CONTENTS

ACRONYMS

ANC	Antenatal Care
ASFR	Age Specific Fertility Rate
ASMR	Age Specific Mortality Rate
CBR	Crude Birth Rate
CDR	Crude Death Rate
DHSS	Demographic and Health Surveillance System
DRC	Dabat Research Center
EDHS	Ethiopian Demographic and Health Survey
EPI	Expanded Program on Immunization
GFR	General Fertility Rate
GRR	Gross Reproduction Rate
IUD	Intrauterine Device
TFR	Total Fertility Rate
U5MR	Under five Mortality Rate

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ORIGINAL ARTICLE

DEMOGRAPHIC AND HEALTH SURVEY AT DABAT DISTRICT IN NORTHWEST ETHIOPIA: REPORT OF THE 2008 BASELINE SURVEY

Takele Tadesse[1], Assefa Getachew[2], Mengesha Admassu[1], Yigzaw Kebede[1], Tadesse Awoke[1], Tesfahun Melese[1], Solomon Amsalu[2], Shitaye Alemu[2], Gashaw Andargie[1] , Belaynew Wassie[1], Yifokir Tefera[1], Sisay Yifru[2], Kassahun Alemu[1], Samuel G/ Selassie[1] , Solomon Meseret[1]

ABSTRACT

Background: *Vital events registration system is totally absent in Ethiopia where health and development problems are most pressing. Demographic and Health Surveillance System is a response to lack of a valid information base that can provide high-quality longitudinal data on population dynamics, health, and social change to inform policy and practice.*

Objective: *This study aimed to provide baseline information on demographic and health related characteristics of the population.*

Method: *A community-based cross-sectional study was carried out at Dabat district in Northwest Ethiopia. All households located in ten randomly selected Kebeles were included in the study. Trained field workers visited each household and collected the data using a pre-tested and structured questionnaire through face to face interviews. Descriptive statistics was calculated for most variables in the study using the STATA version 11.0 statistical package.*

Result: *A total of 45,640 people lived in seven rural and three urban kebeles. There were 9,526 households with an average household size of 4.8. The male to female ratio of the study population was 1:1.04. About 45.4 % of the study subjects were in the age group of less than 15 years. Crude birth and death rates of the study area were 27.4 and 5.9 per 1000 live births, respectively. The total fertility rate was 4.7. Infant and under-five mortally rates were 39.2 and 57.6 per 1000 live births, respectively. Antenatal care coverage was 51 % and the prevalence of contraceptive use among married women was 19.2 %. Only 7.2 % of the deliveries took place in health institutions, and only 7.85% of the births were attended by skilled professionals. The mean age at first marriage was 16 ±2.8 years with 25.9% of the women married at 14 years or younger and 77.3% were married before they reach 18 years of age. The average water consumption per capita per day was 20 liters. Only 39 % of the households had latrine.*

Conclusion: *The age distribution and sex composition of the study population almost matches the national figures. Infant and under five mortally rates had significantly decreased but contraceptive prevalence rate is still low. The current rates of progress on environmental health services were far from the Millennium Development Goals target. Thus among other things, strengthening the health extension program is recommended*

Key words: *Demography; Health; Survey; Dabat District; Ethiopia.*

[1] Institute of Public Health, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia
[2] School of Medicine, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia

Dabat Research Centre staff with Professor Mengesah Admassu, President of the University of Gondar (4th right to left).

INTRODUCTION

Ethiopia is situated in the horn of Africa between 3 and 15 degrees north latitude and 33 and 48 degrees east longitude. The altitude ranges fom110 meters below sea level to the highest peak of 4,550 meters above sea level. The climatic condition of the country varies with the topography and temperatures as high as 47 degrees Celsius in the Afar depression and as low as 10 degrees Celsius in the highlands. The total area of the country is about 1.1 million square kilometers. The current population is approximately 73,918,505 with an average annual growth rate of 2.6 percent. Out of the total population 37,296,657 (50.5%) are male and 36,621,848 (49.5%) female with the male to female sex ratio of 1:1.02. About 85% of the population lives in rural areas of the country [1,2].

The major public health problems of the country are communicable diseases. Evidences suggest the leading causes of outpatient morbidity are malaria, helminthiasis, acute respiratory infections, dysentery, tuberculosis and pneumonia [3]. In terms of tuberculosis prevalence the country ranks seventh among the world's 22 high-burden countries, with the highest estimated incidence and prevalence of 261 and 394/100,000 population per year, respectively [4]. Ethiopia is one of the Sub-Saharan countries hard hit by the HIV/AIDS pandemic. In 2008, the estimated adult HIV prevalence was 2.2 %, of which 10.1% was in urban and 1.1 % in rural areas [5].

The primary health service coverage of the country is 89.6 percent. According to reports, the Expanded Program on Immunization (EPI) coverage of the country has reached 81.0 percent. The immunization coverage of under one-year children for Pentavalent3 and measles are 81.0 and 72.2 percent, respectively. The percentage of fully immunized children is 62.6 percent. The antenatal coverage and hospital delivery rates are 59.4 % and 20.3 %, respectively. The health staff to population ratio is 1:37,996 for doctors, 1:63,785 for health officers and 1:4,725 for nurses. The total fertility rate (TFR) for the country is 5.3 births per woman. The TFR in rural areas is 6.0, two and half times higher than the TFR in urban areas (2.4). The under-5 mortality rate is 123 deaths per 1,000 live births. Sanitation-and hygiene-related diseases are among the most common deadly diseases in Ethiopia. In urban slums and rural areas alike, the majority of the population does not have access to sufficient and safe sanitation facilities [6,7].

Regarding health information system in the country, vital registration system is generally lacking posing a significant challenge to the development of effective health policies and programs. Accurate statistics on basic demographic events and health outcomes are fundamental for rational public policy. In Sub-saharan Africa, for example, fewer than ten countries have vital registration systems that produce usable data [7]. Traditional health information collected from health facilities often serve as the basis for health-services planning and allocation of resources in many developing countries. Yet, health-facility-based data provide only fragmentary and biased information. Not all population groups have geographic or economic access to health facilities. Thus, health-facility-based data are not representative of the health problems of all rural and urban communities and do not, therefore, reflect their health status. This gap in health information for a large segment of the world's population makes it difficult for policy-makers to formulate rational health policies to improve the health of their people [8].

