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STRENGTHENING COMMUNITY-BASED PRIMARY HEALTH CARE TO INTERNALLY DISPLACED PERSONS AND VULNERABLE POPULATIONS OF BURMA

IMPACT ASSESSMENT SURVEY REPORT

BACK PACK HEALTH WORKER TEAM

May 2024

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ACKNOWLEDGEMENTS

The BPHWT would like to thank all donors, partner organizations, and Ethnic Health Organizations and Ethnic Health Workers for the continuous commitment for strengthening Community-based Primary Health Care to Internally Displaced Persons and Vulnerable Populations in ethnic of Burma/Myanmar. The BPHWT takes a capacity building approach to strengthening the ethnic and community-based health care system in Burma. It builds on BPHWT's 26 years of experience delivering context-adapted, basic primary health care to vulnerable communities. It empowers communities to manage their own health care through consultation and utilization of communities as their own health workforce. It employs quality improvement of health services through routine monitoring and periodic impact assessments and health system analysis.

First, the BPHWT would like to express its gratitude to Dr. Aung Kay Tu (, Thet Htar Swe and Nang Snow (Burma Relief Center – BRC) – Master of Public Health graduated students from Mahidol University for providing technical support including assisting to review the survey questionnaires, providing training on data collection, and data analysis and writing the report. Second, the BPHWT also would like to thank the individual who provided comments and input to the survey questionnaires, the data collection, analysis and drafting of the report. Third, the BPHWT also acknowledges the survey team members who travelled to the target villages throughout the region to collect data. Finally, the BPHWT is sincerely thankful to the community members who were willing to respond to the questions and share their experiences that are most valuable for this report.

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
ARI	Acute Respiratory Infection
BPHWT	Back Pack Health Worker Team
CBO	Community – Based Organization
CHEPP	Community Health Education and Prevention Program
CHW	Community Health Worker
CSOs	Civil Society Organization
DMPA	Depot Medroxyprogesterone Acetate
DOT	Directly Observed Therapy
ECBHOs	Ethnic Community Based Health Organization
ERO	Ethnic Resistance Organization
EHO	Ethnic Health Organization
EPI	Expanded Program on Immunizations
EBRMS	Eastern Burma Retrospective Mortality Survey
GAM	Global Acute Malnutrition
FGD	Focus Group Discussion
GHF	Government Health Facility
HID	Health Information and Documentation
HISWG	Health Information System Working Group
IAS	Impact Assessment Survey
IDP	Internally Displaced Person
IMR	Infant Mortality Rate
OPV	Oral Polio Vaccination
MCP	Medical Care Program
MCHP	Maternal and Child Healthcare Program
MUAC	Mid-Upper Arm Circumference
NMR	Neonatal Mortality Rate
NTD	Neglected Tropical Diseases
PPS	Population Proportional to Size
SAC	State Administration Council
SPSS	Statistical Package for the Social Science
TTBA	Trained Traditional Birth Attendant
U5MR	Under-5 Mortality Rate
VHV	Village Health Volunteer
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

1. EXECUTIVE SUMMARY

This report summarizes the results of community-based health survey, which covered 16 townships across 7 areas, 1,601 households in ethnic areas of Myanmar/Burma. The survey results showed the health status of the Back Pack Health Worker Team (BPHWT) implementation sites in remote and conflict-affected ethnic areas Burma. The main purpose of this survey was to constantly assess the effectiveness and impact of the BPHWT's programs. The objectives were to identify the current situation of BPHWT implementation in each state and region and to assess the success of the programs; and to collect data against existing BPHWT health indicators.

During the decades of active conflict in the ethnic states, many ethnic groups established their own community-based primary health care service provision structures. Their service delivery models include a comprehensive 'package' of medical services comprising treatment of common diseases, war casualty management, reproductive and child health services, community health education, and water, sanitation and hygiene programs. Services are provided through a mix of mobile medical teams and stationary clinics. The health workers have been trained to implement programs in remote areas under difficult conditions. These ethnic and community-based health organizations are also working to standardize health data through joint data collection methods and health information management systems (1).

Inception of the military coup in Burma, the State Administration Council (SAC) troops escalated their operations at ethnic areas. Those operations were continuous until 2024 and utilized not only shelling but also airstrikes in their operation in most ethnic areas. Thus, the EROs and other ally arm groups protected their community and areas so fighting between the SAC's troops and the EROs was intensive. In this reason, station clinics services were suspension and that become mobile healthcare services; however, other station clinic health care services were available occasionally. Furthermore, conveying medicine, transportation, and communication address with difficulty was due to the SAC' military checkpoints and battles. Due to this implication, many local people become IDPs; likewise, health workers provided health care services among IDPs. Fortunately, other station clinics and mobile teams existed in ethnic administration areas and not active conflict areas; thus, those can continuous primary healthcare services (1).

Some health outcomes in the region have improved, though it is obvious that some challenges remain. Mortality rates among infants and children under 5 in eastern Burma are higher than national data in Burma (2). The three main causes of death across all age groups are preventable diseases such as diarrhea and fever related causes.

In the Maternal and Child Healthcare Program of BPHWT, capacity building is delivered through the six-monthly Maternal and Child Healthcare Refresher Training Course attended by MCH supervisors, 10-day TTBA training course and 2-day TTBA workshops every six months in field areas (3). The BPHWT has had specific criteria to recruit new TTBAs: TTBAs must have had the experience of delivering at least five babies and attended TTBA Workshops. The TTBAs are at the forefront for ensuring the sustainability of local reproductive healthcare. It is thus important that the skills of TTBAs are improved so they can perform safe and aseptic deliveries and provide proper maternal and reproductive healthcare to these vulnerable communities. Among women surveyed, 61.5% of women delivered their last child with the participation of a trained traditional birth attendant (TTBA). 32.8 % of pregnant women received four or more antenatal care visits as recommended by the World Health Organization. Only 29 % of reproductive women who do not have desire to have more children used family planning methods, and contraceptive injection was the most common method. Regarding Water, sanitation, and hygiene (WASH), 41.1% of households consumed unpurified water in the last 24 hours, and gravity flow is the main source of drinking water among surveyed households and followed by open wells with 22%.

Ethnic and community-based health service providers are responding strategically to health needs at the community level but increases in support are needed in order to expand their reach and to address the chronic health crisis in the region (4). It is crucial to formally recognize and increase international support, especially during this crisis and critical transition period, for the existing ethnic and community-based health organizations that have a unique ability to identify, understand, and fulfill the needs of vulnerable communities who have been marginalized for decades.

2. CONTEXT

2.1 OVERVIEW AND SUMMARY OF THE BPHWT

The Back Pack Health Worker Team (BPHWT) is a community-based organization that has been providing primary health care for over twenty years in the conflict and rural areas of Burma, where access to quality primary healthcare is otherwise unattainable. The BPHWT provides a range of medical care, community health education and prevention, and maternal and child healthcare services to internally displaced persons (IDPs) and vulnerable community members in Burma (3).

Doctors and health workers from Karen, Karenni, and Mon areas established the BPHWT in 1998. The organization initially included 32 teams, consisting of 120 health workers. Over the years and in response to increasing demand, the number of teams has gradually increased. The BPHWT consisted of 114 teams, with each team being comprised of three to five trained health workers who train and collaborate with five to ten village health workers/volunteers and five to ten trained traditional birth attendants; this network of mobile health workers with advanced skills and stationary health workers with basic skills ensures that community members have consistent access to essential primary healthcare services. The PHCs provide promotive, preventative, curative health care, and a secure facility to store medicine and medical supplies/equipment (3).

BPHWT Clinic

The BPHWT teams target displaced and vulnerable communities with no other access to healthcare in Karen, Karenni, Mon, Arakan, Chin, Kachin and Shan States, and Pegu, Sagaing and Tenasserim Regions. The teams deliver a wide range of healthcare programs to a target population of IDPs and vulnerable people are 300,082. The BPHWT aims to empower and equip people with the skills and knowledge necessary to manage and address their own health problems, while working towards the long-term sustainable development of a primary healthcare infrastructure in Burma (1).

Since the Myanmar military coup in February 2021, there are continued fighting between Ethnic Armed Organizations (EROs) and the State Administrative Council (SAC) troops. Moreover, the SAC used airstrikes and shelling to the communities so many of the villagers become internal displaced persons. According to the IDPs situation, there is no access to safe drinking water and supplies. However, the BPHWT will prepare emergency medical supplies and immediately take actions in cases of emergency humanitarian situations as outlined in the BPHWT constitution, such as natural disasters, epidemics, pandemic, armed conflicts, and famine. In addition, the BPHWT installed emergency latrine and delivered water filtration and water storage buckets to the IDPs areas (1).

The BPHWT continued to work with communities in its target areas to implement its three main health programs, namely the Medical Care Program (MCP), Maternal and Child Healthcare Program (MCHP), and Community Health Education and Prevention Program (CHEPP). The BPHWT encourages and employs a community-managed and community-based approach where health services are requested by communities and the health workers are chosen by, live in, and work for their respective communities (1).

2.2 GOVERNANCE

As depicted in the Organizational Structure, the Leading Committee elected by the BPHWT members governs the BPHWT. The Leading Committee is comprised of 17 members who are elected for a three-year term. The Leading Committee appointed members of the Executive Board, which are required to meet bi-monthly and/or emergency meeting as needed and make decisions on current issues faced by the BPHWT. The BPHWT has a range of organizational documents that guide leadership, management, healthcare delivery, health information systems and human resources (1)

2.3 THE BPHWT CONSTITUTION

The Constitution provides the framework for the operation of the BPHWT through thirteen articles that define the organization's name, vision, mission statement, organizational identification, symbol, goals, objectives, policies and principles, actions and implementation, monitoring and evaluation, membership, election of the Leading Committee, amendments to the Constitution and organizational restructuring, employment of consultants and job descriptions for positions (3).

2.4 FINALCIAL MANAGEMENT AND ACCOUNTABILITY

The BPHWT has developed policies and procedures guiding the Leading Committee, Executive Board, Program coordinators, office staffs, and field health workers in terms of financial management and accountability, the production of annual financial reports, and the requirement for an annual independent audit. These documents establish the financial records to be kept; the management of bank accounts; the procedures for cash withdrawals, deposits, transfers, receipts, disbursements and general administration funds; and the liquidation of cash assets. The BPHWT has also developed policies covering payments for lodging, travel and honoraria for services rendered (1).

2.5 HEALTH WORKFORCE

The table below depicts the current targets and actual percentage of women across organizational tiers. To date, the BPHWT meets or exceeds all gender equity targets for the various organizational tiers (1).

Table 1 : Human resources in BPHWT

Title	M	F	Total
Leading Committee/ Executive Board	18	8	26
Office/program Staff	9	15	24
Field Management Workers	35	35	70
Field Health Workers	211	321	532
VHVs/VHWs	106	222	328
TBAs/TTBAs	64	679	743
Total Workforce	**443**	**1,280**	**1,723**

2.6 HEALTH INFORMATION SYSTEMS

The BPHWT collects health information, documents evidence of the health situation and assesses the community needs in Burma. This integrated program also plays a role in monitoring and evaluation of the programs. The BPHWT assesses health needs annually and conducts an impact assessment survey every four years, to compare and evaluate the annual program outcomes. Documentation includes photographs, website maintenance, videos and written reports (1).

The BPHWT builds the capacity of its staff by providing training in indicator development; data form design, data management, and data analysis as well as public health knowledge in order to conduct regular monitoring and evaluation activities. Additionally, as staff becomes more evidence-based driven, additional skills are needed for program staff and the HID Coordinator to understand how to determine their data needs and then how to interpret and use it. The village health workers (VHWs) and health workers will ensure the information is culturally sensitive and appropriate to the conditions of the IDPs. Existing information and materials from the government and other groups on these topics will be reproduced and provided. And we also work together with INGOs/NGOs, universities, and professionals for health information system strengthening (3).

