

Underweight and Factors Associated Among Lactating Mothers In Dodata District, Arsi Zone, Oromia Regional State, Ethiopia,2021

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Research Article

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Abstract

Background: An underweight individual is a somebody whose body weight is considered too low (BMI <18.5) to be healthy. The similar idea applies to lactating mothers. However, little is known about underweight status among lactating women in the study area. The objective of study to assess incidence of underweight and related issues among lactating mothers in Dodota district of Arsi Zone, Oromia, Ethiopia, from February 1-28, 2021.

Method: The cross-sectional study design was done on 355 lactating mothers. The starata and simple random sampling technique were used. The structured questionnaire and anthropometric measurements were used. Data were entered and cleaned using Epi info version 7.1 and SPSS version 21 for analysis. Bivariate and multivariate analysis were done. Descriptive statistics were performed. The crude and adjusted odds ratio along with 95%CI were used to measure the strength of association. The level of statistical significance was declared at a p-value < 0.05.

Result: Study revealed (14.1) lactating mother were underweight. Rural areas, (AOR=2.5 [95% CI: (1.061, 6.302), the practice of food taboos (AOR= 2.3, [95% CI: (1.045, 5.084) and income level(AOR= 2.1[95% CI: (1.003, 4. 460) were found to be independent determinants of underweight among lactating mothers in the study area.

Conclusions: The prevalence of underweight among lactating mothers was lower.

Statistical Analysis

In the first stage, kebeles in the district were stratified into urban and rural-based on administration. Then from the stratum, one urban and four rural representative kebeles selected based on probability using simple random sampling techniques after a list of kebeles as the sampling frame. In the second stage, households with lactating mothers were identified and listed separately in each selected kebele through house-to-house visits by health extension workers.

A sampling frame was prepared by registering all the identified eligible lactating mothers in each selected sub-city. After that, lactating mothers selected proportionally allocated to each kebele based on the size. Finally, a systematic sampling technique was used to select the required number of lactating mothers.

The structured questionnaire was adapted from relevant literature and previous studies and modified based on the study variables and local context (24,25). The English version questionnaire was translated into regional working language (Afan Oromo) by a language expert to make sure that the questions are clear and can be understood by the respondents, and after that, it was translated back to the English version to maintain its consistency. The questionnaires consisted of six basic sections: socio-demographic characteristics, health service-related conditions, feeding practice, dietary diversity, household food security, and anthropometric measurements.

The dietary pattern of the lactating women was collected using sum of consumed food groups within 24 hrs by using 10 food groups. To measure the outcome variable, weight was measured using a portable digital weight scale, and height was measured using a wooden height-measuring board with a sliding head bar(33).

The data were collected by face-to-face interview technique using the adapted questionnaire for lactating mothers.

To measure the weight, women were requested to remove the shoe and wear light close. Data collectors were taken the weight of the study participant on the portable digital scale and the values were recorded to the nearest 100 gram or 0.1 kg. To measure height, women were requested to stand erect with their shoulder level, hands were at the side and their head, scapula, buttock, calve and heel will in contact with a vertical measuring board. The height was measured to the nearest 0.1 cm using a wooden height-measuring board with a sliding head bar following standard anthropometric techniques(4).

Body mass index of the women was calculated through weight in kilogram divided by square of height in meters and based on the result women were categorized into underweight with BMI less than 18.5 kg/m², normal those having BMI 18.5-24.99 kg/m², overweight with BMI 25-29.99 kg/m² and obese those having BMI greater than or equal to 30 kg/m² (2).

4.9.3 DATA COLLECTION PROCESS

A total of five health workers were involved in the data collection process. Two BSC Nurses from the health center were supervised and coordinated data collectors. Two days of intensive training were given regarding the objective of the study, procedures of anthropometric measurement, data collection tools, and interview methods by the principal investigator. The principal investigator and supervisors were following the activities every day to make sure the completeness of the questionnaires. The principal investigator was responsible for the overall data collection processes.