Census and demographic and health survey at population level as well as antenatal care (ANC) sentinel surveillance at facility level are few of the available demographic and health data sources in Ethiopia. However, such sources of information may not address important health and demographic indicators for timely evidence-based decision making. Reliable data on basic demographic events and health outcomes, like trends in mortality and burden of disease remain hidden. This great void in population-based information constitutes a major and longstanding constraint on the articulation of effective policies and programs to improve the health of the poor and thus perpetuates profound inequities in health [9].

Ideally, reliable demographic and health information should be population based, inclusive of all groups, and collected continuously. This can be best met through Demographic and Health Surveillance System (DHSS) that collect demographic and health related data in a geographically defined populations. Within DHSS a geographically defined population is under continuous demographic monitoring, with timely production of data on all births, deaths, pregnancy outcomes, marriage, in and out migrations, and other related variables. This monitoring system provides a platform for a wide range of health-system innovations, as well as social, economic, behavioral and health interventions [8,10,11].

Cognizant of the lack of reliable ongoing population based data, currently in Ethiopia, six university-based DHSS sites are established to generate continuous demographic and health related information

to support evidence based decision-making and enhance the integration of training, service and research among public health professional trainees at different levels. The Dabat Research Centre (DRC) is one of these sites initiated in 1996 with the objective of generating longitudinal data on health and population at district level, and providing a study base and sampling frame for community-based research. The first baseline survey was conducted in November 1996 which was published as a special issue in the Ethiopian Journal of Health Development [12]. The current report/paper includes the report of the second baseline survey conducted in 2008. During the second baseline survey some more sites were included. Like that of the first survey, the second baseline survey aimed at assessing demographic and health related characteristics of the population at Dabat district in northwest Ethiopia.

METHODS

Study design:

A community- based cross-sectional survey was carried out from February to April, 2008.

Study area:

This survey was conducted at Dabat district located in northwest Ethiopia (Figure 1). Based on reports published by the Central Statistical Agency in 2007, the district has an estimated total population of 145,458 living in 27 rural and 3 urban Kebeles (The smallest administrative units in Ethiopia). Altitude ranges from about 1000 meters to over 2500 meters above sea level. Similar to the rest of the districts in North Gondar Zone, the local communities largely depend on subsistence agriculture economy. The district has two health centers, three health stations, and twenty-nine health posts providing health services for the community. An all-weather road runs from Gondar town through Dabat to some towns of Tigray [1].

Source and study population

Source population:

All permanent residents of the 30 kebeles of Dabat district.

Study population:

All permanent residents of the selected seven rural and 3 urban kebeles.

Selection of kebeles:

Dabat district was initially selected purposively for its unique three climatic conditions, namely Dega (high land and cold), Woina dega (mid land and temperate) and Kolla (low land and hot). The choice was made with the assumption that there would be differences in morbidity and mortality in the different climatic areas**.** Accordingly seven kebeles from Dega , one kebele from Woina dega, and two kebeles from Kolla were selected randomly after stratification of the kebeles by climatic zone. The seven selected kebeles were rural and the remaining 3 urban. The low land rural kebeles were Arebur and Bera. Talakmesk was the only rural kebele representing the midland. Benker, Tenseye, Dequa, and Chila were also rural kebeles representing the highland. The 3 urban kebeles of Dabat town (kebele 01, 02, and 03) were all highlands.

Data collection:

Data was collected using a pre-tested and structured questionnaire. The questionnaire included: basic demographic, socio-economic, fertility, mortality, maternal and child health, environmental health, morbidity, in and out-migrations and injury data. A complete zoning and mapping of the survey site was done before data collection was started. Data was collected from the households by 10 trained and full-time field workers who had completed high school and were living in the district, and three supervisors were deployed to monitor the data collection process. Interviews were made with family heads and women who were between 15-49 years of age. Data quality was maintained via intensive training of field workers and supervisors, pre-testing of data collection tools, close supervision by resident supervisors and principal investigators. Cross-checking was made for five percent of the questionnaire each day during data collection.

Data processing and analysis:

Data consistency and completeness was checked by supervisors during collection, and by data clerks and the data manager during entry. Incomplete questionnaire was sent back to the site and refilled. Data entry was done using the DRC software which was developed using Visual Basic as an interface and Microsoft Access as a database. The data was exported to STATA version 11.0 statistical package for analysis. Frequencies, proportions, rates and ratios were calculated for most variables in the study.