2.7 PROGRAMS OF BACK PACK HEALTH WORKER TEAM

The BPHWT delivers three programs: Medical Care Program (MCP), Community Health Education and Prevention Program (CHEPP), and Maternal and Child Healthcare Program (MCHP). Integrated within and bridging across these three health programs and activities for capacity building, health information systems and documentation, and monitoring and evaluation. The BPHWT provided healthcare in 21 field areas, through 114 BPHWT teams, to a target population of 300,082 people. There are currently 1,723 (1,280 women and 443 men) members of the BPHWT primary healthcare system living and working in Burma: 532 (321 women and 211 men) health workers, 743 (679 women and 64 men) Traditional Birth Attendants / Trained Traditional Birth Attendants (TBAs/TTBAs) and 328 (106 men and 222 women) village health volunteers/village health workers (VHVs/VHWs).

A. MEDICAL CARE PROGRAM (MCP)

The Medical Care Program (MCP) aims to reduce mortality and morbidity rates by diagnosing and treating common illnesses and injuries, including war injuries. The MCP will continue providing essential medicines for common diseases in the target areas, strengthening patient referral systems, disease outbreak response and health workers' skills and knowledge improvement by strengthening technical performance assessment processes at the field level and dissemination of standard operation procedure (SOP) to the field team.

B. COMMUNITY HEALTH EDUCATION AND PREVENTION PROGRAM (CHEPP)

Community Health Education and Prevention Program focuses on disease prevention, health promotion to empower and support local people, through education and preventive health measures. The program will continue to improve water and sanitation systems in the community to reduce water-borne diseases, educate students and communities about health, reduce incidences of malnutrition and worm infestation and improve networking among community health organizations. BPHWT will conduct Village Health Workshops for community members to gain improved knowledge of primary health care issues. The participants will be from a wide variety of backgrounds and community groups, including shopkeepers, religious leaders, members of women organizations, and village heads. This wide and varied participation increases the likelihood of knowledge spreading and reaching all levels and different parts of the community.

School health activity in Dooplaya area

C. MATERNAL AND CHILD HEALTHCARE PROGRAM (MCHP)

The program aims to improve maternal and child health by training and utilizing an extensive network of community-selected Traditional Birth Attendants (TBAs). BPHWT trains TBAs in antenatal and postnatal care, normal delivery, and recognition of danger signs during pregnancy and childbirth. The program will continue to improve maternal and child health care (de-worming medication, folic acid, vitamin A, and iron supplements to women during pregnancy), improve knowledge and skills of TBAs and MCHP Supervisors, encourage positive community attitudes towards and utilization of family planning and provide delivery records.

D. MONITORING AND EVALUATION

The BPHWT undertakes a range of monitoring and evaluation activities, some of which are conducted by external consultants or organizations, to constantly assess the effectiveness and impact of our programs. Internally, our monitoring and evaluation covers three areas: program management, program development and program effectiveness. Every six months, field in-charges submit caseload data from the field logbooks to the program coordinators and HID staff at the BPHWT main office, which is later analyzed and presented in the general meeting that is held every six months (1). In addition to reviewing caseload information, the participants also discuss challenges, discuss treatment protocol updates and make decisions and changes to programs. In order to monitor program management, the health workers' performance is regularly reviewed. Additionally, field in-charges regularly meet with village leaders and community members to get feedback on programs and to monitor their local health needs. Lastly, the BPHWT carries out an Impact Assessment Survey, a Health Worker Performance Assessment, and Trained Traditional Birth Attendant (TTBA) Assessment every two years using clusters of randomly selected households in most field areas. This survey assists the BPHWT in reviewing program activities, evaluating program effectiveness and planning for future activities. The BPHWT has been coordinating with HISWG for EBRMS every four years (1). Regarding our internal monitoring, the BPHWT is also regularly evaluated by donors and independent external consultants. And also, we have external financial auditing once a year. The Leading Committee members, Executive Board members, program coordinators, and M&E staff often visit the targeted field areas and talk to village health committees and communities to see the effectiveness of the programs (1).

3. METHODOLOGY

3.1 SURVEY DESIGN

The impact assessment survey was conducted in Karen(N), Karen (S), Karenni, Mon, Kachin, Pa Oh and Ta'ang areas. The primary objective of the study was to assess the impact of the BPHWT services, delivered to internally displaced persons (IDPs) and other remote populations. The survey was conducted from Oct 2023 to May 2024.

3.2 SAMPLING METHOD

Surveys were conducted using two-stage cluster sampling and data were collected from a total of 1,601 households. The sampling frame of 28,984 people (5314 households) was constructed using village-level population lists provided by ethnic and community-based health organizations that had been updated within the past year. Geographic boundaries were drawn based on service (or catchment) areas for each health organization. The stratified, two-stage household sampling protocol was designed to facilitate estimation of under-five mortality rates in each service area (stratum). In the first stage, clusters were selected using population proportional to size (PPS); in the second stage, proximity sampling was used to select 30 households for each cluster. A household was defined as a group of people who live under the same roof for two or more months and share meals.

Surveyors examining a map of the planned survey area

3.3 DATA COLLECTION

A surveyor collecting data from household by using a survey questionnaire

The survey instrument was originally written in English, translated into Burmese. The survey asked respondents to enumerate the age, sex, and in/out-migration of all household members and give the age and perceived cause of death of all who had died in the household in the past year with the exception of miscarriages, abortions, and stillbirths. The acute malnutrition was assessed by measuring mid-upper arm circumference (MUAC) of children 6-59 months of age. Interviewers requested that the head of household (male or female) respond to questions; if the head of household was unavailable, respondents were selected in the following descending order of priority: a woman of reproductive age with the youngest child under five in the household; women of reproductive age currently pregnant; and oldest woman of reproductive age. The interviewers asked reproductive health questions of all women of reproductive age in the household who either had a child under five or were pregnant at the time of the survey. A verbal informed consent process was undertaken with each household. When cases of malnutrition were uncovered, or when respondents expressed distress resulting from questions asked, surveyors referred affected individuals to community leaders and local clinics to seek necessary care.

3.4 DATA ANALYSIS

After data collection, the Statistical Package for the Social Science (SPSS) version 25 was used to code, input, and analyze the data. Data cleaning was done before subjecting it to analysis.

The under- 5 mortality rates (U5MR) and infant mortality rates (IMR) were calculated as a ratio of deaths per one thousand live births using standard approaches. The commonly used MUAC cutoffs for malnutrition were used to categorize children with severe malnutrition (<11.5 cm), moderate malnutrition (11.5 to <12.5 cm), and normal (≥12.5 cm).

3.5 LIMITATION

Some questions directed at respondents were subject to potential to recall bias, especially regarding mortality outcomes. Since reports of mortality cases and causes of death were reliant on information from surviving household members rather than physician-certified assessments, there's a possibility of misclassification of causes of death.

Despite the efforts of mobile teams from the team to provide services in highly insecure areas, obtaining and returning data from some particularly dangerous regions proved unfeasible. It's plausible that the health conditions in these areas are more severe than those where data collection was possible. However, due to the lack of data from these regions, it's not feasible to definitively ascertain differences between surveyed areas.

4. SURVEY FINDINGS AND DISCUSSION

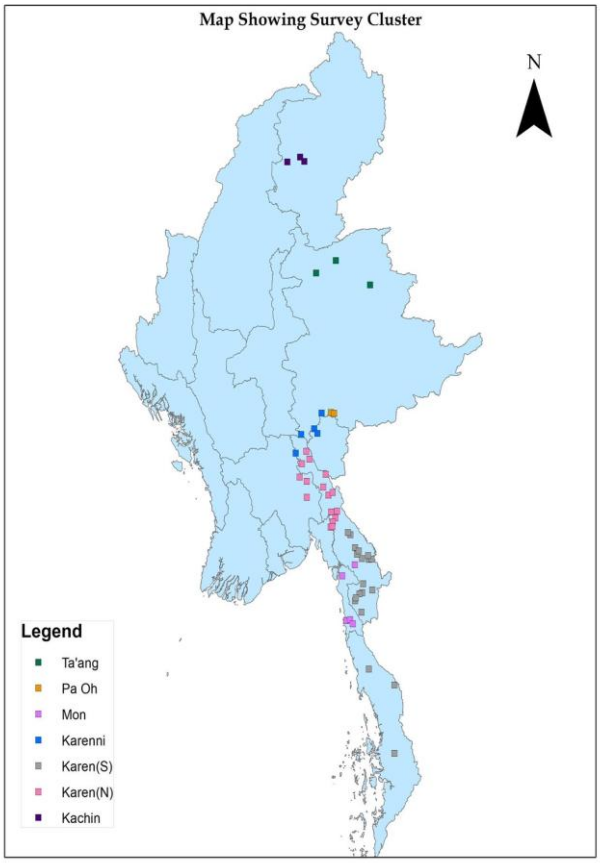
4.1 SURVEY AREAS

The sample analyzed included 54 clusters across 7 areas, with each cluster covering 30 households in the village. A total of 8,336 people were enumerated in 1,601 households, yielding an overall response rate of 98.6%. The areas surveyed were Moulamein and Yee in Mon, Kachin in Kachin, Kler Lwee Htoo, Papun, Taungoo, and Thaton in Karen (North), Dooplaya, Kawkareik, Mergue/Tavoy, Pa An, and Win Yee in Karen (South), Kayah and Kayan in Karenni, Pa Oh in Pa Oh, and Palaung in the Ta'ang area.

Table 2: Survey Area

Areas	Number of Cluster	Household Population	Percent
Mon	5	566	7%
Kachin	3	491	6%
Karen(N)	17	2857	34%
Karen(S)	19	3020	36%
Karenni	5	698	8%
Pa Oh	2	256	3%
Ta'ang	3	448	5%
Grand Total	**54**	**8336**	

Figure 1: Survey Map



KEY INDICATORS

- The nearly equal representation of males and females, with approximately 48% of male and 52% female, suggests a balanced gender distribution indicative of equitable demographics.
- Diverse age representation includes a significant portion aged 5 to 14 years (26.2%), with notable groups 15 to 24 years (15.7%), 25-34 years (15.6%) and under 5 years (14.7%).

Table 3 : Surveys returned

Number of clusters sampled	54
Total households sampled	1,601
Total consenting households	1,578
Total households refusing to participate	23
Total population in consenting households	8,336
Mean household size	5.2
Minimum household size	1
Medium household size	5
Maximum household size	14
Overall response rate	98.6%

4.2 DEMOGRAPHIC

The gender distribution reveals a balanced representation within the population under study. The data indicates that there is 48% male, while females account for 52% of the total population. Diverse age representation including reproductive aged group (46.1 %), 5 to 14 years (26.2%), and under 5 years (14.7%) emphasizing the importance of understanding age demographics for effective targeted interventions. Mean household size was 5.2 persons.

Table 4 : Characteristics of the respondents

Characteristics (N = 8,336)	Number	Percent
Gender		
Male	4,004	48 %
Female	4,332	52 %
Age		
Under 5 years	1,223	14.7 %
5 - 14 years	2,181	26.2 %
15-49 years	3,846	46.1 %
50 years and above	1,086	13.0 %

The demographic characteristics of the surveyed population are represented by the population pyramid above. This pyramid comprises two bar graphs, with males represented on the left and females on the right. The pyramid takes on a triangular shape, characterized by a broad base tapering swiftly upwards. This indicates a high birth rate, particularly among children, coupled with a relatively short life expectancy. Such a distribution pattern is commonly observed in less developed nations and in regions where access to essential healthcare services, notably preventive healthcare, reproductive health, and sanitation, is limited or absent. Overall, the gender distribution is nearly balanced, with a slight predominance of females.