4.10 DATA QUALITY CONTROL

To assure the quality of the data, semi-structured and pre-tested questionnaires were used. Pretest of the questionnaire was employed before the actual data collection period to know the length, content, question-wording, and language understandability of the question among 5% (i.e., 18 Lactating Women) of the study sample on one kebele not included in this study. The data collectors and supervisors took two days of training by the principal investigator on the instruments, method of data collection, how to take anthropometric measurements, and ethical issues. The Standard Operating Procedure adopted from the WHO anthropometric measurement manual was used on how to measure correct height and weight (34). The weight scale was calibrated using known weight (Kg) and the height scale was calibrated using meter tape. Data collectors checked and assured the functionality of digital weight scales using known

weight every morning before data collection begins. It was checked using known weight and assuring it read exactly at zero. A respondent's weight and height were measured at least twice and more times when the difference between the two weight measures is greater than 0.1kg and when the difference between the height measures is greater than 0.1cm.

Daily the questionnaires were checked to ensure that whether they are correctly filled or not. Data entry for the questionnaire was performed to realize consistency in data entry and to correct mismatches by crosschecking. In addition, the quality of data collection was ensured through close supervision of the data collectors by the principal investigator.

After completion of data collection and processing, data were checked for completeness, clarity, and consistency. Then data were entered Epi data version 7 and SPSS version 21 for analysis. Binary logistic regression analysis was done to see the association between a dependent variable and each independent variable.

Since the interest was identifying lactating mothers at risk of underweight, the dependent variables were coded as 1 if lactating mother underweight (BMI <18.5 kg/m²) and coded as 0 if not. Multi Col-linearity effect checked and variables with SE >2 removed from the analysis and those variables that had no collinear effect were included in a binary logistic regression model to see the possible relationships with the outcome variables. Covariates with a p-value less than 0.25 in the bi-variable logistic regression analysis were a candidate for a multivariable logistic regression analysis for potential confounders and to identify risk factors associated with underweight. Odds Ratio along with 95% Confidence interval measures the strength of the association. Level of statistical significance declared at p-value less 0.05. The fitness of the model was tested by the Hosmer-Lemeshow goodness of fit test. Finally, results were presented using frequencies, summary measures, tables, and figures.

Results

A total of 355 respondents enrolled in the study with a response rate of 100%. The mean age and standard deviation of the respondents were (28.55±6.53) years (age ranged from 16 to 49 years). Out of the total respondents, about three-fourth(74.4%) lived in a rural area, 194 (54.6%) were Muslim followers, 310 (83.3%) were housewife,most of them (98.0%) were married.Three-fourth (75.5%) of the respondentswere literate (who were able to read and write). The family wealth of lactating mothers was assessed and the result showed that 137 (38.6%)of them had a low wealth index.Near to 3/4th(74.4%)of the mother had children less than one years of age.(1).

Table 1

Socio-demographic characteristics of the lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021

Variables (n=355)		Frequency	Percentage (%)
Age in years	16-25 years	132	37.2
	26-35 years	168	47.3
	>=36 years	53	14.9
	Mean±SD	28.55±6.53	
Place of Residence	Urban	91	25.6
	Rural	264	74.4
Religion	Orthodox	137	38.6
	Muslim	194	54.6
	Protestant	24	6.8
Marital Status	Married	348	98.0
	Divorced	3	0.8
	Separated	3	0.8
	Widowed	1	0.3
Education (Mother)	Unable to read and write	87	24.5
	Primary education	179	50.4
	Secondary and above	89	27
Occupation (Mother)	House wife	310	83.3
	Merchant	45	12.7
No. of Family members	< 5	173	48.7
	>= 5	182	51.3
Wealth Index	Low	137	38.6
	Medium	92	25.9
	High	126	35.5
Education (father)	Unable to read and write	57	16.1
	Primary education	161	45.4
	Secondary and above	137	38.6
Occupation (father)	Farmer	259	73.0
	Merchant	51	14.4

	Government employee	31	8.7
	Others	7	2.0
Age of child	< 5 Months	128	36.1
	6-11 months	136	38.3
	>=12months	91	25.6