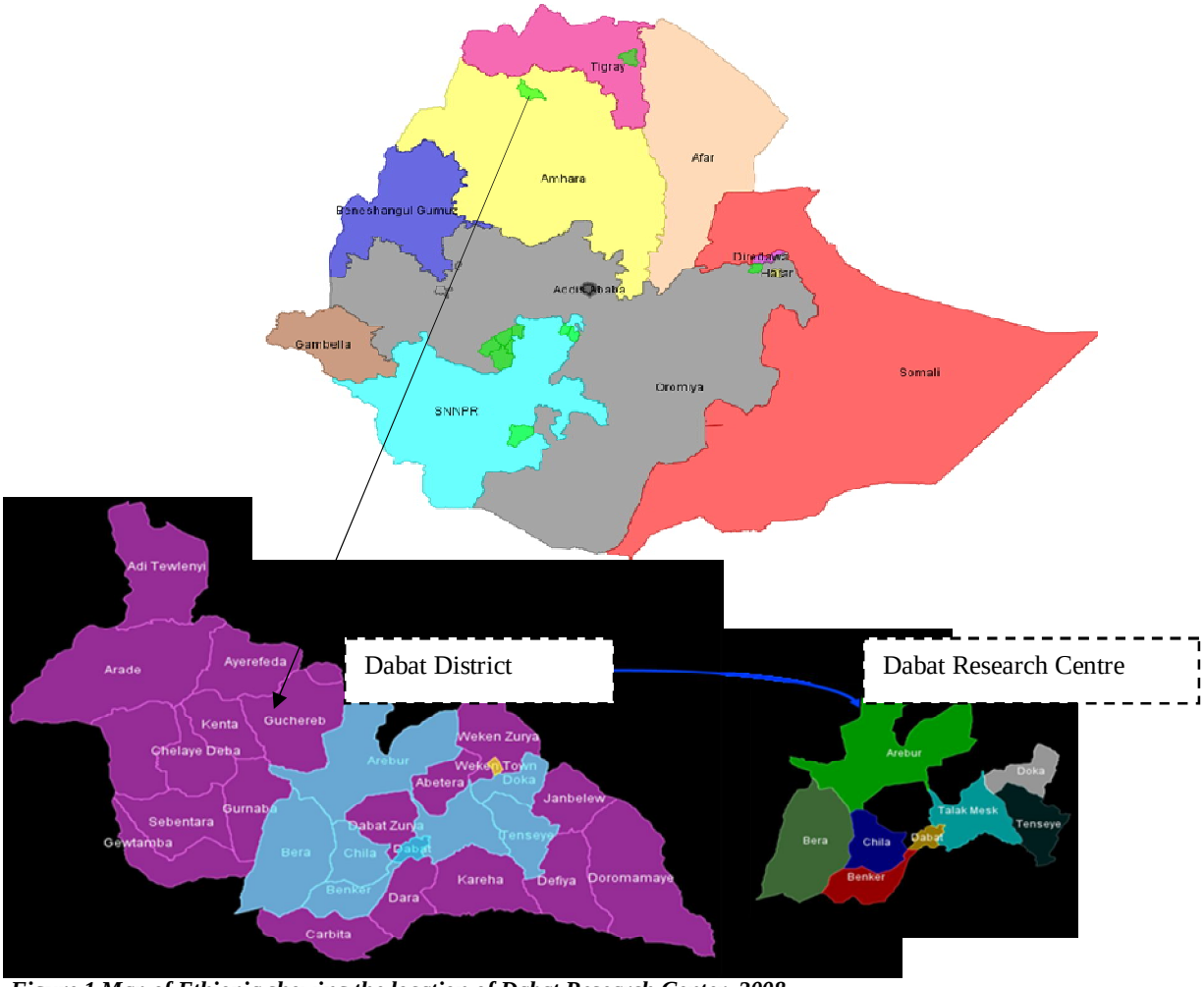

Figure 1.Map of Ethiopia showing the location of Dabat Research Center, 2008

Figure 2: Dabat Research Centre team members supervising field data collection processes, 2008

Ethical considerations

The study protocol was reviewed and approved by the Institutional Review Board of the University of Gondar. Written permission was obtained from North Gondar Zonal Health Office and Dabat District Health Office. Informed verbal consent was obtained from the respondents after a full explanation about the project including the purpose of the study. The freedom of each participant to withdraw at any time during the interview was guaranteed. Data confidentiality was assured by making the data accessible only to the research team and by locking the questionnaire in a box. Participants found sick were referred to the nearby health institution for medical care.

Figure 3: Dabat Research Centre data managing staff,2008

RESULTS

Socio-demographic characteristics

A total of 45,640 people lived in seven rural and three urban Kebeles of the study area. Out of the total population in the study area, 35,894 (78.6 %) were from the rural area. There were 9,526 households with an average household size of 4.79 persons. About 49 % (22,378) were male and 51 % (23,262) were female, with male to female ratio of 1:1.04. The mean age of the study population was 22 ±18.3 years. Population size decreased with an increase in age which was higher for rural population than urban areas. The difference in population size between the urban and rural areas got decreased as age increased.

While there were a total of 1355 (3.0% of the total population) infants under one year of age, children under the age of 15 constituted 45.4% of the total population.. The majority, 99.9 % (45579) of the study population were Amhara by ethnicity. About 97% (44250) of the study subjects were Orthodox Christians. Among the study population 32.2% (14682) were married and 28.8% (13153) single. Regarding the educational status of the study subjects, about 34.1% (15577) were unable to read and write. Ten thousand nine hundred and thirty-seven (23.96 %) were students and 17.24 % (7870) were farmers. The majority of the study participants were from Arebur kebele followed by Talak Mesk kebele. Their socio-demographic characteristics are shown in Table 1 and Table 2.

Table 1: Distribution of the study population by residence and selected socio- demographic variables at Dabat district in northwest Ethiopia, 2008 (n=45, 640)

	Residence				
	Rural		Urban		
Variable	Number	%	Number	%	Total (%)
Sex					
Male	18246	51	4132	42	22378 (49)
Female	17648	49	5614	58	23262(51)
Ethnicity					
Amhara	35885	99.97	9694	99.95	45579(99.98)
Tigrie	9	0.03	52	0.05	61(0.02)
Religion					
Orthodox	35549	99.04	8701	89.28	44250 (96.9)
Muslim	341	0.95	1037	10.64	1378(0.02)
Others	4	0.01	8	0.08	12(0.08)
Marital status					
<10 years	12297	34.26	2404	24.67	14701(32.21)
Married	11895	33.14	2787	28.60	14682(32.17)
Single	9860	27.47	3293	33.79	13153(28.82)
Divorced	879	2.45	725	7.44	1604(3.51)
Widowed	963	2.68	537	5.51	1500(3.29)
Education status					
<7 years	8680	24.18	1672	17.16	10352(22.68)
Unable to read & write	13752	38.32	1825	18.72	15577(34.13)
Read and write	2167	6.04	448	4.60	2615(5.73)
Primary School	9654	26.89	3122	32.03	12776(27.99)
Secondary and Above	1641	4.57	2679	27.49	4320(9.47)
Occupation status					
<10 years	11149	31.06	2175	22.32	13324(29.19)
Student	8188	22.81	2749	28.21	10937(23.96)
Farmer	7628	21.25	242	2.48	7870(17.24)
House wife	5873	16.36	1147	11.77	7020(15.38)
Shepherd	1242	3.46	18	0.19	1260(2.76)
Govt. employee	212	0.591	986	10.12	1198(2.63)
Unemployed	421	1.173	588	6.03	1009(2.21)
Daily laborer	194	0.54	706	7.24	900(1.97)
Merchant	16	0.045	615	6.31	631(1.38)
Others	971	2.705	520	5.34	1491(3.27)
Age group					
0-4	6249	17.41	1184	12.15	7433(16.3)
5-9	5505	15.34	1098	11.27	6603(14.5)
10-14	5329	14.85	1349	13.84	6678(14.6)
15-19	4340	12.09	1444	14.82	5784(12.7)
20-24	2951	8.22	902	9.25	3853(8.44)
25-29	2182	6.08	742	7.61	2924(6.41)
30-34	1846	5.14	609	6.24	2455(5.38)
35-39	1665	4.64	546	5.60	2211(4.84)
40-44	1148	3.20	368	3.78	1516(3.32)
45-49	1114	3.11	343	3.52	1457(3.19)
50-54	1018	2.84	287	2.95	1305(2.86)
55-59	740	2.06	255	2.62	995(2.18)
60-64	643	1.79	221	2.27	864(1.89)
65+	1164	3.23	398	4.08	1562(3.42)