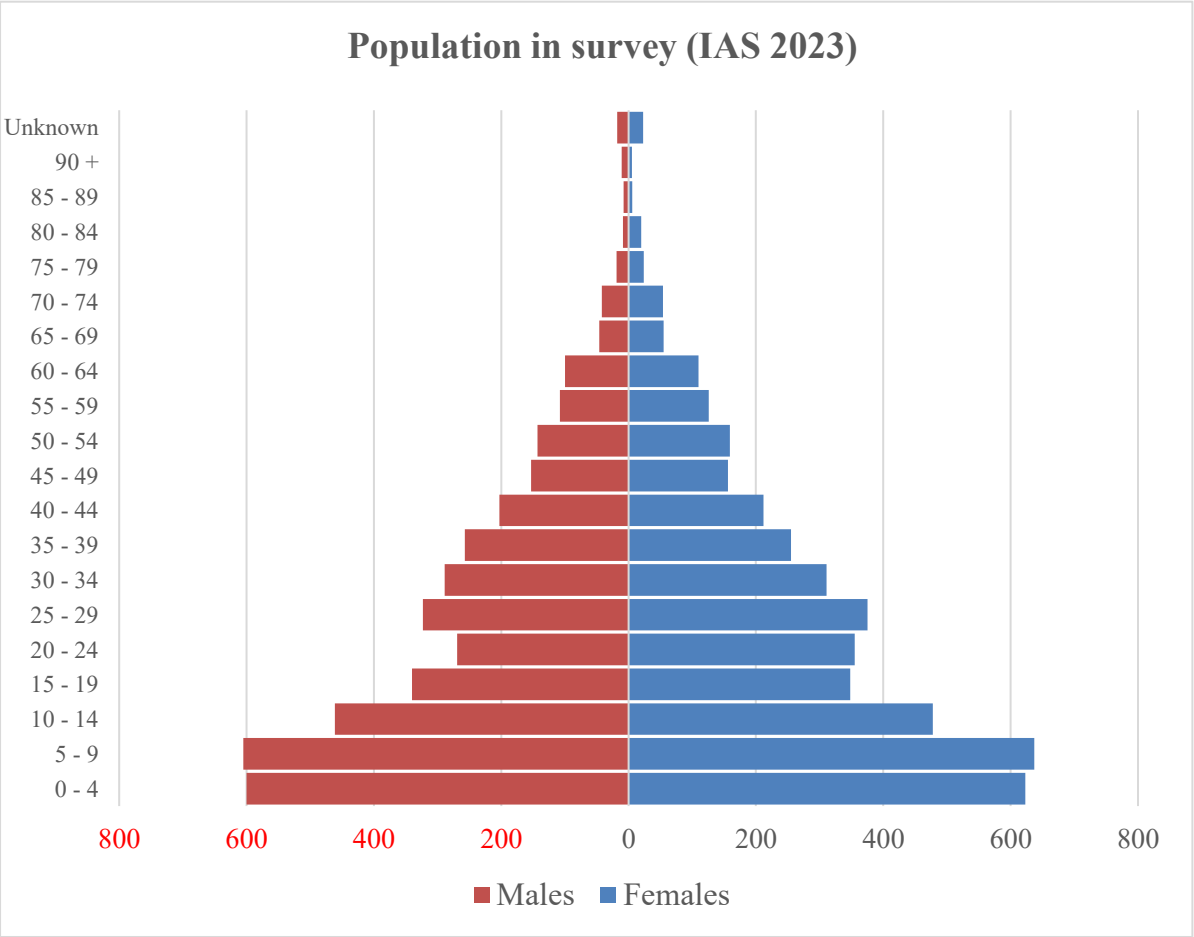


Figure 2 : Population pyramid in IAS 2023

4.3 WATER, SANITATION AND HYGIENE

KEY INDICATORS

- 41.1% of households consumed unpurified water in last 24 hours.
- 88.1 % of households get drinking water by walking within 15 Mins.
- Gravity flow is the main source of drinking water among surveyed households and followed by open well with 22%.
- 57.7% of households reported that there are latrines in their households.

Safe WASH is crucial to human health and well-being. Safe WASH is not only a prerequisite to health, but contributes to livelihoods, school attendance and dignity and helps to create resilient communities living in healthy environments. Inadequate or unsafe WASH may cause disease through a range of interrelated transmission pathways, which include among others:

- ingestion of water that is contaminated with faeces or chemicals
- inadequate personal hygiene which may be linked to lack of water
- contact with pathogen-containing water
- proximity to water bodies where disease vectors proliferate.

Drinking unsafe water impairs health through illnesses such as diarrhoea, and untreated excreta contaminates groundwaters and surface waters used for drinking-water, irrigation, bathing and household purposes. Chemical contamination of water continues to pose a health burden, whether natural in origin such as arsenic and fluoride, or anthropogenic such as nitrate. Safe and sufficient WASH plays a key role in preventing numerous NTDs such as trachoma, soil-transmitted helminths and schistosomiasis. Diarrhoeal deaths as a result of inadequate WASH were reduced by half during the Millennium Development Goal (MDG) period (1990–2015), with the significant progress on water and sanitation provision playing a key role. Evidence suggests that improving service levels towards safely managed drinking-water or sanitation such as regulated piped water or connections to sewers with wastewater treatment can dramatically improve health by reducing diarrhoeal disease deaths (14).

Health workers and villagers constructing a gravity flow in Pa An area

To improve water and sanitation systems in the community, BPHWT provides construction community latrines, installing of gravity flow water systems and shallow well water systems, providing water filtration, and conducting WASH awareness workshops. The Water and Sanitation Sub-Program in the team provides health promotion through access to safety managed drinking water supplies and sanitation, waste management, good hygiene behaviors and gravity-flow water systems to communities, as well as prevent and reduce waterborne diseases.

The School Health Sub-Program is an aspect of the CHEPP, which uses a child-to-parent model to influence the health awareness, behavior, and practices of the student, but also that of the parent through the student. The students are also provided with personal hygiene kits, which include toothpaste, toothbrushes, nail clippers, and scissors to cut hair. They are taught the proper use of these items. The BPHWT's school health education sessions provide students with information about malaria prevention, diarrhea prevention, hygiene, nutrition, influenza awareness, HIV/AIDS education, and drinking water systems. Filter systems linked to a large water dispenser are placed in the schools so that school children will have access to clean drinking water.

In this survey, the households reported the residents consumed unpurified water in the last 24 hours, 41.1 %, and gravity flow is the main source of drinking water. 29.7 % of households reported that there are no latrines in their household because of lack of equipment (41%) and lack of money (31%). Among households having latrines, 5.2% reported that the latrines in their houses are dirty and don't have enough water. 98% of total households in Pa Oh area drank unpurified water.

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Table 5 : Drinking water

Drinking Water	**Number**	**Percent (95% CI)**
Households reporting on their residents who consumed unpurified water in last 24 hours	658	41.1 % (38.7% - 43.4%)
Walking Distance to get drinking water within 15 Mins	1410	88.1% (86.4% - 89.6%)

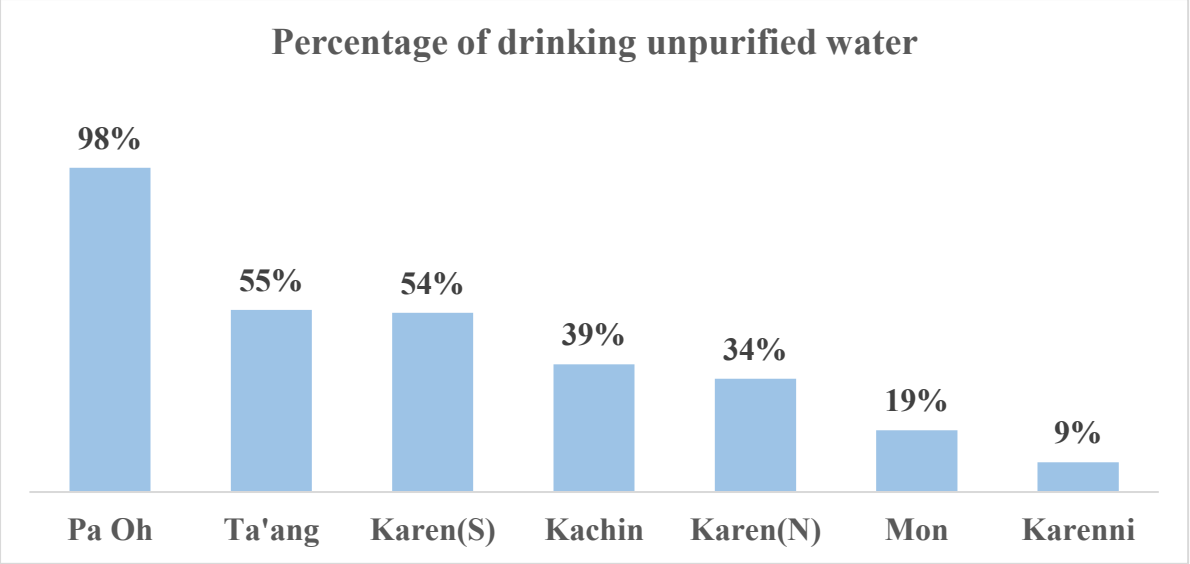


Figure 3: Percentage of drinking unpurified water

Table 6 : Comparison of drinking unpurified water data in 2013, 2016 and 2023

Indicators	2013	2016	2023 (95%CI)
Percentage of households reporting on their residents who consumed unpurified water (neither boiled nor filtered) in the last 24 hours	41.9%	44%	41.1% (38.7% - 43.4%)

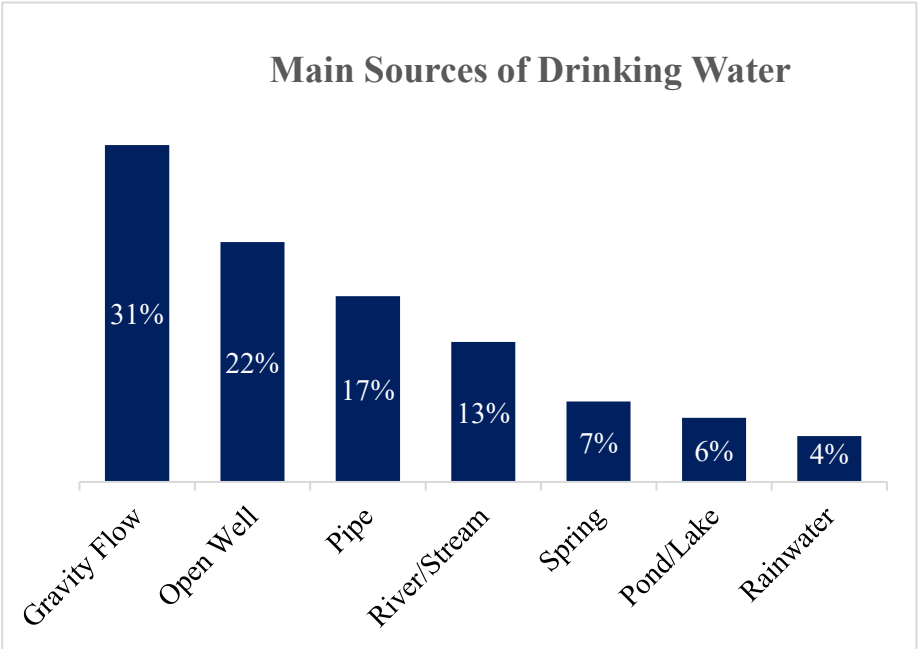


Figure 4 : : Main sources of drinking water

Table 7 : Community Latrines

Latrines	Number	Percent (95%CI)
Number of households having latrines	**1126**	**70.3 % (68.0% - 72.6 %)**
Number of households not having latrines	**475**	**29.7 % (27.4 - 32.0%)**
Latrines having roofs, walls, bowl, door and enough water	**923**	**57.7 % (55.2% - 60.1%)**

