less than 6 months ago namely, 491(79.0%) of urban households and 158(64.0 %) of rural households. in 553(80%) of the households (318 or 69.9 % of urban households and 235 or 99.6 % of rural households) the youngest under five children has slept under the bed net the previous night. the distribution of bed nets, their quality and use is shown in table 5.

Table 5. Bed net presences, quality and use in Gambella special wereda, 1998 e.c.

Characteristics	Urban	Rural	Total
	No. (%)	No. (%)	No. (%)
Bed net present in house hold	462 (78.3)	238 (97.1)	700 (83.8)
Bed net impregnated less than 6 months ago	491(79.0)	158(64.0)	649(73.9)
Child slept under bed net last night	318 (69.9)	235 (96.6)	553 (80)

5.4. Infant / child feeding practices

A total of 780 mothers gave information on the time of initiation of breast feeding. About 281(36.5%) of mothers initiated breast feeding within one hour of delivery that is 250(45.3%) of urban mothers and 31(14.2%) of rural mothers out of the total mothers who initiated breast feeding within one hour of delivery of child, 250(32.5%) were living in urban and 31(4%) were living in rural. about 514(63.4 %) of mothers breast feeding for more than 12 months, that is 332(58.0 %) of urban mothers and 182(77.4%) of rural mothers. about 551(80.0%) of mothers breast feeding for more than 6 months that is 365(75.4%) of urban mothers' and 186(91.2%) of rural mothers. About 335(59.5%) of mothers initiate supplementary feeding at 4-6 months of age that is 282(65.0%) of urban mothers and 53(.41.1%) of rural mothers. breast feeding practices are shown in table 6

Table 6. Feeding practices by address Gambella special wereda, 1998e.c.

Practice	Urban	Rural	Total
Initiation of breast feeding less or equal to 1hr. of birth	No. (%) 250 (45.3)	No. (%) 31(14.2)	No. (%) 281 (36.5)
Breast feeding more than 12 months	332 (58.0)	182 (77.4)	514 (63.4)
Breast feeding more than 6 months	365 (75.4)	186 (91.2)	551 (80.1)
Supplementary feeding at 4-6 months of age	282 (65.0)	53 (41.1)	335 (59.5)

5.5 MCH/RH service utilization

The prevalence of current FP users was 223(28.2 %). majority of current FP users were living in urban about 203(36.1%) of urban mothers and 20(8.8%) of rural mothers were current family planning users. about 566(68.4%) of mothers had ever visited ANC during the most recent pregnancy. about 477 (81.8%) of urban mothers' and 89(36.5%) of rural mothers had ever visited ANC. The proportion of women receiving ANC in urban (81.8%) was more than two times compared to the proportion of women living in rural (36.5%)(37. About 178(37.3%) women continue ANC follow up more than 4 times while 26(29.2%) women living in rural did so. about 335(57.6%) of urban women gave the last birth in health facility while 41(16.9 %) of rural mothers gave the last birth in health facility. MCH/RH service use is shown in Table 7

Table 7. MCH/RH service utilization by address Gambella special wereda, 1998 E.C.

Service	Urban	Rural	Total
	No. (%)	No. (%)	No. (%)
Currently FP using	203(36.1)	20(8.8)	223(28.2)
ANC visit during pregnancy	477(81.8)	89(36.5)	566(68.4)
ANC more than 4 times	178(38.9)	26(31.7)	204(37.8)
Delivered in health facility	335(57.6)	41(16.9)	376(45.6)

5.6. Child immunization

Immunization coverage both by card and by interview was 527(64.8%) for BCG. The coverage for polio namely polio-1 for those with card and any polio except polio-0 for those with no EPI card for the child was 525(64.8%), for DPT(DPT-1 for those with card and any DPT for those with no EPI card) 486(60.1%), for measles 317(50.1%). About 677(83.7%) of children were immunized during the national immunization days (NID) Immunization status is shown in table 8.

Table 8. Immunization statuses by address in Gambela special wereda, 1998 E.C.

Immunization Status	Urban		Rural		Total
	With card	With no card	With card	With no card	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
BCG	190 (93.1)	247 (67.3)	13 (100)	77 (33.6)	527 (64.8)
Polio	186 (93.9)	235 (64.2)	13 (100)	91 (39.1)	525 (64.8)
DPT	185 (94.4)	229 (62.6)	9 (69.2)	63 (27.6)	486 (60.1)
Measles	76 (66.7)	177 (59.4)	3 (23.1)	61 (29.5)	317 (50.1)
NID	160 (79.2)	319 (87.2)	12 (92.3)	186 (81.9)	677 (83.7)

5.7. Environmental assessment

A total of 831 households were assessed for the source of water and 763 households gave information on the continuity (throughout the year) of supply of water. In addition, the safety of water was assessed . A total of 819 households gave information on excreta disposal for the members of the household followed by observation.

With regard to environmental assessment 344(45.2%) of households who gave information on safety and continuity had access to safe water for drinking that is 250(45.8%) of urban and 94(43.1%) of rural households. Generally only 129(17.0%) of households had safe and continuous supply of water that is 113(20.7% of urban households and 16(7.3%) of rural households.

About 303(37.0%) of households had access for excreta disposal. About 302(50.9%) of urban and 11(4.4%) of rural households had latrine for excreta disposal respectively. About 235(95.5%) of the rural households use open field for excreta disposal (Table 9).

Tale 9. Accessibility and adequacy of water & excreta disposal by area of residence in Gambella special wereda, 1998 E.C.