Table 2: Distribution of the study population by kebele and climatic zone, Dabat district, 2008

	Kebele	Climatic zone			Total
		Low land	Mid land	High land	
Rural Kebeles	Arebur	7507	-	-	7507
	Bera	4513	-	-	3513
	Talakmesk	-	5435	-	5435
	Benker	-	-	4666	4666
	Chilla	-	-	4648	4648
	Dequa	-	-	4835	4835
	Tenseye	-	-	4290	4290
	Rural total	**12020**	**5435**	**18439**	**35894**
Urban Kebeles	Dabat Kebele 01	-	-	4593	4593
	Dabat Kebele 02	-	-	2805	2805
	Dabat Kebele 03	-	-	2348	2348
	Urban total	-	-	**9746**	**9746**
Urban + Rural total		**12020**	**5435**	**28185**	**45640**

The population size is very high for the under five children and showed a relatively slow decrease up to the age group of 15-19 years. However it decreases significantly after the age of 15-19 years. There were 20714 people below 15 years of age constituting 45.4% of the total population. Twenty-three thousand three hundred and sixty four (51.2%) were between the ages of 15 and 64. Only 3.4 % (1,562) were above 64 years of age (Table 1 and Figure 4). The total, child, and aged dependency ratios were 95.3%, 88.7% and 6.6%, respectively.

Measures of fertility

The average age at first marriage was 16.1 ±2.9 years. Four thousand forty eight (63 %) of the women got married at the age of 15-19 years (Figure 5). The child-women ratio for rural and urban residents was found to be 827.3 and 398.8 children per 1000 women of reproductive age, respectively. The crude birth rate (CBR) of the study area was 27.4 per 1000 population with the general fertility rate of 118.8 per 1000. The maximum age specific fertility rate (ASFR) was observed in the age group of 25-29 (206.4 per 1000), while the smallest rate was observed in the age group of 45-49 (21.1 per 1000). The total fertility rate (TFR) and gross reproduction rate (GRR) were found to be 4.68 per woman and 2.47 per woman, respectively (Table 3).

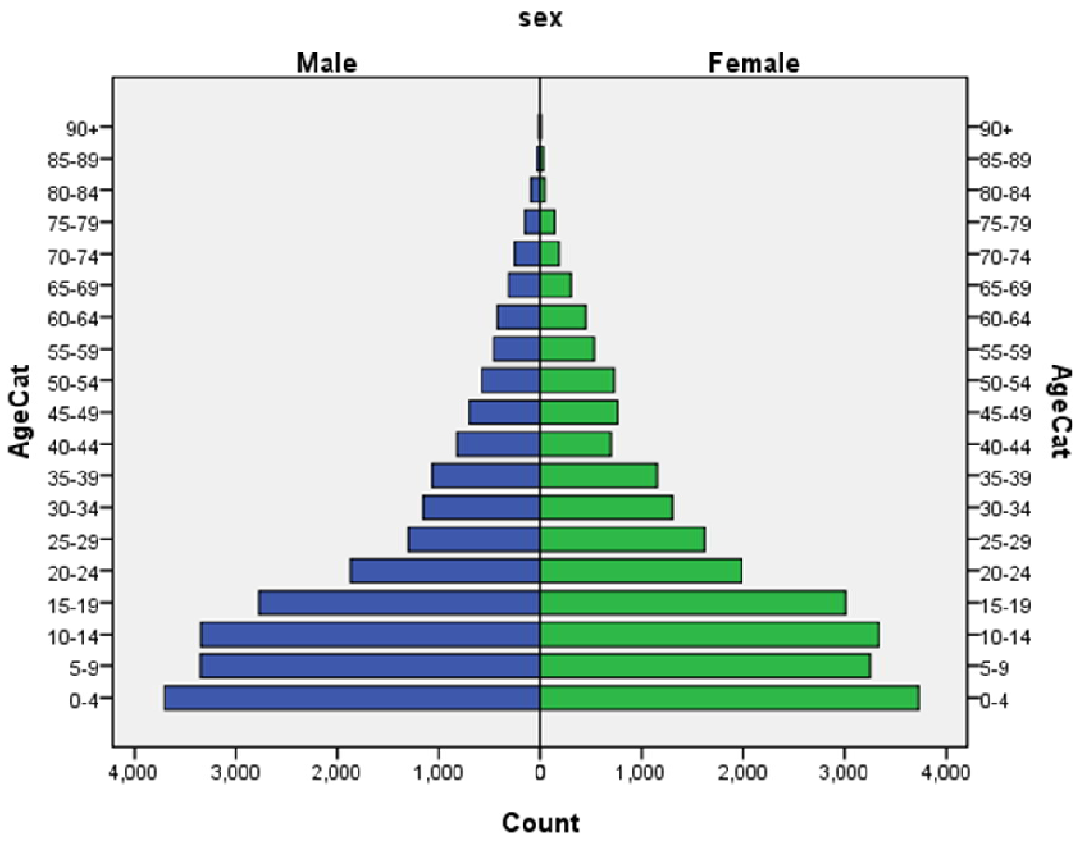

Figure 4: Population pyramid of the study population at Dabat district in northwest Ethiopia, 2008