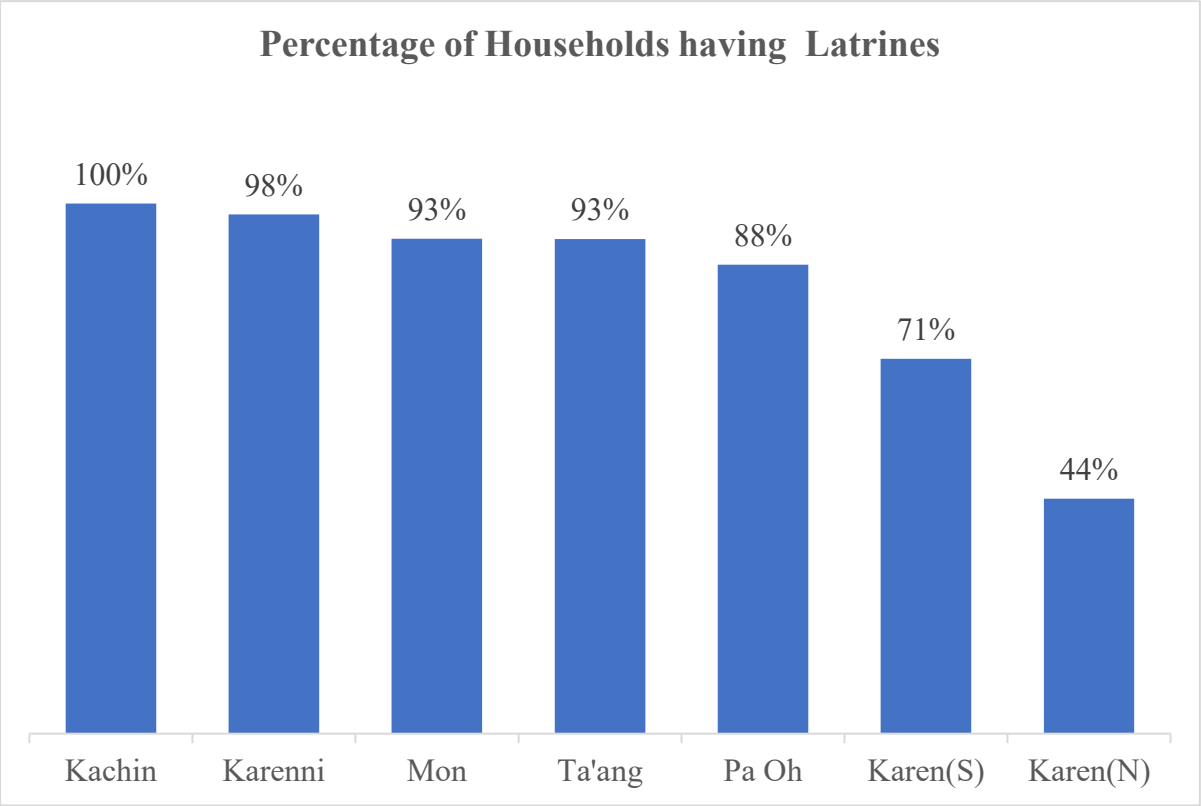


Figure 5 : Percentage of households having latrines

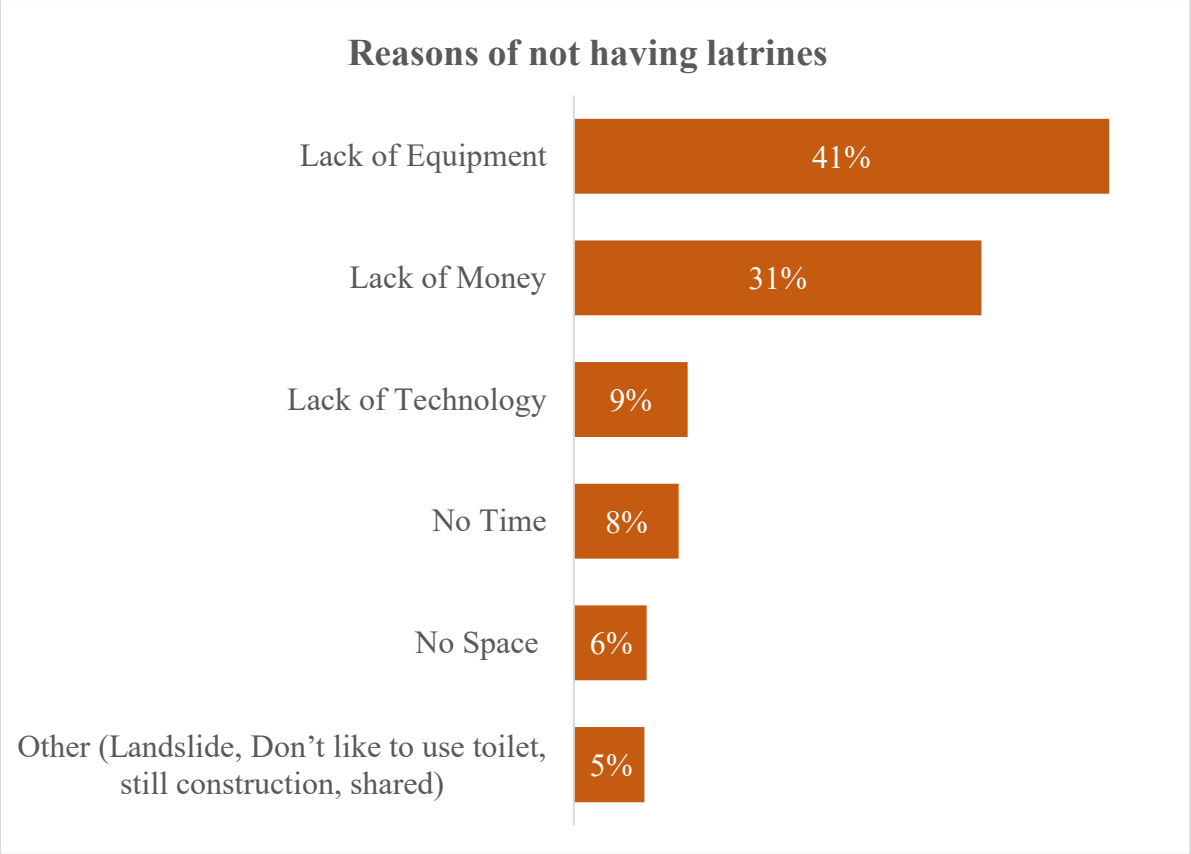


Figure 6 : Reasons of not having latrines

4.4 MALARIA

KEY INDICATORS

- 83.1% of households reported sleeping under a mosquito bed net.
- 54.9 % of people who receiving treatment got supervision of medical workers for drug taking.

4.6.1 MALARIA: HEALTH SEEKING BEHAVIOR

The emergence of resistance to Artemisinin in certain strains of P. falciparum malaria has elevated the importance of effectively controlling and eventually eradicating malaria in eastern Burma to a top priority in global health (9). In remote rural communities, the prevalence of counterfeit antimalarial drugs and limited access to government and international non-governmental organization (INGO) malaria control services has historically contributed to high rates of transmission, fostering conditions conducive to the spread of resistance (10, 11). To address these challenges, BPHWT has expanded its initiatives aimed at diagnosing, treating, preventing, and ultimately eliminating malaria transmission. Insights from the current survey indicate a decrease in both morbidity and mortality associated with P. falciparum malaria in regions served by ethnic and community-based organizations. However, continued efforts and additional resources are necessary to address persistent gaps in ensuring timely access to healthcare services.

Distribution long-lasting insecticidal nets (LLINs) in Mergue/Tavoy area

In this study, 83.1% of households reported using bed nets for sleeping, demonstrating a widespread adoption of malaria prevention measures. Although treatment guidelines do not require direct observation of adherence to treatment, directly observed therapy (DOT) reduces the risk for resistance by ensuring blood levels of medications are adequate to clear the infection (4). Among those received malaria treatment, with slightly over half of them receiving supervision from medical personnel to ensure proper drug administration. These findings underscore the importance of not only bed net usage but also enhancing access to

malaria testing and treatment services, as well as ensuring adequate medical supervision during treatment administration to effectively combat malaria transmission and improve health outcomes.

Table 8 : Malaria health seeking behavior

Malaria Health Seeking Behavior	Number	Percent (95% CI)
Household reported sleeping under a mosquito bed net	**1331**	**83.1% (81.2% - 84.9 %)**
Number of people receiving Malaria Treatment	**370**	
Number of people receiving supervision of medical workers for drug taking	**203**	**54.9 % (49.6 % - 60.0%)**

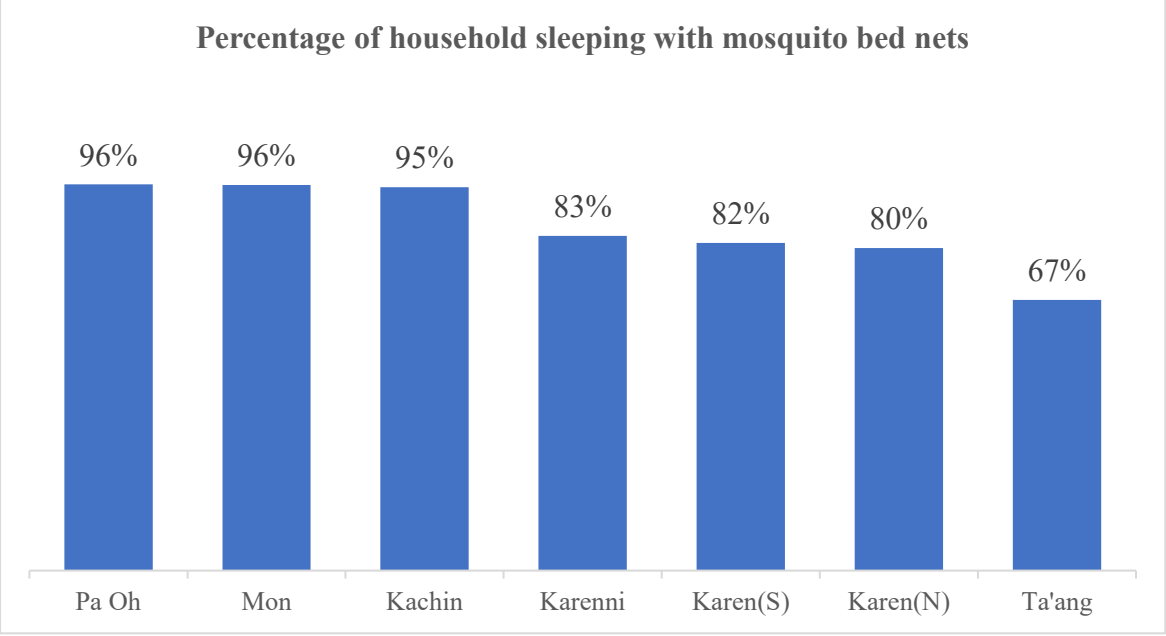


Figure 7 : Percentage of household sleeping with mosquito nets

4.5 REPRODUCTIVE HEALTH

KEY INDICATORS

- 32.8 % of pregnant women received four or more antenatal care visits as recommended by the World Health Organization.
- 35% of pregnant women did not receive antenatal care.
- 61.5% of women reported that a Trained Traditional Birth Attendant helped to deliver their last child.
- 82.9% of pregnant women delivered babies at home.
- Only 29 % of reproductive women who do not have desire to have more children used family planning methods.

Maternal health is one of the key indicators of health system effectiveness. It encompasses crucial services like timely access to appropriate antenatal and postnatal care, the presence of skilled health personnel during childbirth, and availability of family planning resources. Ethnic and community-oriented health entities operate maternal and child health initiatives with professional personnel. These professionals undergo rigorous training to deliver comprehensive pre and postnatal care, ensure safe deliveries, and provide education and contraception for family planning. Indicators such as unmet contraception demand and inadequate antenatal care visits highlight the persistent necessity for bolstering and enhancing maternal and child health services (4).

4.4.1 SKILLED BIRTH ATTENDANTS

The presence of a skilled birth attendant during childbirth emerges as a pivotal intervention aimed at preventing maternal mortality and safeguarding the well-being of the infant. This is especially critical considering the necessity for prompt and proficient care delivery during instances of emergency obstetric or neonatal conditions. In eastern Burma, ethnic women of reproductive age and pregnant women have relied on traditional birth attendants for assistance during childbirth. However, in numerous remote regions, access to secondary or tertiary healthcare professionals is limited, a challenge exacerbated by conflict, militarization, displacement, and movement restrictions. Recognizing this critical gap, BPHWT has taken proactive steps to address the issue by leveraging the existing network of traditional birth attendants. Through this initiative, BPHWT is empowering MCH, EmOC, Medic and TBAs

by providing them with the necessary knowledge, skills, and infrastructure to establish a robust foundation for ensuring safe deliveries and promoting maternal health.

Our research revealed a significant reliance on traditional birth attendants (TBAs), with over 60% of women reporting TTBA assistance during their last childbirth. Initiatives focused on training and deploying skilled birth attendants, alongside community education efforts, are essential for improving maternal and child health outcomes and reducing reliance on traditional birth practices. 82.9% of pregnant women delivered their last baby at home.