Dietary patterns

Most (92.1%) of lactating mothers recalled that they consumed all starchy staples such as white potatoes, or any other foods made from roots or tubers, bread, kita, porridge, injera, spaghetti, kolo, rice, biscuits, or any other foods made from maize, millet, wheat, teff, barley, oat, and sorghum one day before the day of data collection. However, only 20(5.6%) of lactating mothers stated that they consumed any organ meat such as liver, kidney, heart, or other organ meats or blood-based foods, 76 (21.4%) of them consumed any eggs, and one-third (33.2%) of them consumed all dairy products such as milk or other milk products, cheese, yogurt one day before the day of data collection. Sixty-three(17.7%) of the respondents were restricted from specific food during lactation. Forty-two (11.8%) of them were food insecure (*Table 2*).

Table 2

Twenty-four (24) hours dietary diversity consumption pattern of lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021

Food groups	Categories	Frequency	Percentage (%)
Starch staples	Adequate intake	327	92.1
	Low intake	28	7.9
Legumes & Nuts	Adequate intake	235	66.2
	Low intake	120	33.8
Dairy	Adequate intake	118	33.2
	Low intake	237	66.8
Organ Meat	Adequate intake	20	5.6
	Low intake	335	94.4
Eggs	Adequate intake	76	21.4
	Low intake	279	78.6
Flesh Foods	Adequate intake	76	21.4
	Low intake	279	78.6
Vitamin-A rich foods	Adequate intake	187	52.7
	Low intake	168	47.3
Other fruits and vegetables	Adequate intake	149	85.4
	Low intake	206	14.6
Other Vitamin-A	Adequate intake	303	85.4
	Low intake	52	14.6
Food Security	Food secured	313	88.2
	Food Insecure	42	11.8
Number of meals per day	1	10	2.8
	2	41	11.5
	3	234	65.9
	4	62	17.5
	5	8	2.3
Food taboo dusing lactation	Yes	63	17.7

Maternal health service utilization related factors

Three hundred six (86.2%) of the study participants reported that they had attended Antenatal Care during their pregnancy of the last child and 101 (28.5%) of them visited four and more times health facility for the ANC service. About one-third (33.0%) of them had two and fewer years of birth intervals for their last pregnancy while 238 (67.0%) had three and more year's intervals.

Two hundred forty-five (69%) of them attended Postnatal Care. Regarding place of delivery, 240 (67.6) gave birth at a health institution. Most of the lactating mothers (91.3.0%) had five and fewer pregnancies. Almost half (51.0%) of the mothers got their first pregnancy when they were less than 20 years old while only 6.0% of them got their first pregnancy when they are above 25 years old. Eighty five (23.9%) of lactating mothers mentioned that they experienced illness in the past two weeks. Sixty-eight (19.2%) of them not received nutrition education, while 247 (86.1%) of them got information from health workers (*Table 3*).

Table 5.3

Healthcare practices of lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021

Variables (n=355)		Frequency	Percentage (%)
ANC visit	Yes	306	86.2
	No	49	13.8
No. of ANC visit	4 times and above	101	28.5
	3 times	113	31.8
	2 and less times	141	39.7
Place of Delivery	Home	115	32.4
	Health Facility	240	67.6
PNC for current child	Yes	245	69.0
	No	110	31.0
Birth interval (in Year)	<= 2	117	33
	>=3	238	67
Illness in the past 2 weeks	Yes	85	23.9
	No	270	76.1
No. of Pregnancy	1-5	324	91.3
	>= 6	31	8.7
Age at first pregnancy (years)	15-19	181	51.0
	20-24	153	43.0
	>= 25	21	6.0
Nutrition Education	Yes	287	80.8
	No	68	19.2
Nutrition information source	Health workers	247	86.1
	Media	28	9.8
	others	12	4.1

5.4. Hygiene and sanitation related factors

Regarding the availability of latrines, 28 (7.9%) had no access to a toilet facility. Twenty-two (6.2%) of them not used to wash their hands after toilet use. Similarly, 15 (4.2%) of lactating mothers not wash their hands before preparing food and before eating. Eighty-three (23.4%) of the lactating mothers not use potable water for drinking and about 240 (67.6%) respondents were disposing of household waste in the open field (Figure 5.1).