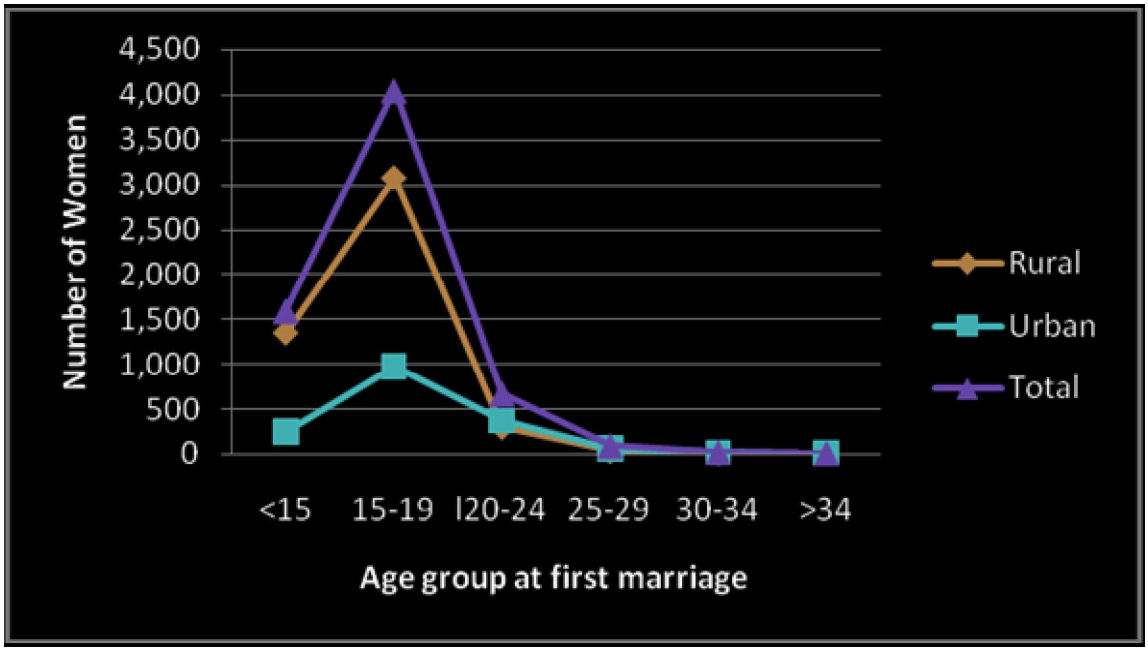

Figure 5: Distribution of residence by age group at first marriage at Dabat district in northwest Ethiopia, 2008

Table 3: Age specific fertility rate of women age 15-49 at Dabat district in northwest Ethiopia, 2008

Age group of mothers	Number of mother			Number of live birth			Age specific fertility rate (per 1000)		
	Rural	Urban	Total	Rural	Urban	To-tal	Rural	Urban	Total
15-19	2,141	869	3,010	130	34	164	60.71929	39.12543	54.48505
20-24	1,416	568	1,984	250	57	307	176.5537	100.3521	154.7379
25-29	1,167	456	1,623	280	55	335	239.9314	120.614	206.4079
30-34	943	355	1,298	200	29	229	212.0891	81.69014	176.4253
35-39	826	323	1,149	120	22	142	145.2785	68.11146	123.5857
40-44	494	204	698	52	5	57	105.2632	24.5098	81.66189
45-49	566	194	760	15	1	16	26.50177	5.154639	21.05263
Total	7,553	2969	10,522	1047	203	1250	138.6204	68.37319	118.7987
						TFR	5.524786	2.539654	4.685775
						GFR	138.6204	68.37319	118.7987
						GRR	2.918058	1.313614	2.466592

Measures of mortality

There were a total of 268 households which reported deaths in their family within the proceeding one year. About seventy-five percent (200) were from rural areas and the rest 25% (68) were from urban area. The crude death rate (CDR) of the study population was of 9.69 per 1000 under 5 children (Table 4). From the crude birth and death rates, the population growth rate is calculated as 2.15 percent

5.9 per 1000 population. Age specific mortality rate (ASMR) was high in the age group of 65+ years (32.6/1000) followed by the age group of 60-64 years (22/1000). The lowest age specific mortality rate was observed at the age group of 10-14 years (1.5/1000). Those who passed away before celebrating their fifth birthday accounted for 72 resulting in a mortality rate of 9.69 per 1000 under 5 children (Table 4). From the crude birth and death rates, the population growth rate is calculated as 2.15 percent

Table 4: Age specific mortality rates per 1000 total population at Dabat district in northwest Ethiopia, 2008

Age	Number population			Number of death			Age specific death rate (per 1000)		
	Rural	Urban	**Total**	Rural	Urban	**Total**	Rural	Urban	**Total**
0-4	6,249	1,184	7,433	66	6	72	10.56	5.07	9.69
5-9	5,505	1,098	6,603	15	3	18	2.725	2.73	2.73
10-14	5,329	1,349	6,678	10	0	10	1.877	0	1.5
15-19	4,340	1,444	5,784	12	4	16	2.765	2.77	2.77
20-24	2,951	902	3,853	15	2	17	5.083	2.22	4.41
25-29	2,182	742	2,924	7	5	12	3.208	6.74	4.1
30-34	1,846	609	2,455	7	8	15	3.792	13.1	6.11
35-39	1,665	546	2,211	6	1	7	3.604	1.83	3.17
40-44	1,148	368	1,516	3	4	7	2.613	10.9	4.62
45-49	1,114	343	1,457	4	6	10	3.591	17.5	6.86
50-54	1,018	287	1,305	3	3	6	2.947	10.5	4.6
55-59	740	255	995	5	3	8	6.757	11.8	8.04
60-64	643	221	864	15	4	19	23.33	18.1	22
65+	1,164	398	1,562	33	18	51	28.35	45.2	32.7
Total	35,894	9,746	45,640	201	67	268	5.6	6.87	5.9

Maternal and child health
Maternal Health

In the surveyed population of 45,640, there were 1286 births of which 1250 were live, 21 abortions, and 15 still births. The general fertility rate of the population was 118.7987 per 1000 women for the age group 15-49 years. The prevalence of abortion and still birth was 1.6 % (21/1286) and 1.2 % (15/1286), respectively. Out of the total deliveries that took place in the last one year, 92.38% (1188) of the births were home deliveries while the rest 7.15 % (92) took place in health institutions. Skilled professionals attended 7.85% (101) of the births while the rest 92.15 % (1185) of births were attended by people who lack the necessary skills to assist labor and delivery.

