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*Full Length Research Paper*

# The economic strength of caregivers of orphans and vulnerable children in Akwa Ibom and Rivers States, Nigeria

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The true statistics of orphans and vulnerable children (OVC) in Nigeria is not well known. Therefore, a lack of empirical data on the economic conditions of OVC in Nigeria has hampered the development of effective intervention strategies to mitigate their economic needs. This study assessed the economic activities and capabilities of caregivers in enrolled vulnerable households in Akwa Ibom and Rivers States into a project being undertaken by Association for Reproductive and Family Health (ARFH) on OVC. A cross sectional survey was conducted in 8 Local Government Areas in Akwa Ibom and Rivers States. Information on demographic and socio-economic characteristics of caregivers or heads of the households were collected. Descriptive statistics, T-test and  $X^2$ - test were used for data analyses. There were 13,631 respondents/caregivers from both Local Government Areas. The commonest economic activity was petty business. The respondents did not have any prior training on other income generating activities. A sizeable proportion of caregivers saw finance as a major constraint to their business climate. The majority of caregivers of OVC in these states did not earn a living wage. Therefore, they will require vocational, business and financial literacy training for effective household economic strengthening program as an intervention strategy of any project.

**Key words:** Association for reproductive and family health (ARFH), orphans and vulnerable children (OVC), intervention strategy, business and financial literacy training.

## INTRODUCTION

The burden of orphans and vulnerable children (OVC) in Nigeria is not well known as the available information is scanty and inadequate. A situational assessment and

analysis of OVC in 2008 gave an estimate of about 17.5 million OVC in the country (Daily Trust (2011); NRSA, 2009). This suggested that for every 10 Nigerian children,

one of them is likely to be an orphan, 1/3 of whom is a maternal orphan and two-thirds are either paternal orphans or both (Daily Trust, 2011; NRSA, 2009; Save the children, 2015). In fact, the HIV/AIDS pandemic in recent years have increased the number of OVC and the poor socio-economic climate in Nigeria has resulted in the growing population of vulnerable households. The attendant hardships on the caregivers in providing basic needs for the OVC cannot be over-emphasized. These caregivers must have been experiencing difficulties on a daily basis in securing access to social basic services like education, food, portable water, protection, good hygiene and good health for their children or wards. Indeed, studies have reported that caregivers are over-burdened and not economically capable of providing for their orphans and vulnerable children (UNICEF, 2008; Nsagha et al., 2012). The consequences of the inability of caregivers to provide for their OVC are enormous. Often such a child is exposed to abuse, exploitation and social exclusion. The Rapid Assessment Analysis Action Planning (RAAAP, 2004) showed that a vulnerable child is less likely to enroll in school, more likely to drop out of school, more likely to be at higher risk of being involved in risky sexual behavior, and participate in substance abuse. Also it is well known that a likely consequence of poverty is to influence the food security status of households which can lead to an increase in the likelihood of risky sexual behavior among female children, a risk factor of HIV/AIDS (UNICEF, 2008). However, lack of reliable empirical data on the socio-economic conditions of OVC in Nigeria has hampered the development of effective policies and programs to address their specific needs. While we know that poverty is associated with orphan state, the relationship to level of poverty is not so clear. A question which sometimes come to mind is 'how poor is poor?' Some studies reported disparities or inequalities exist in economic situations of households (Awoyemi and AbdulKarim, 2009; CDC, 2011; Kochhar and Fry, 2014; Fagbamigbe et al., 2015). There is the increasing realization that poverty itself is dynamic "that some of the poor are not poor all of the time" meaning that an historical harmony has been established between poverty and vulnerability (Yaqub, 2000). So there is the need to know the economic climate of vulnerable households in Nigeria to provide a road map for developing appropriate intervention strategies for mitigating poverty of OVC caregivers. Previous studies have shown that household economic situation is positively and significantly associated with access to health care services and other basic needs of children (Ortiz, 2007; Celik and Hotchkis, 2000). Hence, any effective strategy, expected to mitigate

the impact of the burden of poverty on orphans and vulnerable children requires a household economic assessment (HEA). HEA has been defined as a framework for analyzing how people obtain food, non-food goods and services (such as access to education and health of children) and how they might respond to changes in their external environment like a drought or a rise in food prices (Holzman et al., 2008).