Water and excreta disposal			urban	rural	total
			no. (%)	no. (%)	no. (%)
Water	unsafe	not continuous	20 (3.7)	3 (1.3)	23 (3.0)
		continuous	275 (50.4)	121 (55.5)	396 (51.9)
	safe	not continuous	137 (25.1)	78 (35.8)	215 (28.2)
		continuous	113 (20.7)	16 (7.3)	129 (17.0)
excreta disposal	latrine	private	123 (21.4)	4 (1.6)	127 (15.5)
		shared	169 (29.5)	7 (2.8)	176 (21.5)
	open field	open field	281 (49.0)	235 (95.5)	516 (63.0)

5.8. Health related practice

The prevalence of uvulectomy was 107(12.9%), that is 57(9.7%) of urban and 50 (20.6%) of rural. The prevalence of tooth extraction was 294(35.6%). About 182(31.2%) of urban and 112(46.1%) of rural children had undergone milk teeth extraction. The prevalence of pre lacteal feeding was 360(44%). About 305(52%) of urban and 55(23.7%) of rural children were given pre lacteal feeding. 300(47%) of children were fed by their mothers that is 180(39.5%) of urban 120(65.9 %) of rural children were fed by their mothers. With regard to hand washing before feeding the child, 563(97.7%) of urban and 239(29.1%) of rural mothers wash hands before feeding the child. Health related practices are shown in Table 10.

Table 10. Health related practice by address in Gambella special wereda, 1998 E.C.

Practice	Urban	Rural	Total
	No. (%)	No. (%)	No. (%)
Uvulectomy	57(9.7)	50 (20.6)	107 (12.9)
Tooth extraction	182 (31.2)	112 (46.1)	294 (35.6)
Pre lacteal feeding	305 (52.0)	55 (23.7)	360 (44.0)
Child fed by mother	180 (39.5)	120 (65.9)	300 (47.0)
Hand washing before food preparation	574 (99.0)	238 (97.6)	812 (98.8)

Hand washing before feeding child	563 (97.7)	239 (99.1)	802 (97.7)
Hand washing back from passing excreta	454 (81.1)	239 (98.0)	693 (86.2)
Use of soap for hand washing back from passing excreta	413 (73.5)	210 (85.7)	623 (77.2)

5.9. Maternal factors associated with illness

About 588 (70.5%) 0f children were from urban and 246 (29.5%) were from rural. The prevalence of illness among urban children was 327(55.6%) and among rural 95(38.6%). A total of 442 households gave information on income. About 231 households had monthly income of less or equal to 50 Birr and 211 house holds had monthly income of more than 50 Birr. The prevalence of illness among children with households having income less than or equal to 50 Birr per month was 105(45.3%) and among children with households having income more than 50 Birr per month was 116(56.8%). The prevalence of illness among children from households with members less or equal to 6 was 253(47%) and among children from households with members more than 6 was 163(57.8%). The prevalence of illness among children in households where there was one under five child was 225(45.5%) and among children in households where there was more than one child was 196(58.3%). Of maternal factors address, income, & number of under five in households were associated with illness.

Table 11. Maternal, socio demographic and economic factors associated with illness Gambella special wereda, 1998 E.C.

Maternal factor	No of ill (%)	OR (95% CI)	Adjusted OR (95% CI)
Address			
Urban	327 (55.6)	0.502 (0.371-0.680)*	0.443 (0.332-0.612)*
Rural	95 (38.6)		
Maternal age			
≤25	246 (52.6)	0.886 (0.667-1.176)	
>25	161 (49.5)		
Marital status			
Married	385 (50.9)	0.847 (0.504-1.423)	
Other	29 (46.8)		
Polygamous marriage	243 (51.8)	0.924 (0.688-1.239)	
No	143 (49.8)		
Yes			
Religion of the mother	311 (52.4)		
Protestant	110 (46.4)	1.273 (0.941-1.722)	
Others			
Educational status			
Illiterate	155 (49.7)	1.069 (0.324-2.120)	
literate	265 (51.4)		
Income (Birr/month)	105 (45.3)	1.593(1.211-2.097)*	1.828 (1.367-2.444)*
≤50	116 (56.8)		
>50			
Age at first marriage			
<15	17 (56.7)	0.846(0.404-1.769)	
≥15	345 (52.5)		
Age at first birth			
≤19	257 (51.8)	1.047(0.755-1.454)	
20+	107 (53.0)		
Fertility			
≤2	232 (49.6)	1.117 (0.849-1.470)	
3+	190 (52.3)		
Household size			
≤6	253 (47.0)	1.543(1.154-2.064)*	1.247 (0.903-1.722)
>6	163 (57.8)		
Under five child in house hold			
1	225 (45.5)	1.680 (1.270-2.223)*	1.629 (1.194-2.224)*
>1	196 (58.3)		

The prevalence of illness among children of age below 12 months was 110(50.0%) and among children of age 12 or above months was 310(50.9%). The prevalence of illness among males and females was 223(49.8%) and 199(52.2%) respectively. When age adjustment was made for feeding practices, initiation of breastfeeding after one hour of birth was also found risk for those aged below 1 year of age. The prevalence of illness among children breast fed for less than 6 months was 56(41.2%) and among those fed more or equal to 6 months was 287(52.3%). About 353(83.7%) of children with illness were breast fed more or equal to 6 months. Nearly half of children were not started on supplementary feeding during the recommended period of 4-6 months.

The prevalence of illness among stunted children was 104(46.2%) and among non stunted 205(54.2%). The prevalence of illness among wasted children was 63(56.2%) and among non wasted was 247(50.4%). The prevalence of illness among underweight children was 99(55.9%) and among non underweight was 214(49.9%). The prevalence of illness, among children having MUAC less or equal to 13.3 cm. was 76(48.4%) and among those with MUAC greater than 13.5 cm. was 231(51.7%). Because each type of malnutrition is not independent there is a need to control confounders. Making adjustment, stunting and underweight had association with illness. Because each type of malnutrition was not independent to each other, regression of malnutrition for controlling confounding, underweight status and stunting were associated with illness.

Age adjustments were made for EPI which revealed measles vaccination to be protective for children aged below one year. The details are shown in table 13.

Table 12. Feeding practices nutritional and immunization factors associated with illness Gambella special wereda, 1998 E.C.