Among the total 6,224 married women interviewed, the mean age at first marriage was 16 ±2.8 years with 25.9% of the women married at 14 years or younger, and 77.3% married before they reached 18 years of age. Among these interviewed women, 93.1% (5797) already had at least one child. Forty one percent (2377) were grand multi-para having more than four children and 1.5% (90) of mothers had ten or more children. The mean age at first birth was found to be 17.8 ±2.9 years with 7.6% of the mothers having birth at the age of 14 years or younger while 68.2% had a child before they were 18 years old.

About 61.6 % (3,652) of the married women had knowledge about antenatal care (ANC) and 51% (3,011) had ANC follow up in their last pregnancy. For those women who did not have ANC follow up the main reason was lack of knowledge 72.5% (2,112); however, 20.7% (603) of the mothers claimed they were healthy and didn't require ANC service.

About 95 % (6,100) of the married women had been vaccinated for tetanus toxoid at least once. Twenty seven percent (1776) used family planning methods at some point in their life. The most commonly used methods were Injectables 72.9 % (1298), Pills 36.5% (650), Norplant 3.2 % (52) and few women reported use of tubal legation 0.4 % (7) and intra-uterine device 0.3 % (5). About 19% of the married women were using family planning method at the time of survey. The current contraceptive prevalence rate among married women was 32.9 % in the urban areas and 14.4 % in the rural areas. The most common methods of contraception in the current users were injectables 71.2 % (881) followed by pills 21.1 % (261) and Norplant 5.2 % (64) (Table 6). For those women who were not currently on contraceptives (5190) the main reasons for not using were, using abstinence 15.5 % (804), fear of side effects 8.0% (417), and lack of knowledge 2.5% (128).

Table 5: Past and current contraceptive use in married women between 15-49 years at Dabat district in Northwest Ethiopia, 2008.

Past use			Current use		
Type	**Number**	**Percent**	**Type**	**No.**	**Percent**
Injectables	1298	64.2	Injectables	881	71.2
Pills	650	32.2	Pills	261	21.1
Norplant	56	3.0	Norplant	64	5.2
Tubal legation	7	0.3	Tubal legation	5	0.4
IUD	5	0.2	IUD	6	0.5
Condoms	3	0.1	Condoms	20	1.6
Total	2019	100	Total	1237	100

Child Health

About 99 % of the last born children in the study population had breastfeeding at some point in time. Two thousand four hundred and seventy-four (57.2%) of the women gave pre-lacteal feeds for the new born. The commonly used pre-lacteal feeds were butter 35.1%(1520), sugar solution 10%(435), and plain water 6 % (6.0) (Table 6). Three thousand six hundred and thirty-two (82 %) of the mothers gave complementary feeding to their infants. Fifty-seven percent started the complementary feeding at the age of 6-12 months (Figure 6).

Table 6: Infant feeding practices just immediately after birth at Dabat district in northwest Ethiopia, 2008.

Feeding practices	Frequency	Percent
Breast milk	1854	42.8
Butter	1520	35.1
Sugar solution	435	10.0
Water	257	6.0
Cow's milk	19	0.4
Tea	11	0.3
Others	232	5.4
Total	4328	100.0

