Bandarban HDSS, Bangladesh

**Brief Introduction**

The Bandarban Health and Demographic Surveillance System (HDSS) is established in 2 rural unions namely Kuhalong and Rajbila in north of Bandarban Sadar sub district of Bandarban district. The area is known to be endemic for malaria primarily due to *Plasmodium falciparum*. Bandarban. The total Bandarban district area is 4,479 km² and the population 292,900, which is situated at the south-east region of Bangladesh, one of the three hill districts of Chittagong Hill Tracts (CHT) of Bangladesh. It’s geographical coordinates are 22.20 ° N and 92.35° E. It is not only the remotest district of the country, but also is the least populated one. The Bandarban HDSS area is close to the border with Myanmar.

Although the two unions of the HDSS site are adjacent, they also have some contrasting features. Kuhalong is more forested and hilly, whereas Rajbila tends to have more rice fields. Kuhalong is closer to Bandarban town, which has a hospital, while Rajbila is more distant, requiring between one to two hours to drive to the hospital.
Initial demographic surveillance visit records 20,558 people. In Rajbila, there are 9,168 people in 2,105 households and one orphanage with 100 tribal children, and in Kuhalong, there are 11,390 people in 2,406 households. Residents of these unions are predominantly tribal people. Out of the 12 tribes found in the CHTs, 8 are represented: Marma, Tanchangya, Chakma, Tripura, Khyang, Bawm, Rakhaine and Mro. Marma (61%) majors in both the union while Bengali (20%) seconds. The majority of people in both unions are Buddhist. Amongst tribal people, the majority are Buddhist (98%) with a small fraction of Christians. Amongst Bengalis, most are Muslims (88%) with some Hindus and Buddhists. While most people in the region speak at least some Marma language and possibly Bengali to engage in local commerce, there is a 100% overlap between tribal ethnicity and the language spoken. Villages tend to be racially homogeneous with households of the same tribe living near each other. The age of the population is relatively young with an overall mean age of 25.8 years. The total age dependency ratio is 95.9% for Bengalis and 68.7% for tribal people. The sex ratio is not significantly different between Bengalis and tribal people at 101.9 and 97.8, respectively. More than 90% of males and females are married respectively by age 30 and 25. The overall mean and median age of pregnancy is 24.4 and 24 years old, respectively. The average household size in the surveillance region is 4.5 people. There are a greater fraction of households with females as household (HH) heads in the tribal population (10.5%) compared to the non-tribal population (7.38%). Around 40% of non-tribal women and 54-57% of tribal women received no formal education, compared with 26-28% of non-tribal males and 39-40% of tribal males, depending on the union. Tribal men and women entering school attend for 5.1-5.4 years and 4.8-4.9 years, depending on the union, compared with 4.8 years and 4.4 years for non-tribal men and women, respectively. The top four occupations reported are farming own land, daily labour, farming rented land/sharecropping, and an indigenous style of jungle hillside agriculture called “jum” cultivation. For people in the working ages of 15-59 years old, 2.5% of men and 5.6% of women are unemployed. Overall, men are primarily employed in agriculture (53.8%) and menial labour (20.9%), while women are employed in agriculture (40.9%) and as housewives (27.8%). The data analyzed here are taken to represent Kuhalong in December 2009 and Rajbila in June 2010.

![Age Pyramid](image-url)

**Figure 1. Age pyramid of the total population by sex in Bandarban HDSS**
Figure 2: Occupation by Union and Race

Other HH Dynamics Findings

Data upto July 2011 reveals that:

- Tube well water is the most common source of water.
- Major type of toilet is slab toilet with boundaries.
- Most common source of light is oil lamp.
- Major type of fuel is fire wood.
- Approx. 17% household has Radio.
- Approx. 13% household has TV.
- Approx. 31% has cell phone.
- Main material of the floor is mud.
- Main material of the wall is bamboo.
- Main material of the roof is straw/thatch.
- Thirty nine percent of household has 2 dwelling rooms.
- Fifty seven percent HH head has 0 years of education.
- Twenty three percent HH head has 0 years of education.
- Farming is the main occupation of HH head (49%).
- Fifty one percent of HH has average monthly income Tk. 3001.00 (US$ 42)to 5000.00 (US$69).
- Ninety five percent of children <5 years slept under bed net last night of interview.
**Background Objectives**

This demographically and geographically defined area near to the Myanmar border which is also hypoendemic for malaria is established in 2009 for malaria surveillance with the following objectives:

- Define the rates of symptomatic and asymptomatic malaria in the study area.
- Define risk factors for malaria using both active and passive surveillance.
- Establish a demographic surveillance system including a geographic information system as resources for future malaria epidemiologic studies.
- Understand the changing knowledge attitude and practices regarding various aspects of malaria.
- Validate diagnostic methods (microscopy and rapid diagnostic tests) with PCR as the gold standard.
- Understand the epidemiological patterns of gametocyte prevalence.
- Define the vectors which transmit malaria in this area.

**Objectives**

The primary purpose of this surveillance system is to establish epidemiological studies on malaria, to evaluate strategies for malaria control including new drugs and vaccines. Furthermore, it may support further research by generating relevant health, demographic and socioeconomic information for specific research, policies and programs.

**Priority research areas**

Infectious disease research, clinical trials, monitoring health equity, community led health care interventions, antibiotic resistance.

**Funders**

- Johns Hopkins Malaria Research Institute (JHMRI), Johns Hopkins School of Public Health (JHSPH)

**Collaborators**

- JHMRI, JHSPH
- Government of Bangladesh
- BRAC

**Key publications**

1. **Mapping hypoendemic, seasonal malaria in rural Bandarban, Bangladesh: a prospective surveillance.**
Research staffs visiting households