Child factor	No of ill (%)	OR (95% CI)	Adjusted OR (95% CI)
Age in months			
0-11	110 (50.0)	1.037 (0.762-1.411)	
12+	310 (50.9)		
Sex			
Male	223 (49.8)	1.103 (0.839-1.450)	
Female	199 (52.2)		
Initiation of breast feeding after birth			
≤hour	158 (56.4)	0.747 (0.556-1.004)	0.598 (0.403-0.887)*
>1 hour.	240 (49.2)		
Breast feeding duration			
<6months	56 (41.2)	1.565 (1.070-2.289)*	1.708 (0.980-2.977)
≥6month	287 (52.3)		
Supplementary feeding at 4-6 months			
No	102 (45.1)	1.299 (0.925-1.823)	1.257 (0.798-1.978)
Yes	172 (51.7)		
Stunting			
No	205 (54.2)	0.719 (0.517-1.001)	0.642 (0.440-0.935)*
Yes	104 (46.0)		
Wasted			
No	247 (50.4)	1.240 (0.822-1.870)	0.924 (0.569-1.500)
Yes	63 (55.8)		
Under weight			
No	214 (49.9)	1.275 (0.897-1.813)	1.597(1.031-2.475)*
Yes	99 (55.9)		
MUAC ≤13.5cm			
No	231 (51.7)	0.846 (0.589-1.214)	0.811 (0.554-1.188)
Yes	76 (47.5)		
BCG			
No	120 (42.1)	1.723 (1.288-2.306)*	1.549 (0.934-2.568)
Yes	292 (55.6)		

Polio No Yes	 128 (44.8) 281 (54.4)	 1.470 (1.099-1.965)*	1.347(0.784-2.315)
DPT No Yes	 155 (46.3) 256 (54.6)	 1.396 (1.053-1.849)*	1.205 (0.699-2.075)
Measles No Yes	 162 (51.4) 163 (51.7)	 1.013 (0.741-1.384)	 0.606 (0.386-0.952)*

About 187(51.9%) of children whose households members had access to safe water were ill. About 244 (47.5%) of children whose households members use open field for excreta disposal were ill while 177(56.0%) of children whose households members use latrine were ill. Making adjustments for residence, both safety of water and excreta disposal system did not show significant association.

With regard to bed net, 338(48.5%) of children living in households having bed net were ill and 83(61.5%) of children living in households with no bed net were ill. The environmental and bed net factors are shown in table 13

Table 13. Environmental and bed net as factors associated with illness Gambella special wereda, 1998 E.C.

Environmental factor	No of ill (%)	OR (95% CI)	Adjusted OR (95% CI)
Water source Unsafe Safe	 233 (49.7) 187 (51.9)	 1.095 (0.832-1.441)	1.063(0.805-1.404)
Excreta disposal Latrine Open field	 177 (56.0) 244 (47.5)	 0.710 (0.536-0.941)*	0.934(0.681-1.282)
Bed net in household No Yes	 83 (61.5) 338 (48.5)	 0.590 (0.405-0.860)*	
Bed net treated for < 6 month ≥6 month	 258 (50.0) 79 (44.1)	 0.790 (0.561-1.112)	

who slept under bed net last night? Adults Children	 59 (43.1) 271 (49.2)	 1.280 (0.878-1.866)	

About 111(50.2%) of children of current FP user mothers were ill and 285(50.3%) of children of mothers who are not using FP currently were ill. About 306(54.3%) of children whose mothers were ever ANC users were ill and 112(43.1%) of children whose mothers were not ANC users were ill.

Of those mothers who were ever ANC followers as well as have followed ANC more than 4 times, about 102(50.5%) of them had ill child. Nearly, 209(55.9%) of mothers of ill children delivered the child in health facility. Children whose mothers followed ANC were significantly had risk for illness and children delivered in health facility. were at lower risk of illness but when adjustment was made for age of child to see temporal relationship of service use and illness, there was no significant difference in illness between children aged below one year ad above one year- as shown in table 14.

Table 14. MCH / RH service utilization associated with illness in Gambella special wereda, 1998 E.C.

Service	No of ill (%)	OR (95% CI)	Adjusted OR (95% CI)
Current FP use No Yes	 285(50.3) 111(50.2)	 0.998(0.732-1.363)	
ANC visit No Yes	 112(43.1) 306(54.3)	 1.567(1.166-2.107)*	 1.281(0.993-1.760)
Number of ANC visits ≤4 >4	 184(54.9) 102(50.5)	 0.837 (0.590-1.188)	
Place of delivery Home Health facility	 283(46.8) 209(55.9)	 0.693 (0.526-0.914)*	 1.390(0.988-1.957)

About 71(67.0%) of children who had undergone uvulectomy were ill and 349(48.5%) of those who have not undergone uvulectomy had illness, 172(58.7%) of children who had undergone milk teeth extraction were ill, and 247(46.6%) of children who did not undergo milk teeth extraction were ill. About 198(55.2%) of children who were given something other than breast milk after birth were ill while 248(47.8%) of children who were not given were ill. Adjusting for age, uvulectomy, milk teeth extraction and prelacteal feeding were risk factors for illness for children aged one or more years as shown in table 16.

Table 16. Health related practices associated with illness in Gambela special

Practice	No of ill (%)	OR (95% CI)	Adjusted OR (95% CI)
Uvulectomy			
No	349(48.5)	2.156(1.402-3.316)*	2.176(1.409-3.360)*
Yes	71(67.0)		
Milk teeth extraction			
No	247(46.6)	1.629(1.221-2.173)*	1.651(1.229-2.216)*
Yes	172(58.7)		
Pre lacteal feeding			
No	248(47.8)	1.343(1.017-1.772)*	1.369(1.033-1.815)*
Yes	198(55.2)		

wereda,

6. DISCUSSION

In a country where there is low health service coverage and a very low health seeking behaviors, household surveys play a major role in identifying the morbidity pattern of a community in a country. Identification of common symptoms of illness is quite important especially in an era where IMCI is the best intervention to reduce morbidity and mortality of under five children by improving health worker skill, improving health system and improving household and community practices. The health service utilization in Gambella is the lowest of all regions. The outpatient visit per capita is 0.1 visit per person per year. (2) This makes community based assessment and intervention strategies necessary.