Table 9 : Presence of skilled birth attendant (Multiple responses)

Presence of Skilled Birth Attendant	Number	Percent (95% CI)
Trained Traditional Birth Attendant	863	61.5% (58.9% - 64.0%)
Doctor/ Medic/Nurse/Health Worker	453	32.2% (29.8% - 34.8%)
Other*	88	6.3% (51.0% - 77.0%)

*Village leader, relatives, friends, community

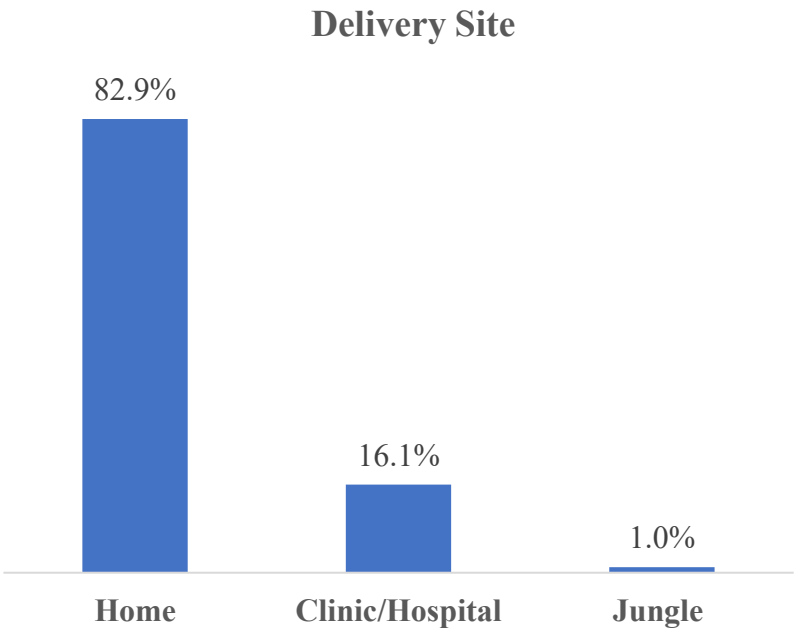


Figure 8 : Delivery site

4.4.2 ANTENATAL CARE

Antenatal and postnatal care visits conducted by skilled healthcare providers are considered an essential component of reproductive health care. These visits can help prevent, detect, and treat conditions that pose a potential risk to the life of a pregnant woman and her baby. To ensure comprehensive care, the World Health Organization recommends at least four antenatal visits for procedures such as blood pressure screening, vaccination with tetanus toxoid, screening and treatment of infections, and tests for anemia.

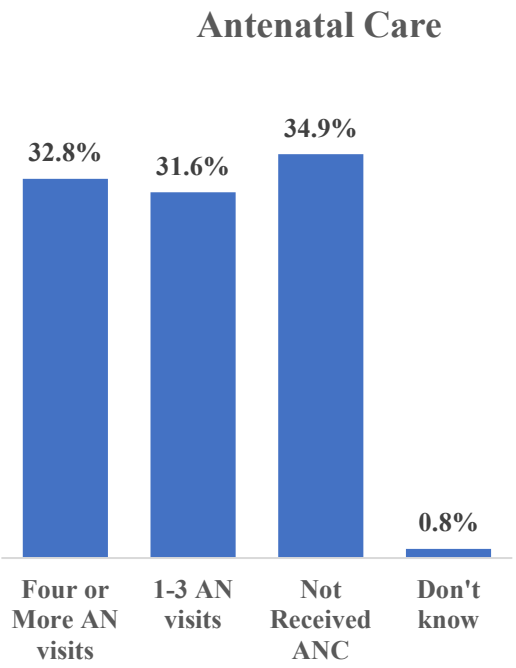
Among the participants surveyed, more than a third did not receive antenatal care (ANC), highlighting gaps in reproductive healthcare access. 32.8 % of women who did receive ANC during their last pregnancies adhered to the World Health Organization's recommended standard of four or more visits. Furthermore, among those who accessed antenatal care services, over 70% sought assistance from skilled healthcare providers, including doctors, nurses, medic and health worker. However, 35% of pregnant did not receive any antenatal care during their pregnancies.

Table 10 : Presence of antenatal caregivers (Multiple responses)

Presence of Antenatal Caregivers	Number	Percent (95% CI)
Trained Traditional Birth Attendant	273	28.8% (25.9% - 31.8%)
Doctor/ Medic/ Nurse/ Health Worker	669	70.6 % (67.6% - 73.5%)
Other*	6	0.6 % (2.0% - 14.0%)

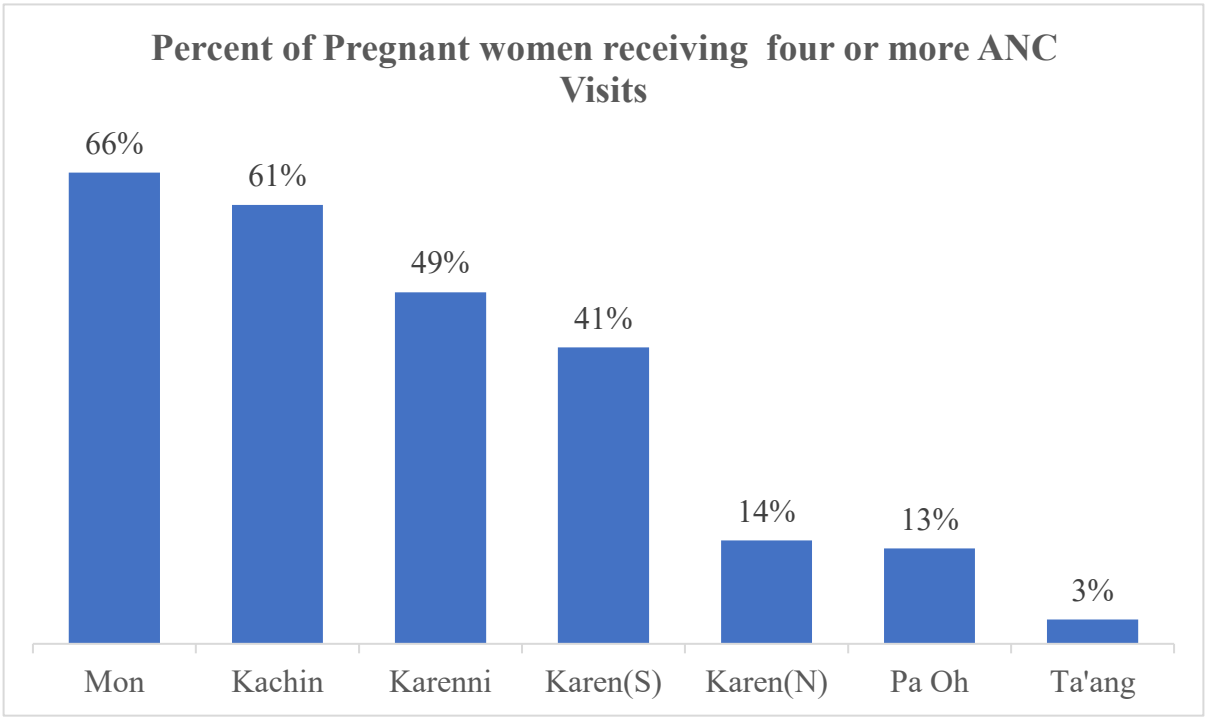
*Village leader, relatives, friends, community

Figure 9 : Percentage of antenatal care



In figure 10, it can be seen that 66% of pregnant women in Mon received four or more AN visits, whereas only 3% of pregnant women in Ta'ang got four or more AN visits. This underscores the necessity of strengthening healthcare infrastructure and workforce capacity to ensure equitable access to quality reproductive and maternal and child health services. Moving forward, it is imperative to prioritize interventions aimed at increasing ANC coverage, promoting timely and comprehensive care, and expanding the reach of skilled healthcare providers, particularly in underserved communities.

Figure 10: Percentage of pregnant women receiving four or more ANC visits



4.4.3 FAMILY PLANNING AND CONTRACEPTIVE USE

Family planning plays an essential role in enabling individuals to manage their fertility and decide on the desired number of children and the timing between births. In this study, reproductive age women refer to women aged 15 to 49, the period during which they are biologically capable of conceiving and bearing children. This empowerment is crucial for reducing maternal mortality rates and enhancing the overall health outcomes for both mothers and infants. Additionally, the provision of easily accessible family planning services, including counseling, referral options, and a variety of contraceptive methods, can contribute significantly to lowering the incidence of unsafe abortions and unintended pregnancy (6).

Among survey respondents, only 29 % of women who are not pregnant and do not desire any more children are using a modern form of contraception. However, the unmet need for contraception the proportion of women who are fecund, sexually active, and do not desire any children but are not using any contraception) remains high. In total, the survey found that 83.8% of women had an unmet need for contraception. Of the women surveyed who use modern methods of contraception, the vast majority (52%) used depot medroxyprogesterone acetate (DMPA) injections, followed by oral contraceptive pills (21%) and implant (20%).

Table 11 : Contraceptive use

Number of Female (Reproductive age) in households	2012/4332 (46%)
Number of Reproductive-age women respondents	1312
% of women using contraceptive methods	381/1312 (29%)

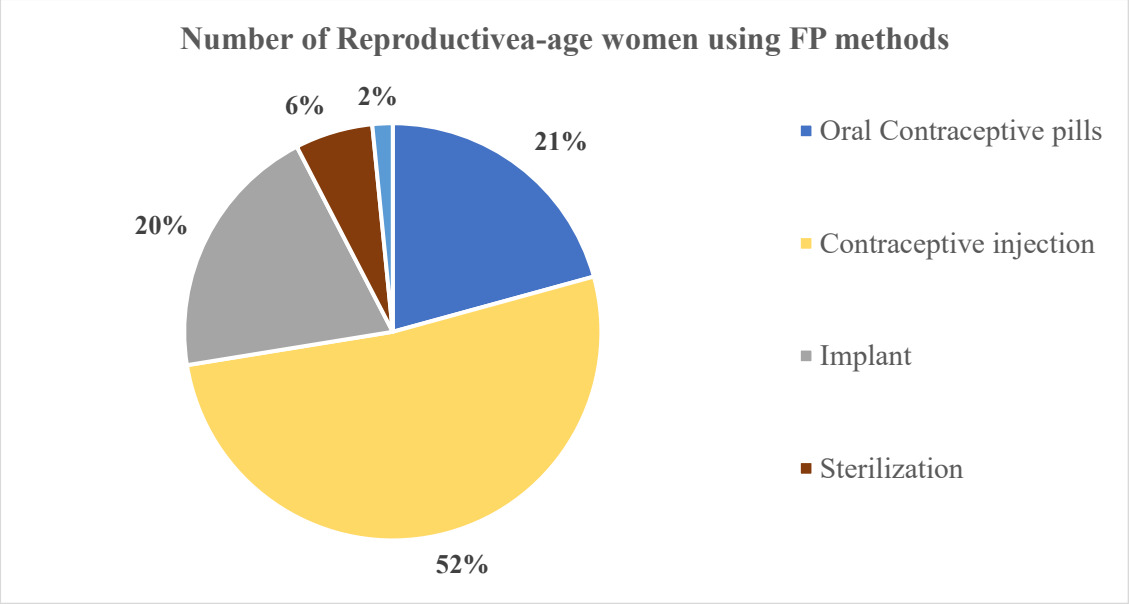


Figure 11 : Family planning methods among all women using contraception (n = 381)

When comparing reproductive health data from 2013 and 2016, the percentage of pregnant women who received at least four ANC visits in 2023 is significantly higher, almost double that of 2013. The use of family planning methods has also increased compared to both 2013 and 2016. However, the percentage of births attended by skilled birth attendants is relatively lower than it was in 2016.

Table 12: Comparison of reproductive health data in 2013, 2016 and 2023

Indicators	2013	2016	2023 (95%CI)
Percentage of pregnant women who received four or more ANC visits	17	21.8	32.8 (30.3% - 35.3%)
Percentage of births attended by skilled health personnel	15.7	34.6	32.2 (29.8% - 34.8%)
Percentage of women using modern family planning methods	24.3	25.2	29 (26.6% - 31.6%)

4.6 CHILD NUTRITION

KEY INDICATORS

- 4.6% of children between the ages of 6 - 59 months have moderate or severe malnutrition using MUAC-for-age z-scores.
- In total, 33.6 % of children between the ages of 6 - 59 months received Vitamin A supplements and 50.2 % received deworming medicine.

