



-BUSJOF 6UJMJ[BUJPO BOE "TTPDJBUFE 'BDU  
(VMPNFLBEB %JTUSJDU 5JHSBZ 3FHJPO /PSU  
#BTFE \$SPTT 4FDUJPOBM 4UVEZ

Neguse Debesay <sup>1</sup>, Lalit Ingale <sup>2</sup>, Azeb Gebresilassie <sup>2</sup>

A cross-sectional study conducted in Alaba special district revealed that households have limited access to sanitation and hygiene information. It also informed the importance of communication and behavioral factors in the sanitation and hygiene information access and level of latrine utilization [17]. Another study conducted in rural community of Hulet Ejju Enessie district, showed that latrine coverage in 2006 was 90%, and most (61%) households with traditional pit latrines had utilizing latrines [18].

In Ethiopia, still the national open defecation rate in 2010 was 46% (53% rural, and 9% at urban) [16]. The proportion of households with private improved toilet facilities was only 8%, 14% in urban areas and 7% in rural areas [16]. According to 2011 WASH report, the total latrine coverage in Tigray was 87%, and the utilization rate was only 34% [19].

Latrine utilization practice of community can be affected by different factors such as socio-demographic factors, access to health information, behavioral factors, socio-economic and latrine conditions like bad smell, lack of privacy if the shelter is inadequate, childhood habits that are hard to break. For example, elderly or uneducated people in rural areas may find it difficult to get used to new technologies and may resist the adoption of new behaviors [5,16,20].

Therefore, studies conducted in different parts of Ethiopia showed that the latrine utilization level differ from region to region of the country and from district to district within the same region depending on many factors. In Tigray region, there is no available research conducted to assess the latrine utilization rate. Hence, this study was designed to assess the latrine utilization level and associated factors of rural community separately in Gulomekada district, Tigray region, Northern Ethiopia.

## Methods

### Study area

The Gulomekada district is located at 912 km North of Addis Ababa and about 135 km North East of the Tigray regional city, Mekelle. There are 19 villages, 17 rural and 2 small towns in the district. In 2012, the total population is about 98,302 (48,167 are male and 50,134 are female), and of whom 86,038 live in rural area and the rest 12,260 in urban areas. In this district, the total number of households is 18,539, and out of it 16,158 Households live in the rural villages [21]. The geographic feature and settlement of households in the district is suitable for latrine construction. This study was conducted from February 2013–July 2013.

### Study design

A community based cross-sectional study design was employed.

### Study population

Randomly selected kebeles of the rural community, and sampled households owned private latrine were the study population for this study.

### Sample size determination

The sample size was determined using single population formula with prevalence estimates of 34% (19), with a margin of error of 0.05% at the 95% confidence level. Then multiplying by a design effect of 2 and adding a 10% non-response rate, the total sample size was calculated to be 759.

### Inclusion criteria

In selected kebeles of the district, households owned private latrine were included in the study and family members of 18 and above years old were interviewed for the study.

### Exclusion criteria

Households who have not functional latrine were excluded from this study. The household with less than 18 years child were excluded from the study.

### Sampling technique and procedures

A proportional sample size was allocated according to the number of kebeles in each stratum. Finally, 10 kebeles were selected from the 30 rural kebeles in the district. After the study kebeles had been identified the households were selected by systematic sampling method using the existing list of all households (obtained from registration books of health extension workers in the selected kebeles) as a sampling frame. A multistage sampling technique was employed to select the sample households. 5 kebeles (the smallest administrative unit in Ethiopia) were selected by simple random sampling using lottery method out of the 17 rural kebeles of Gulomekada district. Then, the sample size (759) was allocated using proportional to population size (PPS) to each of the selected kebeles. Interval for selecting households was determined by dividing the number of households with the sample size allocated for each kebele. After determining the interval, the first household was selected randomly. The next households were identified systematically onwards by adding cumulative intervals to the first selected household.

### Study variables

In the present study, dependent variable is latrine utilization and the independent variables are age, sex, educational status, religion, occupation and marital status, monthly household income, access to health information for this study.

unlikely responses daily. The coded data was then entered, sorted and analyzed using Statistical Package of Social Sciences (SPSS) version 16.0. Descriptive statistics like frequency, distribution and percentage calculation were worked out for most of the variables. Bivariate and multivariate logistic regression analyses were performed to identify the factors affecting latrine utilization. Finally, 95% confidence interval (CI) and adjusted odds ratios (AORs) were computed in order to identify statistically significant associations between latrine utilization and associated factors. The level of statistical significance was set at  $P < 0.05$ . The goodness of fit of the final model was checked using Hosmer and Lemeshow test of goodness of fit considering good fit at  $P\text{-value} > 0.05$  level of significance.