Over all illness prevalence was 422(50.6%) and the two weeks prevalence of diarrhoea was 170(20.5%), malaria 148(17.8%), fever 55(6.6%), cough/ SOB 56(6.7%), measles 4(0.5%) and other 60(7.2%). In a study done in Dabat, the illness prevalence was 154(33.7%) and the most common symptoms were fever 113(24.7%), cough 57(12.5%), and diarrhoea 52(11.4%). With regard to the overall illness prevalence, the prevalence in Gambella was significantly higher than that in Dabat (33.7%), SNNPR(40.0%), and the national Welfare Monitoring Survey(WMS) 2004 which was 35% ($p<0.05$).(5, 2,27) However, there are differences between the studies based on duration of study, sample sizes and urban to rural ratio of study subjects. Fever is a proxy indicator for malaria in malaria endemic places like Gambella. Hospital based study done in Gambella showed all children admitted with diagnosis of severe malaria including blood film revealing malaria parasite were reported to have fever(11). Hence the prevalence of malaria(and fever) was similar to the prevalence of fever in Dabat. But prevalence of cough/shortness of breath was lower and diarrhoea was higher than in Dabat.

The WMS in 2004 (except Gambella) showed the two weeks prevalence among children for diarrhoea, fever and cough to be 19.7%, 20.6% and 18.1% respectively (27). The prevalence of diarrhoea and fever reported by the national WMS was similar to the prevalence of diarrhoea and fever (and malaria) in Gambella but

prevalence of cough/shortness of breath was higher than that in Gambella. In a study done in SNNPR, 40% of mothers reported that their child had fallen sick in the previous two weeks, 30% with fever, 25% with diarrhoea, 23% with cough and 13% with rapid breathing (2). This study shows that the overall illness prevalence in Gambella (50.6%) to be higher than that in Dabat (33.7%) ,SNNPR (40%),as well as the study done by national Welfare Monitoring Survey 2004 which was 35% (27).
It can be shown that always there is always regional variation in predominant illnesses and their prevalence depending on the medical geography and socio-economic activities which should guide the development of region specific guidelines within the context of National Guidelines for intervention plans.

The prevalence of stunting, wasting, underweight and MUAC less or equal to 13.5cm, were 225(37.3%), 112(18.5%), 157(12.6%) and 157(26%)) respectively. Except for underweight, the prevalence were lower than the finding in the study done in Dabat which was 321(70.2%) for stunting, 231(50.5%) for wasting, 28(6.1%) for underweight and 174(44.6%) for MUAC (5).The prevalence of stunting, wasting and MUAC less or equal to 13.5 cm. in Gambella were significantly lower than that in Dabat while underweight was higher($p<0.05$). The difference is that in the study done in Dabat majority of study subjects 397(87%) study subjects were living in rural and the sample size was relatively small which was 457.

According to WMS 2004, the national prevalence (except Gambella) of stunting was 46.9%, wasting 8.3% and underweight 37.1%.(27) The prevalence of stunting and underweight in Gambella were lower, while wasting was higher than the results of the WMS. Again, there is regional variation with type and prevalence of malnutrition depending on seasonality and socio-economic activities. This calls for region specific nutrition programs and interventions.

Socioeconomic and demographic factors associated with household illness were residence. Children residing in urban were at higher risk Effects of household size,

feeding, bed net coverage , and use by child, water, health related behaviors might have roles in illness.

Children from households with monthly income of more than 50 Birr were at increased risk. The advantage of high income might be out weighed by other socioeconomic variables like ownership, control of possessions. About 128(60.9%) of mothers living in household with income more than 50 Birr per month were housewives by occupation. Intra household utilization of the income by mothers and use it for child care matters rather than just the availability or access of the income. The advantage of high income might be out weighed by other socioeconomic variables like ownership, control of possessions. However this result needs further study.

More than one under five children in household increased risk of illness. This may be increased number of children or absence of child spacing have effect on, food utilization and care for child by mother that resulted in increased risk of illness.

Children aged less than one year who were started on breastfed after 1 hour of birth were at lower risk for illness, but there seems no temporal relationship between study time and time of initiation of breast feeding and recall bias was very likely. Children exclusively breast fed for 6 or more months were at increased risk for illness Initiation of breast feeding within one hour of birth and breast feeding for 4-6 months is vital for health of under five children.(29). In this study, about 293(36.3%) children were put on breast milk within one hour of birth. Nationally, 52% of new born are put to breast milk within one hour of birth. In Amhara region, 32% and in SNNPR 62% are put on breast milk within one hour of birth (2).

About 137(19.9%) of children were breastfed for less than 6 months and 293(36.3%) were breastfed for less than 12 months. Fifty nine and half percent or 335 of children were started with supplementary feeding at 4-6 months of age. Nationally,14% of children are started on supplementary feeding too early and 68% too late (2). Some studies showed inappropriate feeding practices in combination with malnutrition might got synergy to bring about illness (4).

Stunted children were at lower risk of illness while underweight children were at increased risk of illness. Stunting shows past growth failure and is common after 24 months of age (29). while illness is has decreasing tendency with age(27). Checking independent association of each type of malnutrition with illness was necessary which showed stunting and underweight had association with illness. In this study there might be urban rural difference and inadequacy of sample size which makes conclusion to be difficult. Wasting was not risk for illness . This might be due to inadequacy of sample of wasted children, missed cases due to death. Unlike this study, the study done in Dabat showed that MUAC of less or equal to 13.5 cm. was associated with illness (5). Because measurement of MUAC lacks precision, doing weight and height for children with MUAC below 13.5cm is recommended (29)

Malnutrition, particularly in combination with ARI, diarrhea, malaria or measles is important cause of morbidity in children. It is closely linked to inappropriate feeding practices and food insecurity in many parts of the country (2). The study done in Jimma showed that early malnutrition makes to enduring malnutrition over the first 2 years (28). Cohort study in Jimma showed disadvantage of breastfeeding beyond 8 months of age on weight gain (28). On top of underlying malnutrition, water and sanitation might have a role in the illness. An analysis of ten longitudinal community based studies of children less than 5 years showed that being under weight conferred additional risks of mortality from infections diseases (4).