Thus, a Household Economic Assessment will inform the portfolio of interventions that will reduce the economic vulnerability of the OVC families and empower them to provide for the essential needs of the children they care for, rather than relying on external assistance (Economic Strengthening (2016). Besides, a good knowledge of the baseline economic situation of the vulnerable households will guide the prioritization of type of support for the caregivers of these OVC households and a platform for the future evaluation of any intervention.

Therefore, the objective of the present study is to assess the socio economic activities and capabilities of caregivers in OVC households enrolled in a LOPIN project by the Association for Reproductive and Family Health (ARFH). The study will determine their sources of household income and expenditures, household assets, coping mechanisms during periods of emergency, and potential income generating activities that can increase household livelihoods. The saying that 'if what happened yesterday is reflected in today's status and what happened today influences tomorrow's status', then the findings of the present study will inform positively the Household Economic Strengthening intervention strategy of the Association of Reproductive and Family Health (ARFH) LOPIN REGION 1 project for orphans and vulnerable children, including the kind of income generating activities that would be most beneficial for vulnerable households in Rivers and Akwa Ibom states of Nigeria to undertake.

## METHODOLOGY

This is a descriptive cross sectional survey conducted in 5 Local Government Areas (LGAs) in Akwa Ibom state and 3 others in Rivers state. The LGAs in Akwa Ibom states are: Ikot Ekpene, Okobo, Oron, Uruan and Uyo while those in Rivers State are: Port Harcourt, Eleme, and Obio/Akpor. The LGAs were purposely selected because they constitute the PEPFAR/USAID priority LGAs with high prevalence of HIV and OVC burden (PEPFAR, 2012). There were 5,254 and 8,377 vulnerable households already selected for intervention in Rivers State and Akwa Ibom State, respectively. The National Vulnerable Assessment Questionnaire was used to identify the vulnerable households (Federal Ministry of Women Affairs and Social Development, Nigeria, 2009; Bamgboye et al., 2017). The household economic assessment, was carried out between May and July 2016 by the Association of Reproductive

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**Table 1.** Sex distributions of OVC caregivers in vulnerable households in Akwa-Ibom and Rivers States by age and level of education.

Age (years)	Akwa-Ibom State			Rivers State		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
15-24	97 (2.6)	380 (8.2)	477 (5.7)	26 (2.2)	305 (7.5)	331 (6.3)
25-34	906 (24.1)	1543 (33.5)	2449 (29.3)	296 (24.8)	1718 (42.3)	2014 (38.3)
35-44	1414 (37.6)	1371 (29.7)	2785 (33.3)	474 (39.7)	1348 (33.2)	1822 (34.7)
45-54	809 (21.5)	825 (17.9)	1634 (19.5)	265 (22.2)	471 (11.6)	736 (14.0)
55-64	335 (8.9)	335 (7.3)	670 (8.0)	89 (7.4)	154 (3.8)	243 (4.6)
65-74	141 (3.7)	116 (2.5)	257 (3.1)	34 (2.8)	56 (1.4)	90 (1.7)
75 and above	59 (1.6)	41 (0.9)	100 (1.2)	11 (0.9)	5 (0.1)	16 (0.3)
<b>Level of education</b>						
No education	674 (18.0)	855 (18.6)	1529 (18.3)	34 (2.9)	267 (6.6)	301 (5.7)
Primary education	1561 (41.6)	2172 (47.2)	3733 (44.7)	423 (35.5)	1424 (35.2)	1847 (35.3)
Secondary education	1384 (36.9)	1463 (31.8)	2847 (34.1)	650 (54.5)	2236 (55.3)	2886 (55.1)
Tertiary education	134 (3.6)	116 (2.5)	250 (3.0)	85 (7.1)	118 (2.9)	203 (3.9)

and Family Health (ARFH), a local non-governmental organization located in Ibadan, South West Nigeria.