Using a MUAC-for-age approach as suggested by the World Health Organization, this study revealed that 4.6% of children between the ages of six months and 59 months have malnutrition. According to the World Health Organization, GAM values above 10% are considered "serious" while values over 15% are considered "critical" and should prompt initiation of supplementary feeding and therapeutic programs. Improved access to basic interventions addressing malnutrition should be considered in these communities.

A health worker measuring U5 nutrition status by MUAC

A health worker distributing Vit A and deworming medicine to students at school

The World Health Organization recommends periodic de-worming of all school age children living in endemic areas, along with proper hygiene and sanitation practices to address soil-transmitted helminth infections, which can result in impaired nutritional status. Helminth infections are transmitted by eggs present in human faeces, which contaminate the soil in areas where sanitation is poor (7). It can cause night blindness and increase the risk of disease and death from severe infections. Supplementation in all children aged 6-59 months is recommended by the WHO as a cost-effective intervention to reduce childhood morbidity and mortality, particularly from infectious diseases such as measles and diarrhea (8). Among surveyed children between 6 months and 59 months of age, 50.2 % received de-worming treatment, and 33.6 % received vitamin A supplementation.

Table 13 : Nutrition status between the ages 6 months and 59 months

Nutrition Status	Number	Percent (95% CI)
Normal / Green (≥12.5 cm / ≥125 mm))	973	95.4 % (93.9% - 96.6%)
Moderately malnourished/ Yellow (11.5 - 12.4 cm / 115 - 124 mm)	34	3.3 % (2.2% - 4.4%)
Severely malnourished / Red (< 11.5 cm / < 115 mm)	13	1.3 (0.7% - 2.2%)
Children between 6 to 59 months with malnutrition	47	4.6 % (3.4% - 6.1%)
Children between 6 to 59 months receiving deworming	512	50.2% (47.1% - 53.3%)
Children between 6 to 59 months receiving Vitamin A	343	33.6 % (30.7% - 36.6%)

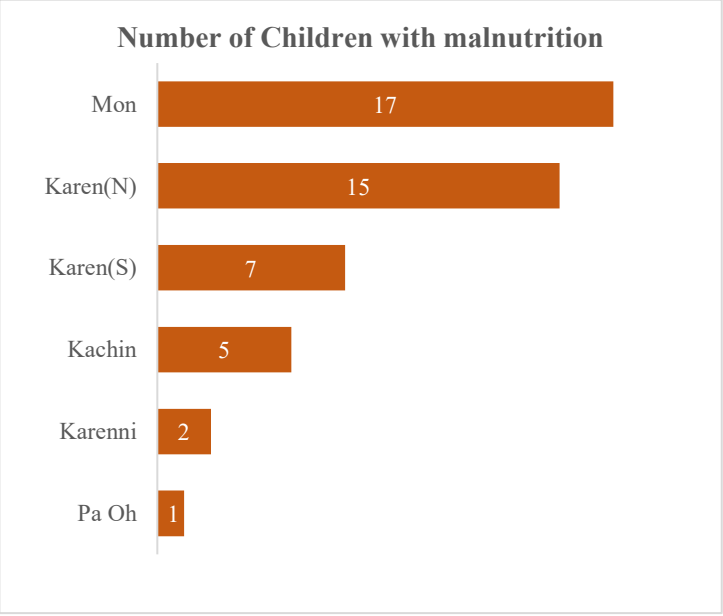


Figure 12:Number of children between 6 to 59 months with malnutrition

Mon area has the highest incidence of malnutrition, accounting for 36.2% of all malnourished children, followed by Karen (N) with 31.9%. It is essential to implement targeted nutritional programs in both Mon and Karen(N) as a priority to significantly reduce malnutrition rates and enhance the health and well-being of children in these areas.

Table 14: Comparison of malnutrition data in 2004, 2013, 2016 and 2023

Indicators	2004	2013	2016	2023 (95%CI)
Percentage of children under 5 years with malnutrition (according to accepted guidelines for MUAC cut-off)	15	10.5	6.4	4.6 % (3.4% - 6.1%)

4.7 BIRTH REGISTRATION

KEY INDICATORS

- 73.5% of children have birth registration records.
- 60.2% of households knew the process of birth registration.

Another indication of the marginalized status of the households surveyed is the significantly low rate of official birth registration. While the reported national birth registration rate in Burma stands at 79% (12), only 26.1% of the children included in this survey possess an official birth certificate .

The Backpack Health Worker Team provides a vital service to the communities they serve by issuing their own birth certificates. According to the survey findings, 73.5% of children have a birth record. Furthermore, over half of households (60.2%) are aware of the process to register birth records for their children.

A health worker recording a birth registration

Table 15 : Birth registration status

Birth Registration Status	Number	Percent (95% CI)
Not Having Birth Registration Record	357	26.9% (24.5% - 29.4%)
Having Birth Registration Record	976	73.5% (71.0% - 75.9%)
Knowing about Birth Registration	799	60.2% (57.5% - 62.8%)
Don’t know about Birth Registration	521	39.2%

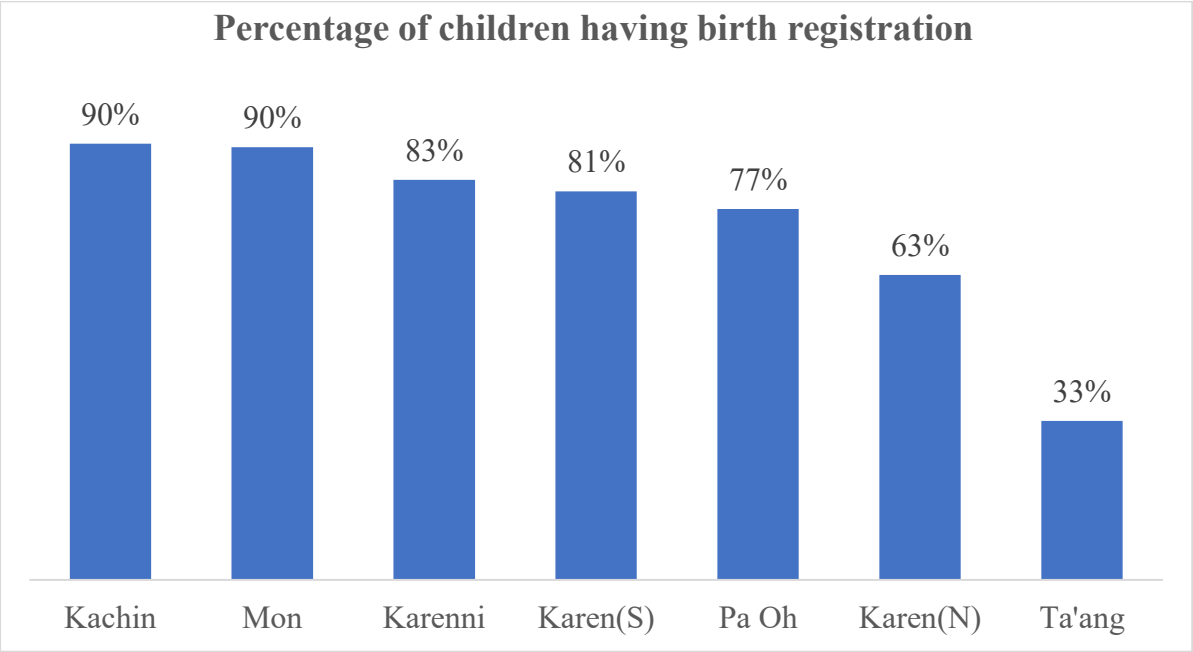


Figure 13 : Percentage of children having birth registration

4.8 IMMUNIZATION

KEY INDICATORS

- 30.0% of children under 2 years received immunization.
- 50.9% of children under 5 years received immunization.

Immunization plays a vital role in safeguarding children under 18 months, especially in remote and ethnic areas in Burma, for several reasons. Vaccines are the world's safest method to protect children from life-threatening diseases and the greatest advances in global health and development. It prevents potentially life-threatening diseases such as measles, polio, and tetanus, which can have severe consequences in areas with limited healthcare access(13).

A health worker administering oral polio vaccine (OPV) to a child in Mutraw area

In addition, immunization contributes to community immunity by KDHW leads and BPHWT participation, protecting vulnerable individuals who cannot receive vaccines themselves. It also helps prevent outbreaks in regions facing challenges like inadequate sanitation and overcrowding. Ensuring access to immunization services in these areas promotes equity in healthcare access, providing children with the same level of protection as their urban counterparts and ultimately contributing to better public health outcomes.

Table 16 : Immunization status

Immunization Status	Number	Percent (95% CI)
Children under 2 years receiving immunization	209	30.0% (26.6% - 33.6%)
Children under 5 years receiving immunization	622	50.9% (48.0% - 53.7%)

4.9 MIGRATION OUT

KEY INDICATORS

- 14.2% of total population in surveyed households' migrant out.
- Over half of migrant people (52.9%) left their homes for job opportunities.

Myanmar has experienced significant internal and external migration for various reasons, including economic, social, and political factors. Economic opportunities often drive internal migration within the country, as people move from rural areas to urban centers in search of employment and better living conditions. However, internal displacement due to conflict and persecution is also prevalent, particularly among ethnic minority groups in regions affected by long-standing armed conflicts (3, 4). External migration, including both legal and irregular migration, occurs for similar reasons, with many Myanmar nationals seeking better economic prospects and living conditions abroad. Factors such as poverty, limited access to education and healthcare, as well as political instability and human rights abuses, contribute to the decision to migrate. The post-February 2021 influx brings heightened risks for migrants, including the erratic introduction of laws in Myanmar affecting passports and overseas work, as well as potential security threats (1).

Villagers evacuating their homes to escape from fighting in their area

Table 17 : Migration out

Migrants	Number	Percent (95% CI)
Number of migrant people	1181	14.2% (13.4% - 14.9%)
Number of Male migrants	688	8.3% (77.0% - 89.0%)
Number of Female migrants	493	5.9% (54.0% - 64%)

The survey findings indicate that 14.2% of the total population in surveyed households have migrated out, with 8.3% being male and 5.9% female. The primary reason cited for migration, 52.9% is job opportunities, followed by education at 19.6%. Among migrants, nearly half of the migrants were from Karen(S).

Age Group among migrants	Number	Percent
Under 5 years	27	2.3 %
5-14 years	158	13.4 %
15-24 years	411	34.8 %
25-34 years	343	29.0 %
35-44 years	137	11.6 %
45-54 years	57	4.8 %
>55 years	48	4.1 %
Total Migrants	**1181**	

Table 18 : Reasons for migration out

Reasons of Migration Out	Number	Percent
Job	625	52.9 %
Education	232	19.6 %
Family	42	3.6 %
Marriage	167	14.1%
Insecurity	41	3.5 %
More Safety	14	1.2 %
Other	38	3.2 %
No reason/Refuse/ Don’t know	22	1.9 %