Children who were immunized BCG, Polio and measles were at increased risk of illness. When adjustment was made for age, children aged 1 year and above were protected from illness by measles immunization. Age specific vaccination coverage was 50-60% but the number of children within each category was small to lead to conclusion. In this survey, measles vaccination coverage was 50.1%. About 49.8% of children with illness were not vaccinated for measles. Five or more suspect cases or three or more immunoglobulin M(IGM) positive cases/ month are considered as

outbreak (16). The four reported cases in two weeks show that there was a potential for measles outbreak.

Sine malaria was found to be common illness, presence of bed net (and in most cases use) might have role in minimizing illness in general. Water safety had no association with illness. In the study done in Dabat, safety of water had no association with illness (5). Continuity of safe water also had no association with illness. The reason may be water handling practice from the site of the source till utilization, or adequacy of water rather than just safety of water. In Ethiopia the per capita drinking water cannot satisfy 50% of the minimum requirement (30).

Many studies have shown that water was found to be contaminated during transport and storage, even if it was from a treated and safe supply (21). About 43.4% of households had access to safe water for drinking (45% of urban households and 39.6% of rural households) but when continuity of supply was also seen, only 17.0 % of households get safe and continuous water supply for drinking (20.7% urban vs.7.3 % rural). The WMS 2004(except Gambella) showed nationally 35.9% of households get safe water (92.4% urban vs. 25.2% rural).Other reports showed national coverage for safe water for drinking is 30% (32). The MOH report for 1997 E.C. also show same figure and report for Gambella was not included. Therefore if continuity of water is considered, coverage in Gambella is unsatisfactory.

With regards to excreta disposal system, use of open field was found to beneficial than use of latrine but adjusting for urban and rural, use of open field for excreta disposal had no association with illness. In this study, sample of house holds with latrine were small which makes conclusion difficult. The study done in Dabat showed no association with illness (3). The study of childhood morbidity in Tigray showed using open pit latrine was significantly associated with increased incidence of the overall under five morbidity. This can be explained on the basis of the

disadvantage of open pit latrines as permanent breeding sites for flies and sources of bad odor (4).

About 38.1% of households have access to excreta disposal (52.2% of urban households and 4.1% of rural). About 61.9% of households use open field (47.8% of urban households and 95.9% of rural households). This shows the water and excreta disposal system in Gambella was not satisfactory particularly in rural.

The WMS showed at national level 68.9% of households use open field for excreta disposal (19.2% urban households and 78.2% of rural households). Other reports showed national, urban and rural coverage for latrines to be 15%, 68% and 7% respectively (32).

Hand washing before feeding child and after passing excreta was better in rural . This might be due to the fact that rural villages are located along Baro River which makes adequate water to be accessible. Use of soap back from passage of excreta was better in rural . This issue needs further study for clarification.
Children living in households where there was bed net were significantly protected from illness than children from households with no bed net. Since malaria and fever(assuming it to be proxy indicator of malaria) accounted nearly 203(50%) of overall illness, the presence of bed net which is treated at the right time and used by child is vital to decrease the overall burden of illness.With regard to malaria prevention, 83.8% (700) of households had bed net and 73.9% (516) of the bed nets were treated less than 6 months ago. This finding is higher than the national coverage of ITN which was 1 % (2).

Children whose mothers follow ANC were at risk of illness while children born in health facility were at lower risk of illness but when adjustment was made for age of child there was no difference in illness between those aged below 1 year and those above. About 68.4% of mothers had ever followed ANC during the recent pregnancy. More urban women followed ANC than rural (81.8% urban vs.36.5%

rural).This is similar to the study done in Gondar which showed that 45.7% of women had attended ANC at least once during last pregnancy and the percentage of urban ANC followers was about three times greater than mothers living in rural(79.1% vs.29.2%). This shows the coverage of Gambella is relatively better but the survey done in Gondar was in 2002 (31). In Gambella 204(38.1%) of ANC followers followed more than 4 times while 362(61.9%) less than 4 times showing drop out rate of about 33%.

Coverage for delivery in health facility is low 376(45.6%). There was also large urban rural inequity that 335(57.6%) for urban and 41(16.9%) for rural. The probability of delivery in health facility given a woman has followed ANC during the recent pregnancy at least once was 0.426 while if she has not followed ANC was 0.031. About 45.6% of mothers delivered the recent child in health facility (57.6% of urban vs.16.9% of rural). The study done in Gondar shows women who did not have any registered ANC visit were less likely to deliver in health facility. (31)

Continuity of use is important for services like EPI and ANC. Continuity of care seeking or service provision is a function of access, quality and utilization (2).
The prevalence of current FP users was 223(28.2%) and users among urban was 203(36.1%) and among rural only 20(9%). In 1997E.C. national contraceptive prevalence rate(CPR) was 24% and for Gambella 5.2% (1) Thus fertility reduction with this coverage, will be unlikely unless other factors which have role in fertility regulation are considered.

Uvulectomy, milk teeth extraction and prelacteal and prelacteal feeding significantly increase risk of illness. About 40% of children who undergone uvulectomy were underweight, 30% of children who undergone milk teeth extraction were underweight and 30.4% of children who given pre lacteal feeding were underweight .

The study done in Jimma also showed early malnutrition makes to enduring malnutrition over the first 2 years. The same study showed both uvulectomy and the extraction of milk teeth extraction reduce weight gain in infancy (28).

Whether the traditional practices might predispose child for illness perse or through loss of weight or some other factor needs further study. An IMCI baseline survey in one district showed 73% of children were given butter as a first feed (2). The study in Dabat Rural Health Project shows uvulectomy 93%, milk teeth extraction 53.3% (26). Another study in Jimma showed uvulectomy 35% and extraction of milk teeth 38% (28).