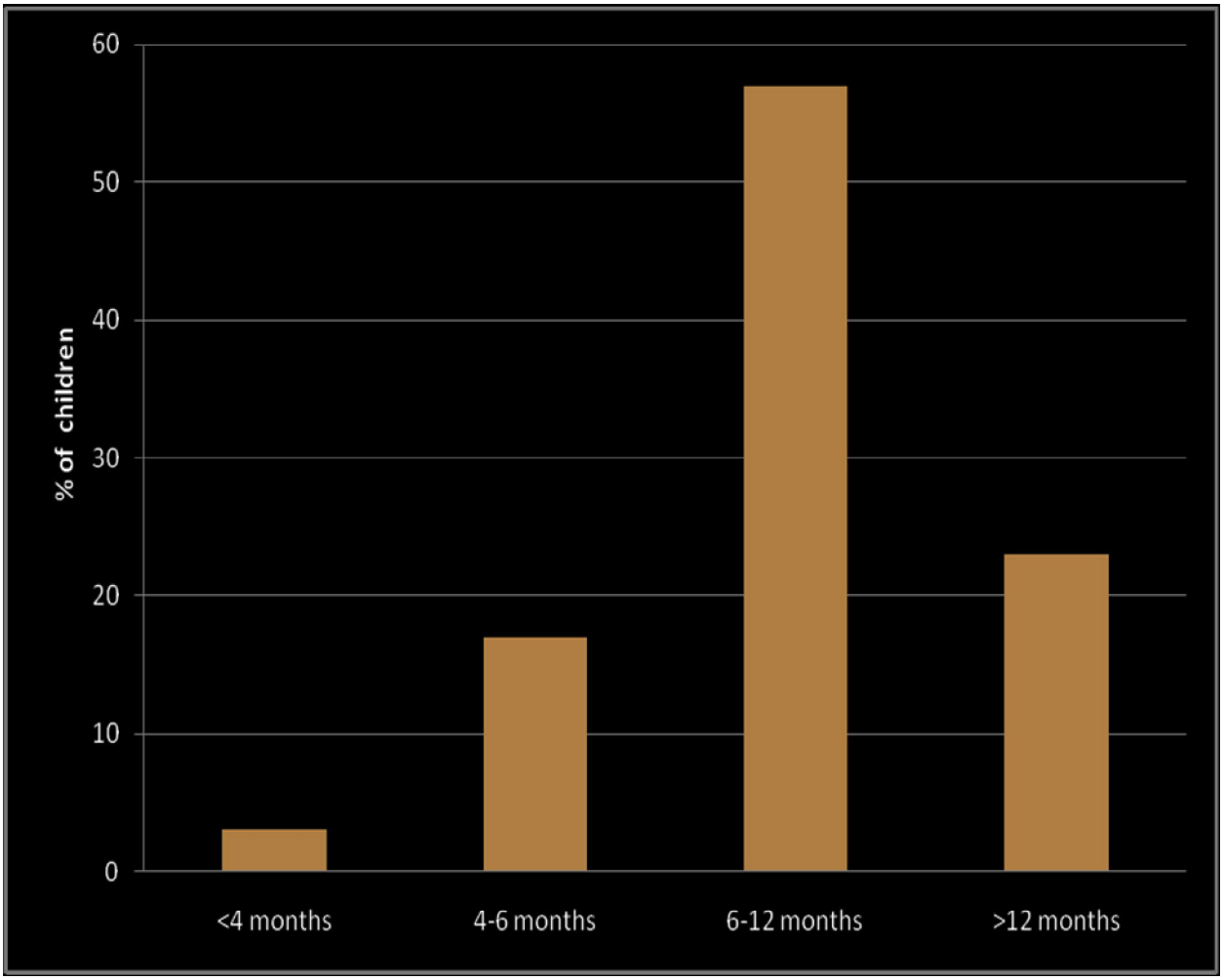

Figure 6: Complementary feeding age of last born child at Dabat district in northwest Ethiopia, 2008

The common traditional harmful practices in the children living in the study area were uvulectomy 85.5% (3571), canine milk teeth extraction 42.3 (1767), tattooing 21.5 % (899) and female genital mutilation 1.1 % (48).

Morbidities and Injuries

Out of a total of 9526 households surveyed 19.1 % (1821) reported to have at least a family member who had been sick within two weeks prior to the survey. About seventy six percent (1382) of them received some treatment in health facilities. The most commonly reported morbidities were headache (9.4%), abdominal pain/diarrhea (8.7%), and cough (6.6%) (Table 7). Out of the 45,640 people in the area, 0.58 % (221) reported at least one type of injury prior to this study. The major causes for injury were fall 1.45 % (138), car accident 0.18 % (17) and sharps 0.17(16).

Table 7: Common morbidities as reported by households at Dabat district in northwest

Morbidity (Sign/symptom)	Number	Percent*
Headache	171	9.4
Abdominal pain/diarrhea	158	8.7
Cough	120	6.6
Fever	112	6.2
Eye diseases	94	5.2
Cough, fever & headache	35	1.9
Cough & fever	24	1.3

* Percentages are calculated separately for each sign/symptom out of the total households reported morbidity (1821) in the past 2 weeks prior to data collection

Figure 7: Transportation of patient to Dabat Health Center for treatment, 2008

Environmental Health Conditions

In the study area, 40.9 % (3,881) of the rural houses were traditional tukuls made of thatched roofs; 71.6 % (6,796) of the houses did not have windows. Ninety-eight percent (9,319) of the houses had earthen floor. Ninety three percent of the rural households shared their living quarters with domestic animals compared to 7 % of the urban households.

Seventy percent (6458) of the households in the study area obtained water from unprotected sources. About ninety-nine percent of the households used jerry cans for fetching water. The median per capita water consumption per day of water for total population was 20 litters. Ninety-one percent of the households in the urban area got piped water. Only 39 % (3599) of the households had access to latrine of which 69 % (2488) had shelter. About 60 % (1533) of the urban residents owned latrines, while only 32% (2164) of the rural residents had latrines.

Figure 8: Women and young children collecting water from unprotected spring at Dabat district in northwest Ethiopia, 2008

Ninety-five percent (8,990) and 70% (6,630) of the households used wood and animal dung for cooking, respectively. Eighty nine percent of urban households used wood for cooking followed by charcoal (71.7%), animal dung (38.9%) and kerosene (1.4%) while rural households used wood (97.4%), animal dung (81.7%), and leaves (0.2%).

Ninety six percent of the rural households used to dispose their solid waste on their back yard compared to town households practicing open dumping of their waste (44%) and in pits (32.6%) (Figure 9)

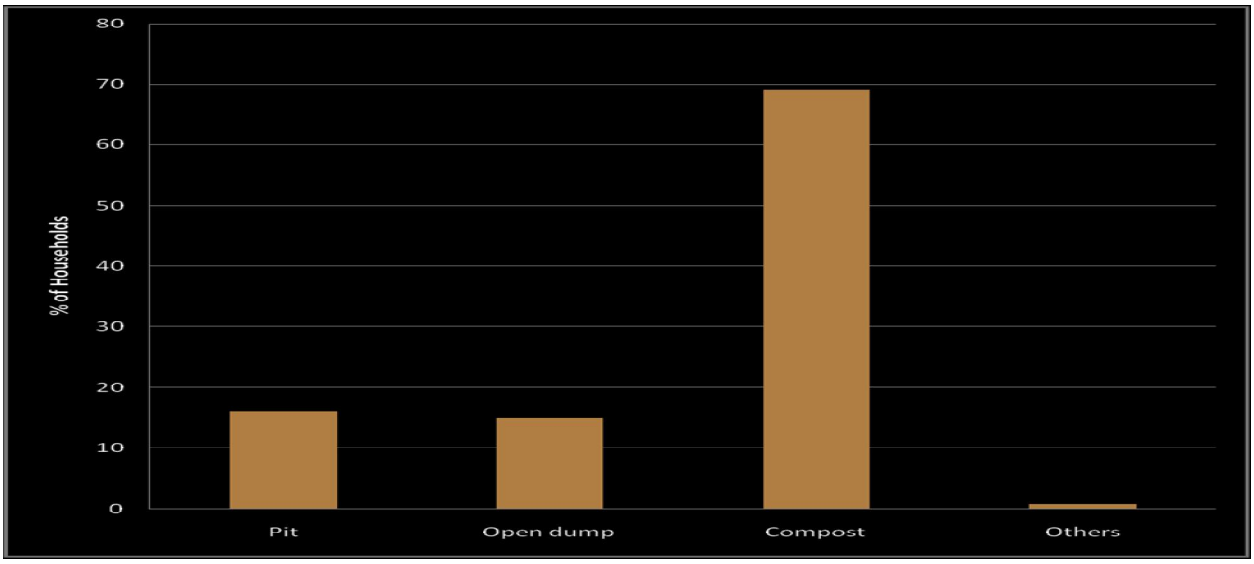

Figure 9: The distribution of waste disposal of households at Dabat district in northwest Ethiopia, 2008.