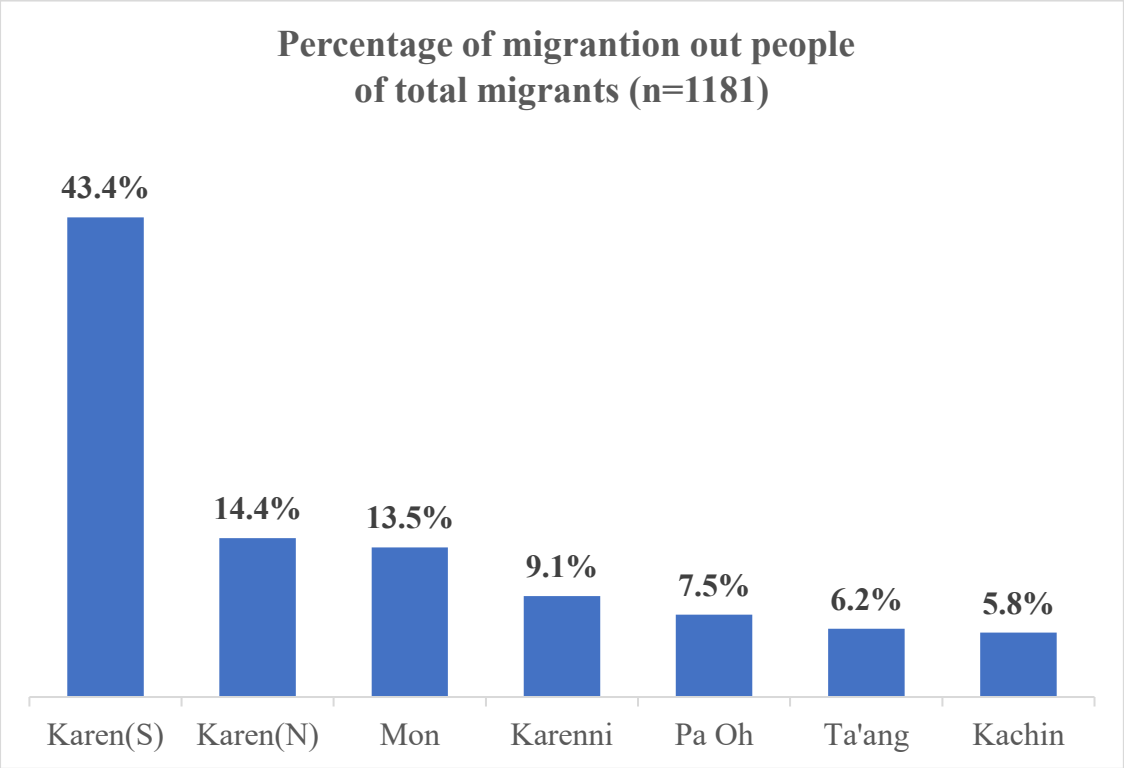


Figure 14 : Percentage of migration out people of total migrants

4.10 MORTALITY

KEY INDICATORS

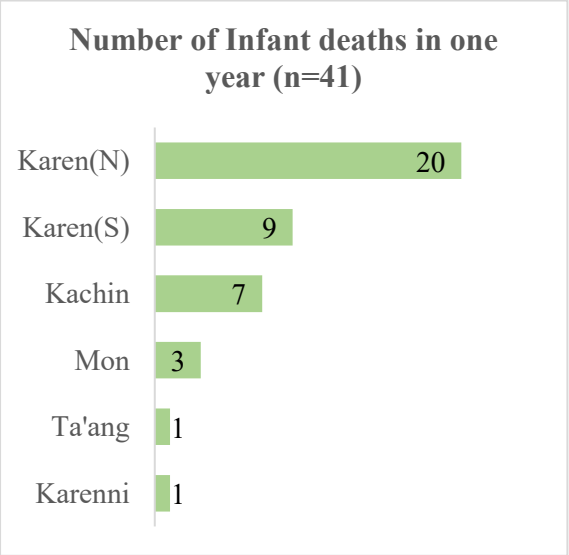
- Diarrhea and fever related cases are the main reported causes of death for children under 5 years.
- IMR and U5MR remain high.
- IMR is 172 per 1,000 population, and U5MR is 188 per 1,000 population.

Neonatal mortality rate (NMR) is the number of deaths in children within the first 28 days of life, per 1,000 live births. The infant mortality rate (IMR) is the number of deaths in children less than one year of age, per 1,000 live births. The under-5 mortality rate) is the number of infants and children who die by the age of five, also per 1,000 live births per year. IMR and U5MR are sensitive indicators of the performance of the health system of a region. The majority of these deaths occur as a result of preventable conditions, including infections, malnutrition and complications during pregnancy or delivery, and can often be reduced with simple public health interventions.

Table 19 : Mortality Rate within one year

Mortality Rate	Number	Per 1,000 population	Percent (95% CI)
Crude Mortality Rate (CMR) 0.29 deaths per 10,000 population per day	87	10	1% (0.8% - 1.3%)
Number of Infant Deaths in one year	41	172	17.2% (12.6% - 22.5%)
Number of Under 5 years Deaths in one year	45	188	18.8% (14.1% - 24.4%)
Number of Live Births in one year	239		

The key mortality indicators for children under 5 years show that mortality rate, remain high compared to baseline data in 2016 IAS survey and national data in Myanmar, 40.1 U5MR per 1,000 live births per year (2, 5). Diarrhoea and cases related with fever were the main causes of death for U5 population. The standard emergency mortality threshold, defined as a Crude Mortality Rate (CMR) of 1 per 10,000 people per day, was used for mortality surveillance (15). In our study, the observed CMR is 0.29 per 10,000 people per day.



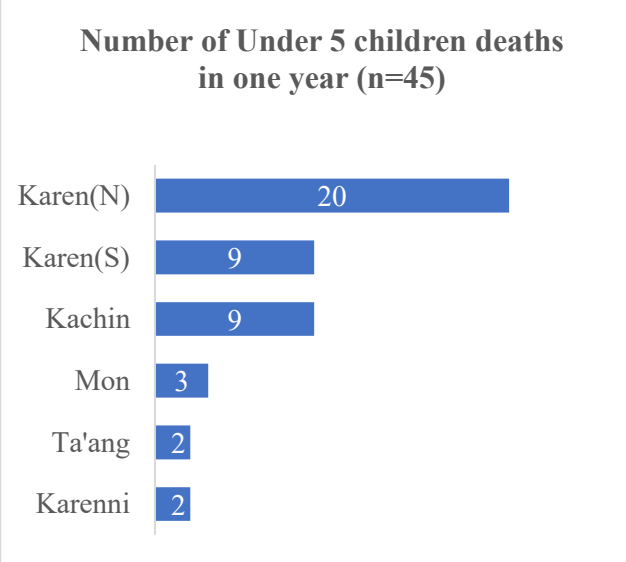


Figure 15 : Number of infant deaths in one year Figure 16 : Number of under five deaths in one year

During the survey period, it was observed that Karen (N) area recorded the highest number of infant mortality and under 5 mortalities, accounting for approximately half of the total deaths within a year. This highlights an urgent need for targeted interventions aimed at improving maternal and child healthcare services, enhancing access to skilled birth attendants, and strengthening healthcare infrastructure in these regions.

Table 20: Comparison of mortality data in 2003, 2013 and 2023

Indicators	2003	2013	2023 (95% CI)
Infant mortality rate (per 1,000 births)	129	118	172(126 – 225)
Under 5 Mortality Rate (per,1000 births)	266	195	188 (141 – 244)

5. CONCLUSION

While some health outcomes in surveyed region exhibit signs of improvement, ongoing challenges remain. Notably, mortality rates among neonates, infants, and children under five in eastern Burma starkly surpass Myanmar national data (2). Preventable diseases such as diarrhea and fever related cases emerge as the primary causes of death across all age groups.

Reliance on TTBAs for deliveries persists, more than half of pregnant women opting for their assistance during childbirth. Antenatal care attendance meets global recommendations in only 32.8% of cases, highlighting gaps in maternal health services. Similarly, family planning uptake remains low compared to national coverage rate (71.1%) in Myanmar (16), with only 29 % of reproductive-aged women utilizing contraceptive methods. WASH concerns persist, with nearly half of households consuming unpurified water. Access to safe drinking water primarily relies on gravity flow and open wells, emphasizing the need for improved sanitation infrastructure.

The region's health landscape has been further complicated by the Burma military coup, leading to heightened conflict in ethnic areas. Station clinics have transitioned to mobile healthcare services due to ongoing military operations, hindering access to essential medical supplies and communication infrastructure.

Recognizing the pivotal role of ethnic and community-based health organizations, increased international support is imperative to address the entrenched health crisis and ensure the well-being of marginalized communities. Their unique ability to understand and meet the diverse needs of vulnerable populations underscores the urgency of formal recognition and bolstered support during this tumultuous period.

6. RECOMMNDATIONS

It is essential to strengthen community-based health interventions focused on maternal and child health as under 5 mortality rate is still high. Enhancing access to essential healthcare services such as antenatal and postnatal care, ensuring timely detection and treatment of childhood illnesses. Educational programs targeting caregivers should also be enhanced to raise awareness about proper nutrition, hygiene, and childcare practices, thereby contributing to improved child health outcomes.

Efforts should be made to improve access to prompt diagnosis and treatment of malaria cases through community-based testing and treatment centers. Regular surveillance and monitoring of malaria prevalence are also crucial to inform targeted intervention strategies and prevent outbreaks.

Diarrhea prevention and management require a focus on promoting improved water, WASH practices. Training such as community education programs that emphasize safe water storage, handwashing, and proper sanitation facilities, and trainings on the management of diarrheal illnesses, including oral rehydration therapy and appropriate antibiotic use should deliver to ensure effective treatment and reduce mortality rates associated with diarrheal diseases.

It is imperative to strengthen immunization infrastructure and service delivery systems. This includes ensuring the availability of vaccines in all communities through robust cold chain management and vaccine supply chains. Targeted outreach and awareness campaigns should also be conducted to address misconceptions and concerns about vaccination among caregivers, while integrating immunization services with other primary healthcare initiatives can increase access and uptake.

To tackle the issue of low contraceptive use, efforts should focus on expanding access to a range of contraceptive methods and family planning counseling services. Ensuring the availability of contraceptive commodities and trained providers at all levels of the healthcare system is essential to meet the diverse needs of women and couples.

Addressing the high number of pregnant women with inadequate antenatal care (ANC) visits requires strengthening ANC services and enhancing community-based outreach programs, focusing in low AN visits rate (Ta'ang, Pa Oh and Karen (N). Comprehensive care packages

should include regular health check-ups, screening for high-risk conditions, and health education, particularly in remote or underserved areas.

Lastly, in the situation where a continuation of emergency and humanitarian assistance is needed, humanitarian and other aid organizations must ensure that emergency and humanitarian assistance reach those targeted populations most requiring such assistance. These emergency and humanitarian assistance must be delivered through cross-border operations and in direct cooperation with local implementing organizations. In the establishment of a federal health system, international and regional organizations are urged to cooperate with the EHOs/ECBHOs, and local CSOs.

7. REFERENCES

1. BPHWT. Annual Report. 2023.
2. UNICEF. Monitoring the situation of children and women. 2024 [Available from: https://data.unicef.org/country/mmr/.
3. BPHWT. Life, Liberty and The Pursuit of Health, Ten Years Report. 2009.
4. HISWG. The Long Road to Recovery. February 2015
5. BPHWT. Impact Assessment Survey. 2017.
6. WHO. WHO updates recommendations to guide family planning decisions 2024 [Available from: https://www.who.int/news/item/15-11-2022-who-updates-recommendations-to-guide-family-planning-decisions.
7. WHO. Helminth control in school-age children: a guide for managers of control programmes: World Health Organization; 2011.
8. Imdad A, Mayo-Wilson E, Haykal MR, Regan A, Sidhu J, Smith A, et al. Vitamin A supplementation for preventing morbidity and mortality in children from six months to five years of age. Cochrane database of systematic reviews. 2022(3).
9. Binet L. MSF and the Rohingya 1992-2014: Medecins Sans Frontieres; 2020.
10. Richards AK, Smith L, Mullany LC, Lee CI, Whichard E, Banek K, et al. Prevalence of Plasmodium falciparum in active conflict areas of eastern Burma: a summary of cross-sectional data. Conflict and Health. 2007;1:1-10.
11. Richards AK, Banek K, Mullany LC, Lee CI, Smith L, Oo EKS, et al. Cross-border malaria control for internally displaced persons: Observational results from a pilot programme in eastern Burma/Myanmar. Tropical Medicine & International Health. 2009;14(5):512-21.
12. UNICEF. Vital Statistics. World Statistics Day.Better data, better live.2015.
13. UNICEF. Immunization 2024 [Available from: https://www.unicef.org/immunization.
14. WHO. Water, sanitation and hygiene (WASH) 2024 [Available from: https://www.who.int/health-topics/water-sanitation-and-hygiene-wash#tab=tab_1.
15. UNHCR. Mortality surveliance threshold.2024.
16. MOHS. Public Health Statistics (2017-2019). Health Information Division, Department of Public Health.2021.