7. LIMITATIONS OF THE STUDY

7.1. Limitations

Like any other household survey the information collected through interview has subjectivity depending on the knowledge, attitude and perception about illness of the respondent and there was no validation of response to interview by physical examination or laboratory confirmation of illness and the discrepancy between response and physical examination or laboratory confirmation is unknown. There is also problem of recall bias.

Because of seasonality of illness and malnutrition the existing cases of illness and malnutrition may not be all cases because of death or recovery.

About 40.3% of household have more than one under five child and because usually younger child I ill, overestimation of overall illness might have occurred.

Determination of income of household may lack accuracy because they are affected by socioeconomic activities and seasonality.

Information on access, infrastructure and water handling procedures are lacking

Determination of age of child and mother may lack accuracy because birth certificate is not used always.

Limitations of anthropometrics like measurement errors and its failure to detect nutritional disturbance of short duration**.**

7.2. Strengths

The survey is community based which is very approximate to the reality

Employs quantitative methods which minimizes subjectivity

The study of household illness survey is for the first time in the region

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

1. The prevalence of households illness is high
2. Diarrhea, malaria, cough and fever are common households illnesses and there is regional variation with regard to prevalence and type of illness
3. The overall prevalence of malnutrition among under five children is high
4. Coverage for bed net is high (83.8%) also impregnation within 6 months is satisfactory (73.9%) and utilization by child is good (80%)
5. Initiation of breastfeeding within 1 hour of delivery is low (36.5%)
6. Breast feeding longer than the recommended period of 4-6 months is common- 63.4% breast feeding more than months
7. Initiation of supplementary feeding during the recommended period is not satisfactory (59.5%)
8. Coverage of FP use is low (28.8%) with significant difference between urban and rural (36.1% vs. 8.8%)
9. Coverage of ANC is satisfactory but continuity of use of service is poor with nearly 63.9% drop out
10. Delivery in health facility particularly in rural is poor (16.9%)
11. Child immunization coverage is not satisfactory
12. Access to excreta disposal is low (38.1%) with high difference between urban and rural (52.2% vs. 7.3%)
13. Coverage of access to safe water is 43.4% but when continuity is seen it is very low 17% (20.7% for urban vs. 7.3% for rural)
14. Traditional practices are common with uvulectomy 12.9%, milk teeth extraction 35.6% and prelacteal feeding 44.0%

8.2 Recommendations

1. Region specific guide line within the framework of national guideline on assessment and management of common child hood illnesses and malnutrition is necessary for training and management of health workers at local and community level, program implementation and evaluation

2. Behavioral Change Communication(BCC) on continued use of bed net and feeding practices is necessary

3. EPI, FP, ANC, delivery service utilization should be promoted and continuity of use should be strengthened in collaboration with respective stakeholders with special emphasis to the rural community

4. Enabling the community to safe and continuous supply of water and excreta disposal at households' level is necessary with particular emphasis to the rural

5. BCC on traditional mal practices should be strengthened in the local context and in collaboration with respective stake holders

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10. ANNEXES

ANNEX- 1

TABLE 1 DEMOGRAPHY AND SOCIAL INFRASTRUCTURE IN GAMBELLA SPECIAL WEREDA, 1998 E.C.

Population (Both Sexes)	Sex Ratio	Urban (%)	Under One (%)	Surviving Infants (%)	Under Five (%)	Female 15-49 (%)	Dependency Ratio (%)	Population Density Per km^2	Ave hou Size
240,394	103.5	18.0	2.9	3.1	15	26.8	66.7	9.1	4.5

TABLE- 2 Demography of Gambella special wereda, 1998 E.C.

CBR Per 1000	CDR Per 1000	RNI (%)	TFR	IMR Per 1000	CMR Per 1000	U5MR Per 1000	MALE LE	FEMALE LE
34.8	9.1	2.6	4.5	80	126.0	113.0	57.6	58.3

TABLE-3 Health infrastructure of Gambella special wereda,1998 E.C.

Hospital	BEDS	H. CENTER		H. STATION	
		MOH	OTHERS	MOH	OTHERS
1	96	4	4	27	8

TABLE-4 Pharmaceuticals of Gambella special wereda,1998 E.C.

Pharmacy	Drug shop	Rural Drug Vender
0	4	13

TABLE-5 Health human resources of Gambella special wereda, 1998 E.C.

Physicians	H.O.	Pharmacist	Nurses	Env. HW	Lab. Tech.	Radio grapher	Pharmacy Tech.	H.A.	FLHW	Special
6	15	0	248	11	12	0	0	42	0	0

TABLE-6 Population of Gambella special wereda,1997 E.C.

NAME OF THE WEREDA	NUMBER OF KEBELES	POPULATION
Jikawo	56	64,909
Akobo	38	28,856
Godere	29	42,370
Alwero openo	44	35,482
Gilo	31	32,737
Dima	18	27,165
Gambella	17	40,181
Total	233	271,700

Source- RHB

TABLE- 7 Population groups and selected social services of Gambella special wereda,1997 E.C.

POPULATION AND SOCIAL SERVICES	URBAN	RURAL	TOTAL
Population	30,322	9,859	40,181
Under Five	4,458	1,479	6,027
Under One	940	459	1,399
Hospital	1	0	1
HS/Clinic	2	6	8
H. Post	0	4	4
Drug Shop	1	0	1
Rural Drug Vender	6	0	6
High School	2	0	2
Elementary School	5	6	11

Source- RHB

TABLE-8 Demographic characteristics of kebeles,1997 E.C.