5.5. Prevalence of Underweight among Lactating Mothers

The prevalence of underweight was 14.1% (95% CI: 10.7, 18.0). The mean weight, height, and BMI were 54.82 ± 7.70 , 1.61 ± 6.87 , and 21.09 ± 2.62 respectively (Table 5.4).

Table 5.4

Anthropometric measurement of lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021

BMI, kg/m ²	Classification of BMI	Frequency	Percentage (%)
< 18.5	Underweight	50	14.1
>= 18.5	Not Underweight	305	85.9
Parameter	Mean (\pm SD)		
Weight (kg)	54.82 \pm 7.70		
Height (m)	1.61 \pm 6.87		

BMI (Body Mass Index)(kg/m²)

Factors associated with lactating mother's nutritional status

The binary logistic analyses revealed that age of the mothers, total number of pregnancies, age at first pregnancy, the residence of the mothers, the birth interval between current and previous child, wealth index, dietary pattern had a P-Value of <0.25. After tested for the effects of multicollinearity, model fitness test and adjusted for the confounders; residence, food taboos, and wealth indexes of the mothers persisted as significant determinants of underweight among lactating mothers in the study area. Hence, mothers who live in the rural areas had higher (AOR=2.5 [95% CI: (1.06, 6.30)] odds of being underweight as compared to those who live in the urban. Besides, the odds of being underweight was higher for mothers who practice food taboos (AOR= 2.3, [95% CI: (1.05, 5.08)] compared to their counterparts. On the other hand, mothers who were in the lower wealth index category were more than 2 times (AOR= 2.1 [95% CI: (1.00, 4.46)] to be underweight compared to those mothers who were in the highest wealth index (Table 5).

Table 5.5

Factors associated with nutritional status on bivariate logistic regression analysis among lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021

Variables	Nutritional Status		COR(95% CI for exp(B))	AOR(95% C.I. for EXP(B))
	Underweight	Normal		
	n(%)	n(%)		
Residence				
Urban	7(14.0)	84(27.5)	1	1
Rural	43(86.0)	221(72.5)	2.3(1.011,5.394)	2.5(1.061, 6.302)*
Birth interval				
< 2 years	10(20.0)	107(35.1)	1	1
>= 2 Years	40(80.0)	198(64.9)	2.1(1.040,4.493)	1.7(.818,3.728)
Food taboos				
Yes	14(28.0)	49(16.1)	2.0(1.020,4.046)	2.3(1.045,5.084)*
No	36(72.0)	256(83.9)	1	1
Wealth index				
Lower	27(54.0)	110(36.1)	2.1(1.047,4.348)	2.1(1.003, 4.460)*
Medium	10(20.0)	82(26.9)	1.0(.443,2.535)	1.06(0.421,2.676)
Higher	13(26.0)	113(37.0)	1	1
Dietary diversity				
Inadequate	16(32.0)	68(22.3)	1.6(.854, 3.150)	1.5(.808, 3.132)
Adequate	34(68.0)	237(77.7)	1	1
History of ANC				
No	9(18.0)	40(13.1)	0.6(.311,1.522)	0.7(.270,1.869)
Yes	41(82.0)	265(86.9)	1	1
PNC				
No	16(32.0)	94(30.8)	0.9(.498,1.799)	1.1(.535,2.471)
Yes	34(68.0)	211(69.2)	1	1
Experience illness				
Yes	11(22.0)	74(24.3)	0.8(.429,1.806)	0.6(.292,1.657)
No	39(78.0)	231(75.7)	1	1

Discussions

In this study, 14.1% of lactating mothers were underweight. The study finding is lower than the study conducted in Ambo (21.5%)(21) and the prevalence of underweight among lactating mothers in Nekemte(20%)(22), and Southern Ethiopia(17.4%)(26). But it was comparatively closer to the study conducted in Addis Ababa, (12.7%)(36). On the other hand, it was much lower than the study findings from Jimma zone, (40.6%)(37), the mini-review prevalence of underweight among lactating mothers in Northern Ethiopia(50.6%). However, it was comparatively higher compared to the study conducted in Uganda, (8.2%)(43). The difference might be because of the differences in the study settings, interventions on maternal nutrition, health and care practices by governmental and non-governmental organizations in the study area.