8. APPENDIX: SURVEY QUESTIONNAIRE

Date: ☐☐ ☐☐ ☐☐ Surveyor ID: ☐☐ Village name: _____

BP ID: ☐☐☐☐☐ Cluster ID: ☐☐ Household : ☐☐

Start time (use 24 hour time): ☐☐ ☐☐

READ THE FOLLOWING CONSENT TO THE RESPONDENT BEFORE STARTING THE SURVEY: *We will ask questions about your family's health situation and knowledge. This information will be used by the Back Pack Health Worker Team so that they can improve health programs in your area. Some questions might be sensitive and personal. All responses will be kept confidential. Please stop me if you have any questions. Please tell me if you prefer not to answer a particular question or continue with the survey.*

Do you want to complete the survey?..... ☐

Yes = Agree to participate in the survey

No = Disagree – Do not continue the interview

SECTION (1) HOUSEHOLD MEMBER LIST

List the age & sex of all people living in this household **(*everyone who lives in your house, shares meals, and sleeps under the same roof for at least two months*)** Don't forget to include yourself, children & infants.

1A. MARK "X" FOR PERSON ANSWERING QUESTIONS		HH.1 AGE For both YEARS and MONTHS 88=Refused 99=Don't Know Put "00" for children under 1 month						HH.2 SEX 0=Male 1=Female 8=Refused 9=Don't Know	HH.3 How is this person related to you? 00 = self 01 = Parent 02 = Husband/Wife 03 = Child 04 = Uncle/Aunt 05 = Bro/Sis 06 = Nephew/Niece 07 = Friend 08 = Cousin 99 = Don't know 88 = Refused
	1.			Yr.			Mo.		
	2.			Yr.			Mo.		
	3.			Yr.			Mo.		
	4.			Yr.			Mo.		
	5.			Yr.			Mo.		
	6.			Yr.			Mo.		
	7.			Yr.			Mo.		
	8.			Yr.			Mo.		
	9.			Yr.			Mo.		
	10.			Yr.			Mo.		

HH4. Total Number of people in the household _____

SECTION (2) WATER AND SANITATION

WA.1	Where do you usually get water for drinking**?** **(Choose all that apply)** **SURVEYOR: DO NOT READ ANSWER CHOICES**	☐ Pipe (plastic or bamboo) ☐ Pump ☐ Gravity flow ☐ River/Stream ☐ Pond/Lake ☐ Spring ☐ Open Well ☐ Rain Water (basin, pot or bamboo) ☐ Other (_____) ☐ Refused ☐ Don't know	
WA.2	How long does it take you to get to your main source of water for drinking by walking?	0 = 0 – 5 minutes 1 = 6 – 15 minutes 2 = More than15 minutes 8 = Refused 9 = Don’t know	
WA.3	In the last day (the last 24 hours), did you drink any water that was not boiled or filtered?	0 = No 1 = Yes 8 = Refused 9 = Don't know	
WA.4	Does your household have its own latrine?	0 = No 1 = Yes 8 = Refused 9 = Don't know	If "0" skip to WA.8
WA.5	Show me your own latrine. **SURVEYOR: OBSERVE THE LATRINE**	☐ Has a roof ☐ Has walls ☐ Has a door ☐ Has a plastic bowl ☐ Has a ceramic bowl ☐ Has an air flow pipe ☐ Has a deep hole ☐ It is dirty/has a bad smell ☐ It doesn’t have enough water ☐ Other (_____) ☐ Refused ☐ Don't know	

WA.6	Do you use the latrine that you have?	1=Always 2=Sometimes 3= Never 8=Refused 9=Don't Know	☐ If "1" skip to ML.1
WA.7	Why don't you use the latrine that you have? (Choose all that apply) **SURVEYOR: DO NOT READ ANSWER CHOICES**	☐ Dirty ☐ Smells bad ☐ Not my custom ☐ Too far ☐ Erodes the earth ☐ Other _____ ☐ Refused ☐ Don't know	
WA.8	Why doesn't your household have a latrine? (Choose all that apply) **SURVEYOR: DO NOT READ ANSWER CHOICES**	☐ No money to build a latrine ☐ No materials to build a latrine ☐ No time to build a latrine ☐ Don't know how to build a latrine ☐ No land to build a latrine on ☐ Other (_____) ☐ Refused ☐ Don't know	

SECTION (3) MALARIA

ML.1	How many people in this household slept under a mosquito net last night?	Number of people who slept under a mosquito net 88=Refused 99=Don't know	☐☐
ML.2	Was there any person in your household who most recently had fever tested for malaria? (Within six month)	0=No one had fever 1=No, person did not get tested 2=Yes, person got tested 8=Refused 9=Don't know	☐ If "0" skip to # RH.1
ML.3	For the person who most recently had fever, was he/she treated for malaria?	0=No, person did not get treatment 1=Yes, person got treatment 8=Refused 9=Don't know	☐ If "0" skip to # RH.1
ML.4	When this person took the malaria medicine, did a health worker come to the house at least once to ensure that they took all of the medicine and took the medicine at the right time?	0=No 1=Yes 8=Refused 9=Don't know	☐

SECTION (4) REPRODUCTIVE HEALTH

(Skip these RH questions if the person who you will ask is a single woman or a single man). If you interview a married man, ask about his wife.

RH.1	Are you or your wife currently pregnant?	0=No 1=Yes 8= Refuse 9= Don't know	☐
RH.2	How many times have you or your wife been pregnant? (Include current pregnancy and all previous pregnancies, including spontaneous/induced abortions and miscarriages)	Number of pregnancies 88=Refused 99=Don't know	☐☐ *If "00" skip to # RH.9*
RH.3	Did you see anyone for antenatal care during last/current pregnancy?	0=No 1=Yes 8= Refused 9= Don't know	☐ *If "0" skip to # RH.7*
RH.4	Who provided antenatal care during last/current pregnancy? (Choose all that apply)	☐ Doctor/Medic/Nurse/HW ☐ Trained Traditional Birth Attendant ☐ Other (_____) ☐ Refused ☐ Don't know	
RH.5	Where did you receive antenatal care during last/current pregnancy? (Choose all that apply)	☐Home ☐Hospital/clinic ☐Jungle ☐Other (_____) ☐ Refused ☐ Don't know	
RH.6	How many antenatal care visits did you have during last/current pregnancy?	0=Three or fewer visits 1=Four or more visits 8=Refused 9=Don't know	☐
RH.7	Where did you deliver your last baby?	0=Current first pregnancy	

		1= Home 2= Hospital/clinic 3= Jungle 4=Other (_____) 8= Refused 9= Don't know	☐ If "0" Skip to # Section 5
RH.8	Who delivered your last baby? (Choose all that apply)	☐ Doctor/Medic/Nurse/HW ☐ Traditional birth attendant ☐ Other (_____) ☐ Refused ☐ Don't know	
RH.9	Do you want another child?	0=No 1=Yes 8=Refused 9=Don't know	☐ *If "1" skip to Section 5*
RH.10	Do you or your husband currently do anything to prevent or delay pregnancy?	0=No 1=Yes 8=Refused 9=Don't know	☐ *If "0" skip to Section 5*
RH.11	What are you doing (which method are you using) now to delay or prevent pregnancy?	0=None 1=Oral pills 2=Depo 3=Condom 4=Other (_____) 8=Refused 9=Don't know	☐

SECTION (5) NUTRITION

Surveyor: Measurement and Observation

Child ID	Sex (f/m)	Birthday* (DD/MM/YYYY)	Age (Months)	Bilateral Oedema (y/n)	MUAC (mm) (000) left arm	Vitamin A (y/n)	De-worming (y/n)
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		
		___/____/____	___ M		___.___ mm		

SECTION (6) BIRTH REGISTRATION

BR.1 DOES (*name*) HAVE A BIRTH CERTIFICATE? *If yes, ask:* MAY I SEE IT?	Yes, seen .....1 Yes, not seen .....2 No.....3 Refused…… 8 DK.....9
BR.2 DO YOU KNOW HOW TO REGISTER YOUR CHILD'S BIRTH?	Yes ..... 1 No..... 2 Refused…… 8

SECTION (7) IMMUNIZATION

IM1. DOES YOUR CHILD HAVE AN IMMUNIZATION SCHEDULE?		0=No 1=Yes 8=Refused 9=Don't know			☐ *If "0" Skip to # Section 8*
IM2. DO YOU HAVE A CARD WHERE (*name*)'S VACCINATIONS ARE WRITTEN DOWN? (*If yes*) MAY I SEE IT PLEASE?		Yes, seen..... 1 Yes, not seen..... 2 No card 3			☐ *If "0" Skip to # Section 8*
IM3. (A) IMMUNIZATION FROM WHICH ORGANIZATION **(OBSERVE THE IMMUNIZATION CARD)**		1 = MOHS 2 = EHOs 3 = Private hospitals/clinics			☐ *If "0" Skip to # Section 8*
IM4. *Type of IMMUNIZATIONs*		Date of Immunization Times	Expected date	Date of Vaccination	
NEW BORN	BCG*	Does 1			
	HBV	Does 1			
2 MONTHS	BCG**	Not received at birth			
	ROTAVIRUS	Does 1			
	OPV	Does 1			
	PCV	Does 1			

	PENTAVALENT	Does 1			
4 MONTHS	ROTAVIRUS	Does 2			
	OPV	DOES 2			
	IPV	DOES 2			
	PCV	DOES 2			
	PENTAVALENT	DOES 2			
6 MONTHS	OPV	DOES 3			
	PCV	Does 3			
	PENTAVALENT	Does 3			
9 MONTS	JE	Does 1			
	MEASLES, RUBELLA	Does 1			
1.5 YEAR	PENTAVALENT	Does 4			
	JE	Does 2			
	MEASLES, RUBELLA	Does 2			
9 YEAR	HPV (CANCER)	Does 1			
10 YEAR	HPV (CANCER)	Does 2			

SECTION (8) MIGRATION OUT

No.	MO.1 Age (by YEARS and MONTHS) IF A CHILD IS UNDER 1 MONTH OLD, CODE "00"						MO.2 Sex 0 = Male 1 = Female 9= Don't know 8 = Refused	MO.3 How is this person related to you? 00 = Self 01 = Parent 02 = Husband/Wife 03 = Child 04 = Uncle/Aunt 05 = Brother/Sister 06 = Nephew/Niece 07 = Friend 08 = Cousin 09 = Other relative 99 = Don't know 88 = Refused	MO.4 When did this person leave this household? 1 = 1 to 3 months 2 = 4 to 6 months 3 = 7 to 9 months 4 = 10 to 12 months 5 = over 12 months 6 = Don't know 8 = Refused	MO.5 What is the MAIN reason he/she moved away? 01 = Work 02 = Education 03 = Family 04 = Marriage 05 = Insecurity 06 = Improved Security 07 = Land confiscated 08 = No reason 09 = Other 99 = Don't know 88 = Refused		
	Years				Months					Code		Other
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

SECTION (9) MORTALITY TABLE

If there is no person died in this household, please say "thank you so much" and end the interview. For each person in this household who died, please tell me the age, sex and cause of death. Please include very little babies that cried or showed signs of life but later died or are still born.

No.	DA.1 Age For both YEARS and MONTHS IF A CHILD IS UNDER 1 MONTH OLD DIED, CODE "00" 999 = Don't know 888 = Refused						DA.2 Sex 0 = Male 1 = Female 9 = DK 8 =Refused	DA.3 How is this person related to you? 00 = Self 01 = Parent 02 = Husband/Wife 03 = Child 04 = Uncle/Aunt 05 = Brother/Sister 06 = Nephew/Niece 07 = Friend 08 = Cousin 09 = Other relative 99 = Don't know 88 = Refused	DA.4 When did this person died? 1 = less 1 year ago 2 = 1 – 2 years ago 3 = 3 – 4 years ago 4 = 3 – 4 years ago 5= 4 – 5 years ago 66 = more than 5 years ago 99 = Don't know 88 = Refused	DA.5 Cause of Death *(List only one. If the answer is 08 = Other, write down specific cause in the beside column, otherwise skip it.)*			Remark
	Years				Mons					Code		Other	
1													01 = Diarrhea 02 = Malaria 03 = ARI 04 = Landmine 05 = Gunshot 06 = Pregnancy-Related Maternal Death (Women dies < 42 days after pregnancy, Abortion and Miscarriage) 07 = Neonatal Death (Newborn dies < 28 days old) 08 = Other 66 = Don't know 88 = Refused
2													
3													
4													
5													
6													
7													
8													
9													
10													

End time (use 24 hour time) : ☐☐ ☐☐