#### Data collection

A structured- questionnaire adapted from MEASURE Evaluation OVC tool kit was used to obtain information by personal interview on the demographic characteristics of the caregivers of the identified vulnerable households, their household socio economic characteristics, including household income, saving and loans practice as well as being able to access and obtain membership of a savings groups (MEASURE Evaluation, 2014). There was also an enquiry about their income generating activities and interests of the OVC caregivers. These caregivers were also asked about the constraints or obstacles to doing business as well as their general perceptions of their economic situations. Ethical consideration was through an informed consent obtained from each respondent.

#### Data analysis

Descriptive statistics such as means, medians and standard deviations were used to summarize quantitative variables while categorical variables were summarized with proportions and percentages. The wealth index was calculated using standard methods as described in previous publications (Fagbamigbe et al., 2015). The Student-T-test and  $X^2$ - test were used to determine significant differences between two mean values and associations between any two categorical variables respectively. The results were presented in appropriate tables and graphs. The statistical analysis was carried out using SPSS version 21 (IBM SPSS, 2007).

## RESULTS

### Demographic characteristics of caregivers of OVC in Akwa Ibom and Rivers states

There were 13,631 households in the two states consisting of 8,377 from Akwa-Ibom state and 5,254 from Rivers state. The mean age of the caregivers in the two states was 38.7 years (SD=11.4), statistically significantly

higher in Akwa-Ibom State, 39.7 years (SD=12.0) than Rivers-state 37.0 years (SD=10.2;  $t=395.059$ ,  $p<0.001$ ). The males in Akwa-Ibom state with mean age of 42.2 years (SD=12.5) were older than their female counterpart (mean=40.5 years; SD=9.9;  $t=303.112$ ,  $p<0.001$ ). Similarly, the mean age of males in Rivers State (41.2 years; SD=10.8) was significantly higher than their female counterpart (35.7 years; SD= 9.7) ( $t=261.982$ ,  $p<0.001$ ). The sex distribution of caregivers in Akwa-Ibom State showed a higher proportion of women (55.1%) given a sex ratio of 0.81 while the caregivers from Rivers had a sex ratio of 0.29 as women constituted 77.2%. Less than 5% of the caregivers were 65 years old and above being 4.12% in Akwa-Ibom State and 2.0% in Rivers state.

The results presented in Table 1 showed about one-fifth (18.3%) of the caregivers in Akwa- Ibom State had no formal education with a similar proportion in males (18.0%) and females (18.6%). Almost half of the respondents had primary education in Akwa-Ibom state with a lower proportion in males (41.6%) than females (47.2%). A small proportion of caregivers (3.0%) from Akwa Ibom state had tertiary education. The association between education and gender was statistically significant,  $X^2=35.963$ ,  $P<0.001$ . The situation was slightly different in Rivers state where only about 6% had no formal education and about half (55.1%) had secondary education with similar proportions in males (54.5%) and females (55.3%). About 4% had tertiary education, slightly higher than what was observed in Akwa Ibom State. Also, gender was statistically significantly associated with education ( $X^2= 24.403$ ,  $P<0.001$ ).

### Socio economic conditions of the OVC in Akwa-Ibom and Rivers States

Table 2 showed that 80% of the children in Akwa-Ibom



**Table 2.** The socio economic conditions of OVC in Akwa-Ibom and Rivers States, 2016.

Children possession	Akwa-Ibom State			Rivers State		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
<b>Had at least 2 sets of clothes</b>						
Yes	2901 (77.2)	3753 (81.3)	6654 (79.5)	1021 (90.6)	3481 (92.6)	4502 (92.2)
No	859 (22.8)	862 (18.7)	1721 (20.5)	106 (9.4)	277 (7.4)	383 (7.8)
<b>Had at least one pair of shoes</b>						
Yes	2567 (68.3)	3077 (66.7)	5644 (67.4)	863 (72.5)	3369 (83.0)	4232 (80.6)
No	1193 (31.7)	1538 (33.3)	2731 (32.6)	328 (27.5)	688 (17.0)	1016 (19.4)
<b>Had a blanket sheet</b>						
Yes	822 (21.9)	1023 (22.4)	1845 (22.2)	375 (33.7)	1064 (28.6)	1439 (29.8)
No	2924 (78.1)	3552 (77.6)	6476 (77.8)	738 (66.3)	2653 (71.4)	3391 (70.2)