KEBELE	POPULATION	UNDER FIVE	UNDER ONE

01	8,867	1,330	275
02	4,346	652	135
03	5,780	867	179
04	5,781	867	179
05	5,548	832 / 4,548	172
Jewe	119	18	4
Abot	373	56	12
Iley	250	38	8
Pinkyo	3,264	490	101
Abol	1562	234	48
Pinymdi	714	107	22
Uchom	1,740	261	54
Opomiro	190	29	6
Aglak	200	30	6
Pirpingo	180	27	6
Solen	287	43	9
Bonga	980	147/1480	30
TOTAL	40181	6028	

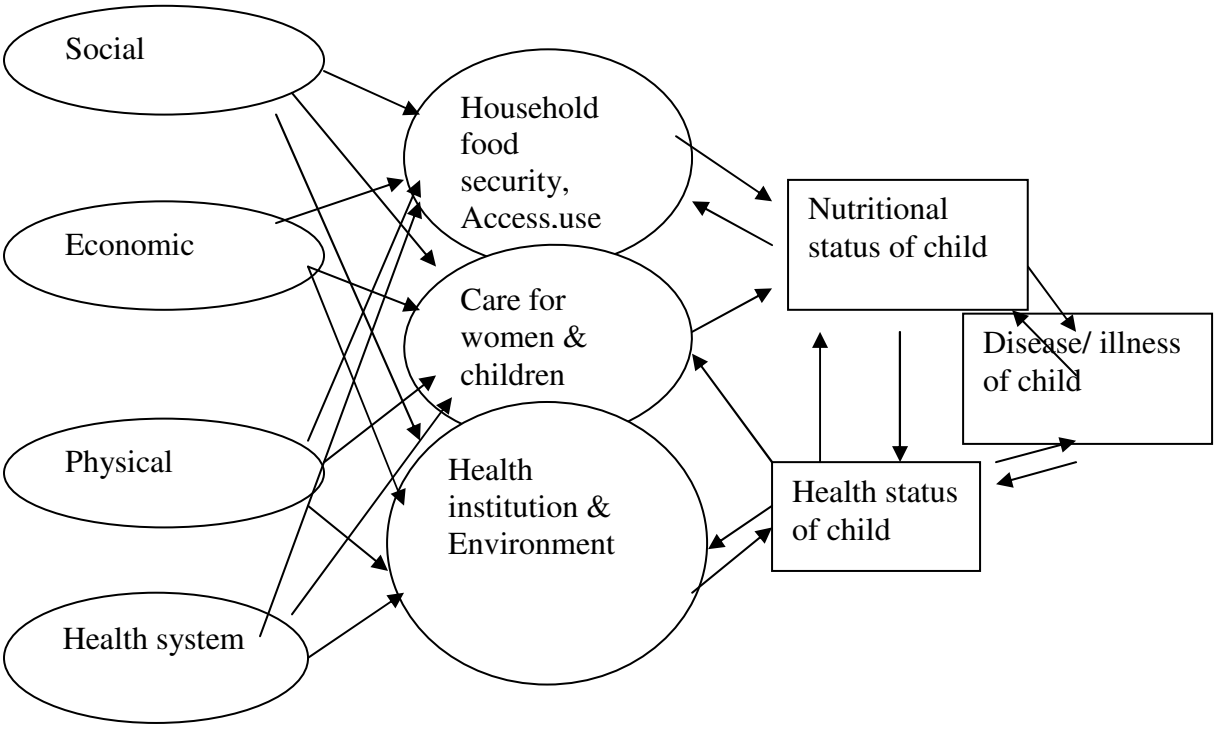
TABLE-9 Distribution of under five children in kebeles (clusters), 1998 E.C.

KEBELE	UNDER FIVE	CUMULATIVE FREQUENCY
01	1,330	1330
02	652	1982
03	867	2849
04	867	3716
05	832	4548
Jewe(6)	18	4556
Abot(7)	56	4622
Iley(8)	38	4660
Pinkyo(9)	490	5150
Abol(10)	234	5384
Pinymoli (11)	107	5491
Uchom(12)	261	5752
Opimiro(13)	29	5781
Aglak(14)	30	5811
Pirpingo(15)	27	5838
Solen(16)	43	5881
Bonga(17)	147	6028

TABLE- 10 Under five children in Gambella special wereda, 1998 E.C.

KEBELE	UNDER FIVE CHILDREN IN KEBELE	SAMPLE BASED ON PPS	ACTUAL SAMPLE COLLECTED
01	1330	179	169
02	652	88	89
03	867	117	107
04	867	117	120
05	832	112	105
06(JEWE)	18	3	6
07 (ABOT)	56	8	10
08 (ILEY)	38	5	20
09 (PINKYO)	490	66	64
10 (ABOL)	234	32	30
11 (PINMOLI)	107	14	20
12 (UCHOM)	261	35	34
13 (OPIMIRO)	29	4	10
14 (AGLAK)	30	4	5
15 (PIRPINGO)	27	4	20
16 (SOLEN)	43	6	8
17 (BONGA)	147	20	20
TOTAL	6028	814	837

ANNEX 2 CONCEPTUAL FRAMEWORKS FOR THIS STUDY



HOUSEHOLD PREVALENCE OF ILLNESSES AND ITS DETERMINANTS AMOUNG UNDER FIVE IN GAMBELLA WEREDA, 1998 E.C.
QUESTIONNAIRE AND DATA COLLECTION FORMAT

I. GENERAL INFORMATION ABOUT HOUSEHOLD AND DATA COLLECTOR

Record No._____
Name/code of interviewer_____

Date of interview _____

Residence 1. Urban 2. Rural
Kebele/cluster _____

Cluster No. _____
Household No._____

II. SOCIODEMOGRAPHIC CHARACTERISTICS OF MOTHER/CAREGIVER

A. Age (years) 1. < 15 2. 15 - 19 3. 20-24 4.25-29 5.30-34
6. 35-39 7.40-44 8.45-49 9. 49+ 10. I DONOT KNOW
D. Marital status 1. Single 2. Married 3.Divorced
4. Widowed 5. Other_____
E. If married, in polygamy? 1. Yes 2.No
G. Ethnicity 1. Anyuak 2. Nuer 3. Mezenger
4. Komo 5. Opo 6. Oromo
7. Amhara 8. Kambata 9. Other_____
H. Religion 1. Protestant 2. Orthodox 3. Muslim
4. Pagan 5.Other_____
I. Educational status 1.Illiterate 2.Read & write 3. 1- 6 4. 7-8
5. 9-12 6. >12 7. Other_____
I. Occupation 1.Housewife 2. Govt. employee 3. Trader
4. Farmer 5. Jobless 6.Other_____
J. Income (birr per month) 1. <50 2.50-100 3.100-150
4. 150-200 5.200-250 6. 250 - 300 7. >= 300
8. Income in kind_____ quintals per year (specify type)
K. Age at first marriage (yr)
1. < 15 2. 15- 19 3. 20 - 24 4. 25+ 5. I DONOT KNOW
L. Age at first delivery (yr)
1. <15 2.15-19 3.20-24 4.25+ 5. I DONOT KNOW
M. Fertility (births-persons) 1. 1-4 2.5-9 3.10^{+}
N. Household size 1.2-4 2.5-7 3.8-10 4.>10
O. Under 5 children in household
1.1 2.2 3.3 4.4 5.5 6. Other(specify) _____