DISCUSSION

This survey revealed that the median age of residents was 21 years showing an increase compared to the 1996 report (15.3 years) [12]. Sex composition is very important for any analysis, as data on sex provides useful information about reproductive potential, human resources, level of school attendance by each sex, and so on. In this survey the male to female ratio of the study area was found to be 1:1.04. This is comparable to the report of the Central Statistics Agency of the 2007 census which reported a male to female ratio of 1:1.028 for Dabat district [1].

Age is one of the basic demographic characteristics of a population. Age data are useful for demographic analysis and for various types of socio-economic development planning. It is determined by the effects of past fertility, mortality, and migration. Though age data have many uses, it is usually very difficult to obtain reliable data on age in developing countries. This is mainly due to high illiteracy, which limits individuals' awareness and capacity to record their own as well as their children's age. Moreover, lack of a complete and sound vital registration system has a negative impact on the quality of age data. As Ethiopia is not an exception, the difficulty of obtaining reliable age information in surveys and censuses is a common challenge. In this survey, a significant proportion (45.4 %) of the study population was below the age of 15, a pattern also observed in the 2007 census (45.0%). The percentage of people 65 years and above in this survey, was found to be 3.42 which is again similar to the report of the 2007 Ethiopian census (3.2%) [1].

The total fertility rate (TFR) was 4.68 per woman which is comparable to the national figure (4.8). The fertility rate was high in the age group of 25-29, and lower in 45-49 year old women. This result is similar with EDHS 2011 finding. The crude death rate of the study population was 5.9 per 1000. The age specific mortality rate was high in 0-4 year age group and low in 10-14 year age group. Among the live births, 39 % died during the first year of life, and the under five mortality rate was 57.6 per 1000 live births which was lower than the national estimates of 2011 [2]. These differences could be attributed to the difference, in the number of study subjects involved, study context, and underreporting of neonatal, post neonatal and infant deaths by respondents in this study.

About 51 % of the married women had antenatal follow ups during their last pregnancy which was higher than the national average of 34 % [2, 6], but lower than the Sub-sahara Africa average (76 %) [13,14,15]. For those women who had no antenatal follow up in their last pregnancy, the main reasons were lack of knowledge in 72.5 %, while 20.7% of the non service users believed they didn't need ANC because they were healthy. Skilled attendance at birth was 7.85 % which was lower than the national figure (10%) [2], 20 % in Nigeria [13], 51 % in Tanzania [14], and 20 % in Kenya [15]. The current contraceptive prevalence among married women was 19% in the surveyed population which was lower than the national prevalence in 2011 which was (29%) [2]. This can be attributed to the time gap between the 2 surveys. The prevalence of early marriage (marriage before the age of 18) was 77.3% in the survey area which was very high compared to the national figure [2] and that of other developing countries [16, 17].

About 99 % of the last born children in the study population had breastfeeding at some point in time which was similar with the national practice of 98% in Ethiopian demographic and health survey [2, 6]. The majority (57.2%) of the newborn were given either butter, water or sugar solution as a prelacteal feed. This practice is generally not recommended and complementary feeding practice was also poor as 19.6 % of the infants started it before 6 months of age. Similar to the 1996 survey [12], uvulectomy was largely practiced in the study area. In the 1996 survey, female genital mutilation was not reported but in the current study 48 cases of female genital mutilation were identified.

Safe and adequate water supply and sanitation facilities are important for human health and well-being, economic production, and sustainable development. Failure to ensure the safety and adequacy of drinking water and sanitation facilities may expose the community to the risk of outbreaks of waterborne and other communicable diseases. Although drinking water is a basic human right, many people do not have access to safe and adequate drinking water or proper sanitation facilities in resource constrained settings. Only about half of the developing world's population are using improved sanitation, and addressing this inequality will have a major impact on several of the Millennium Development Goals. Disparities between rural and urban areas remain daunting, as only 40 per cent of the rural populations are covered. And while 77 per cent of the population in the richest 20 per cent of the households use improved sanitation facilities, the coverage is only 16 per cent for those in the poorest households [18, 19, 20]. In this study, only 23 % of the rural households obtained water from protected springs and wells. Ninety one percent of the households in the urban area get water from protected pipes. The Ethiopian Demography and Health Survey 2011 reported that the majority (54 %) of the households in the country had access to an improved source of drinking water with access in urban areas (95%) much higher than in rural areas (42 %). In this study setting the most common source of improved drinking water in urban areas was piped water with 91% of households having access to this source which is almost similar to the EDHS report of 2011 (87 %) [2]. Only 13 % of the rural households have access to piped water. The major source of improved drinking water in rural areas is protected spring (39%).

The present survey showed that almost all households (99%) used a biomass fuel for cooking, that is, animal dung and wood. A demographic and health survey conducted in Ethiopia in 2011 reported that wood was the most common form of cooking fuel in rural areas (77 %). In urban areas, nearly half of the households used wood for cooking (52 %), followed by kerosene 26% and charcoal 18 %.. Studies demonstrated that about 52 % the world's population and up to 90 % rural households in developing countries still rely on unprocessed biomass fuels in the form of wood, dung, and crop residues for cooking. Many of the substances in biomass smoke can lead to high levels of indoor smoke which consists of a complex mix of pollutants that could increase the risk of contracting diseases [21, 22, 23].

CONCLUSION AND RECOMMENDATIONS

The age distribution and sex composition of the study population almost matched the national figures. Infant and under-five mortally rates had significantly decreased but contraceptive prevalence rate was not satisfactory despite the deployment of health extension program in the study setting. Despite the law, early marriage was still highly prevalent in the study areas. Institutional delivery and skilled attendance was still low. The current rates of progress on environmental health services were far from the MGD target.

Based on the above findings of the survey the following recommendations are forwarded

1. The health extension program needs to be strengthened in the area so that coverage of dif ferent public health services, like contraceptive use, water supply, and sanitation etc.. will in crease.
2. There should be public education and follow up on the implementation of the law to decrease the rate of early marriage and its effects.

3. Re-census need to be conducted regularly so as to see the changes over time.
4. A variety of problem solving studies have to be conducted to fill the gaps of surveillance being undertaken by the DRC.
5. The Dabat Research Center shall consider implementing interventions in collaboration with the local administration and the community.

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