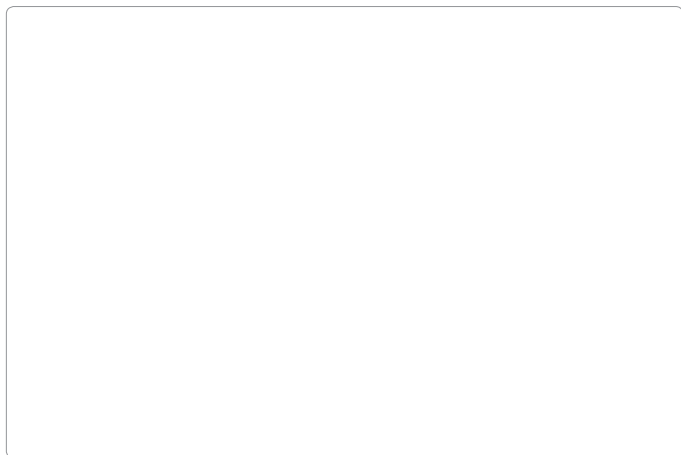
#### Ethical considerations

Ethical approval and clearance was obtained from the Institutional Review Board of College of Health Sciences, Mekelle University and Tigray Regional Health Bureau. Kebele administrators and interviewers were informed about the purpose of study, importance and duration of the study in order to get their free time and prior informed consent for the survey. Confidentiality was maintained and respondents were informed that participation was voluntary and they could withdraw at any time from the study. The right of participants to anonymity and confidentiality was ensured by making the questionnaire anonymous.

## Results

### Socio-demographic characteristics

A total of 756 households who have latrine were included in the study with 99.6% response rate. Of the total respondents 465 (61.5%) were males and 685(90.6%) of the respondents were head of the households. Men



95%CI: 1.96-3.85] more likely to utilize latrine than households who use locally available materials.

Concerning to latrine type, households owned pit latrine with pit cover were 7.86 times [AOR=7.86, 95%CI: 3.61-17.10] more likely to use latrine. The likelihood of using latrine was increased more and more by households owned VIP latrine. Regarding to construction year, households owned latrine for more than 3 years were 3.19 times [AOR=3.19, 95%CI: 2.04-4.98] more likely to use latrine (Table 4).

## Discussion

The findings of this study revealed that the rate of latrine utilization in rural community of Gulomekada district was about 57.3% similar with study commissioned in community of Hulet Ejju Enessie district, East Gojjam Zone, Amhara Region 60.7% [18] and differs from study done in Alaba and Mirab Abaya districts 93%, Ethiopia [4]. Result of this study is also comparable with Tigray 2011 baseline survey report on WASH, the utilization rate of latrine was 34% [19]. The disparity might be due to relatively better involvement of local Non-Governmental Organizations (NGO's) and governmental interventions. In the present study district, there is no organized and continuous Community Led Total Sanitation and Participatory Hygiene and Sanitation Transformation intervention carried out except the advice and education provided by health extension workers, local administrators and local NGO's (Catholic Church). The low use of latrines in our study area can be also explained health extension workers promote the benefits from constructing latrines among the rural communities, but have been less active in teaching proper utilization. Ending that,

type of latrine, years since latrine constructed, and latrine construction materials remained significant predictors of latrine utilization.

The households with husbands educational status of primary and above were 3.71 times [AOR=3.71, 95%CI: 1.52-9.09] more likely to utilize latrine than households with illiterate husbands. The households with school age children, all attending the school were 4.45 times [AOR=4.45, 95%CI: 1.32-14.97] more likely to use latrine than households without school age children. The households with high monthly income were 10.86 times [AOR=10.85, 95%CI: 8.09-15.44] more likely to utilize latrine than households with very low income. The households who use mixed materials (locally available and unavailable materials) for construction of latrine were 2.55 times [AOR=2.55,

Citation:

---

The likelihood of using a latrine was 10.86-fold higher in households that had a higher income than those with a lower income [AOR=10.85, 95%CI: 8.09-15.44]. This finding is in line with the results of a study conducted by Admassu M. in North Gondar, Ethiopia [24].

Regarding the latrine construction materials, households who use mixed materials (locally available and unavailable materials) for construction of latrine were 2.55 times [AOR=2.55, 95%CI: 1.96-3.85] more likely to utilize latrine than households who use locally available materials. This could be attributed to their income status.

Thus, households should be encouraged and enabled to improve the quality of their latrines. However, without being economically empowered to do so, many of the poor households, including many female-headed households will continue finding it difficult to adopt the measures since their financial positions may not permit them to do otherwise.

Since, the study has a limitation to formulate a casual association, recall bias and social desirability bias might have underestimated some of the findings.