III. CHILD IDENTIFICATION, HOUSEHOLD ILLNESS & HEALTH RELATED BEHAVIOR TO ILL CHILD

A. Name of child

B. Age of child (months) 1. 0- 3 2. 4-6 3.7-11 4.12-23
5. 24-35 6.36-47 7. 48- 59 8. I DONOT KNOW

C. Sex of child 1. M 2. F

D. Did ---experience any illness in the past two weeks? 1. Y 2. N

E. If yes, what do you think it is? _____(specify)

F. If yes did you go for consultation or health care of any type? 1. Y 2. N

G. If yes, where did you first go for advice or treatment?

1. Health Facility (hospital, HC, HP, PVO Clinic, Other HF)

2. Other Source (Traditional practitioner, shop, pharmacy, community distributor,

friend/relative, other_____)

IV. ABOUT BED NET

A. Do you have any bed nets in your house?

1. Yes 2. No

B. If yes to (A), is the net treated with medications? 1. Y 2. N 3.I do not know

C. If yes to (B), how many months ago was the net treated? _____

D. If yes to (A), who slept under it last night?

1. Child 2.Myself 3.Husband/partner 4.Other (specify) _____

V. INFANT/CHILD FEEDING

A. How long after delivery was child put to breast? (Hours)_____

B. What was given to child before breast? _____

C. Did you ever breast fed? 1. Yes 2.No

D. Are you currently breasted feeding? 1. Yes 2. No

E. If yes to (A or B), for how long did you breast feed? (In months)

1. <4 2. 4-6 3. 7-12 4. >=12 5. I do not know

F. Have you started to give any drink other than breast milk and/or food? 1. Yes 2. No

G. If yes to (F), at what age did you start giving additional food other than breast milk? (in months)

1. <4m 2. 4-6m 3. 7-12 4.>=12 5. I do not know

H. If yes to (G), who feeds the child?

1. Him/herself 2.Elder siblings 3. Parents 4. Other (specify)_____

VI. CHILDHOOD IMMUNIZATION

A. Do you have a card where -------'s vaccination are written?

1. Yes (seen by data collector) 2.Not available /lost/misplaced

3. Never had a card 3. I don't know

B. If yes, & seen by data collector

COPY	DD/MM/YR
1 .BCG	_____
2. Polio 0 (at birth)	_____
3. Polio 1	_____

4. Polio 2 _____

5. Polio 3 _____

6. DPT 1 _____
7. DPT 2 _____

8. DPT 3 _____

9. Measles _____

C. If no card did ---------- receive any vaccination including National Immunization Days?

1. Yes 2. No 3. I do not know

D. No card, Please tell me if any of the following?

D-1. BCG vaccine, injection on arm, scar seen?

1. Yes 2. No 3. I do not know

D-2. Polio vaccine, drop in mouth 1. Yes 2. No 3. I do not know

D-3. If yes to (D-2), when? 1. Just after birth 2. Later(more than 2 weeks)

D- 4. DPT injection on buttock or high (And some times same time with polio drops)?

1. Yes 2. No 3. I do not know

D-5. If yes to (D-4), how many times? 1.1 2. 2 3. 3 4. I do not know

D-5. Any injection to prevent measles? 1. Yes 2. No 3. I do not know

VII. HEALTH RELATED TRADITIONAL PRACTICES

A. Was this child had Uvulectomy? 1. Y 2. N 3. I do not know

B. Was removal of "false teeth" done for the child? 1. Y 2.N 3. I do not know

VIII. MATERNAL HEALTH SERVICE UTILIZATION

A. Did you have an antenatal care care? 1. Yes 2. No 3. I do not know

B. If yes to (A), how many times? _____

C. Where did you deliver the child?

1. Home 2. HI 3. TBA 4. TTBA 5. Other_____

D. Are you using any FP methods currently? 1. Yes 2. NO

E. Are you using of the following FP methods?

1. Pills 2. Depo/ inject able 3.Norplant 4. Intrauterine contraceptive device (IUD)

5. Condoms 6. Other

IX. ANTHROPOMETRY

A. Child weight (in kg. 12-59 months of age) _____

B. Child height/length (in cm. 12-59 months of age) _____

C. Mid upper arm circumference (cm above 12 months) _____

.

X. WATER AND EXCRETA DISPOSAL

A. What is the main source of water for drinking for the family?

_____

B. If the answer to (A) is well or spring, 1. Protected 2. Unprotected

C. Do you get your drinking water throughout the year or can you get when getting water is less likely?

1. Yes 2. No 3. I do not know

D. Do you wash hands before preparing meals? 1. Y, always 2. Y, sometimes 3. Not at all

E. Do you wash hands before feeding child? 1. Y, always 2. Y, sometimes 3. Not at all

F. Do you wash hands after using toilet? 1. Y, always 2. Y, sometimes 3. Not at all

G. Do you use soap while washing? 1. Y, always 2. Y, sometimes 3. Not at all

H. What kind of toilet do most member of your house hold use?

1. Flush 2. Pit /traditional /pit/ VIP 3. No facility or Penfield

4. Other (specify) _____

I. Do you share facility with other households?

1. Yes 2. No

Supervisor's code _____ Signature_____