In this study, Rural residence of the participants was significantly associated with maternal underweight of which mothers residing in rural areas had higher odds of being underweight compared to those who live in urban areas. The finding is similar to a study that identified positive associations between rural residential areas and increased risk of underweight among lactating mothers living in the Moyale district of Borana Zone(18). The reason could be mothers living in rural areas may be exposed to labor-intensive jobs that increase their energy expenditures. Labor-intensive work was identified as a significant determinant of underweight among lactating mothers in Uganda(43).

Family wealth index was another significant determinant of underweight among lactating mothers in the study area. The wealth index of the lactating mother was found as the major contributors of mothers' dietary practices in Ethiopia and while income level which might be related to the wealth index was found to be positively associated with increased risk of being underweight among lactating mothers in Ethiopia(33).

Mothers who practiced food taboos during lactations were more likely to be underweight as compared to those who did not practice abstaining from some kinds of food while lactating their children. The study result conforms to study findings that observed food taboos among a specific segment of populations living in Arsi Zone and dominant among populations living in rural areas(39). Food taboos can result in inadequate dietary intakes that could result in adverse consequences including maternal underweight(40)

Abbreviations

ANC AnteNatal Care

BMI Body Mass Index

CSA Central Statistical Agency

DDS Dietary Diversity Score

DHS Demographic and Health Survey

EDHS Ethiopian Demographic and Health Survey

FAO Food and Agriculture Organization

FMOH Federal Minister of Health, Ethiopia

HEW Health Extension Worker

MCH Maternal and Child Health

NGOs Non-Governmental Organizations

NNP National Nutrition Program

PI Principal Investigator

PNC Post Natal Care

UNICEF United Nation International Children's Emergency Fund

WHO World Health Organization

Limitation Of The Study

- ☞ Due to the cross-sectional nature of the study design, it is difficult to establish a causal relationship between under weight and independent variables.
- ☞ Seasonal variation in food consumption might exist so that results regarding dietary information are only limited to the specific season of the year in which the study were conducted.
- ☞ Since some question asks about past events, recall bias may occur.

Conclusion

The prevalence of underweight among lactating mothers was lower compared to EDHS findings. Area of residence, family wealth index, and food taboos during lactations were found to be independent determinants of underweight among lactating mothers in the study area.

Recommendations

For Government sectors

- Income-generating activities that targeted mothers in the lowest wealth index should be considered.

For health care providers

- Behavioral change communications and nutritional counseling on the food diversity and food taboos should be provided. Special focuses required for mothers living in rural areas and those who are in the low wealth category.

For the participants

- Lactating mothers should consume a variety of diets that should strengthen their health and that of their children without fear of unrealistic consequences.

For researchers

- Further study that triangulated with a qualitative study is essential to explore the factors associated with food taboos and other contributors of underweight among lactating mothers.

Declarations

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ETHICAL CONSIDERATIONS:

Ethical clearance was obtained from the Institutional Health Research Ethics Review Committee (IHRERC) of the college of public health, Adama Hospital Medical College. A written permission letter was obtained from Arsi zonal Health department. For all study participants, information was given about the study before the data collection on its possible risk, benefit, confidentiality, privacy, voluntary activity, right of withdrawal, and the time the questionnaire will take. Then informed, voluntary, written, and oral consent was obtained from each participant. Personal identification was not written on the questionnaire and confidentially of all information was kept. When mothers were found as underweight during data collection, counseling was provided about feeding and then linked to HEWs for SFP.

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Figures

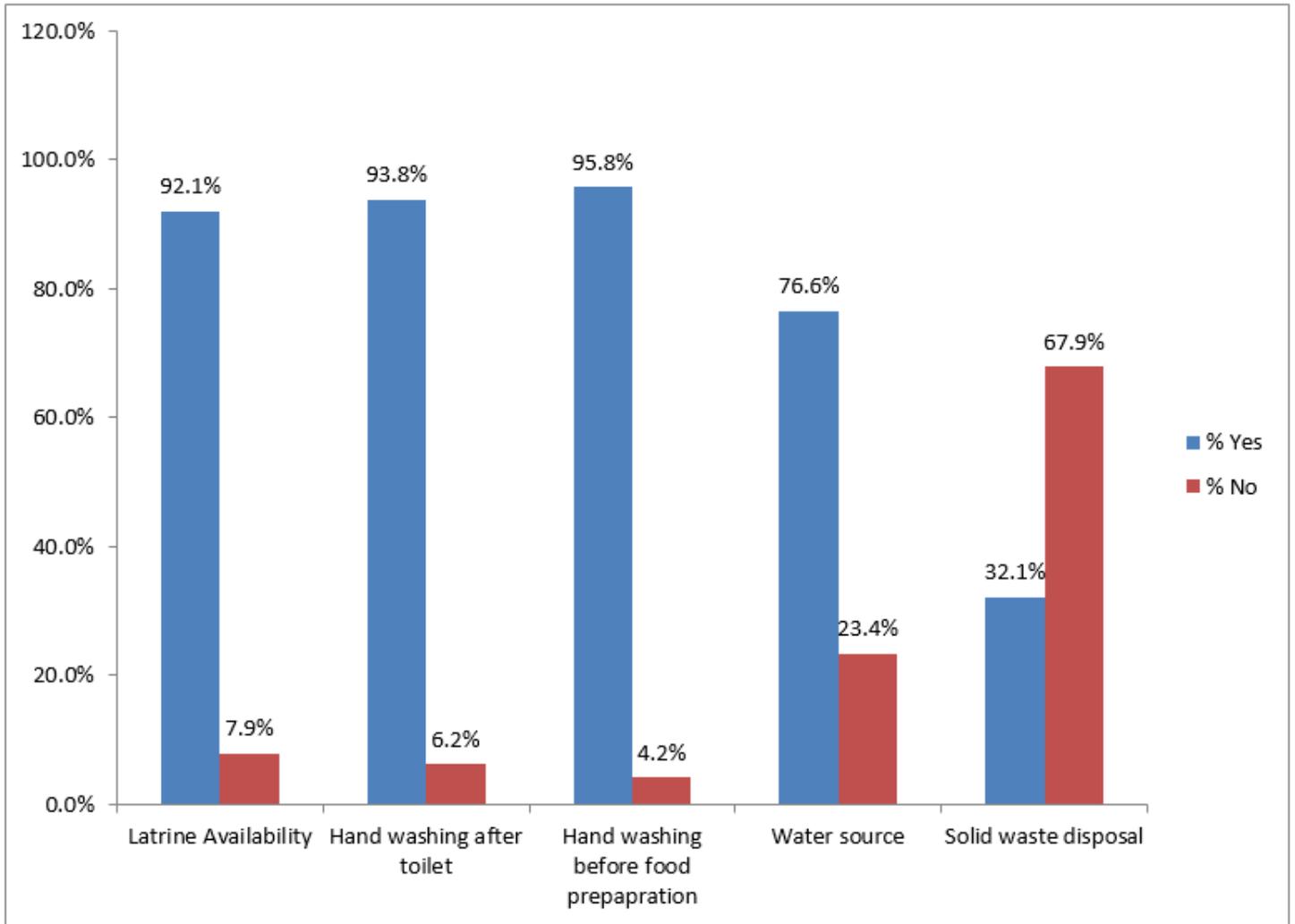


Figure 1

Hygiene and sanitation conditions of lactating mothers in Dodota district, Arsi, Oromia region, Ethiopia, 2021