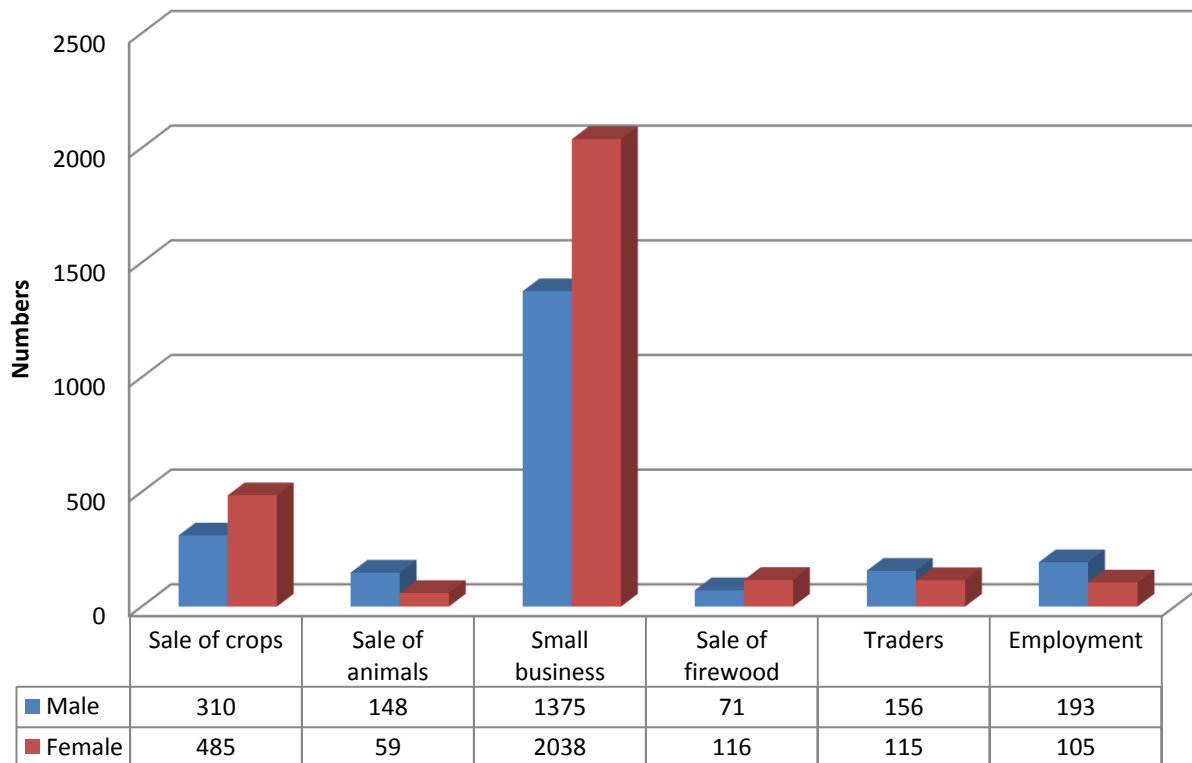
**Table 3.** The socio economic conditions of OVC caregivers' vulnerable households in Akwa-Ibom and Rivers States, 2016.

Socio economic condition	Akwa-Ibom State			Rivers State		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
<b>Wealth index</b>						
Poorest	707 (18.8)	765 (16.6)	1472 (17.6)	456 (38.2)	796 (19.6)	1252 (23.8)
Poorer	957 (25.3)	1008 (21.9)	1959 (23.4)	173 (14.5)	590 (14.5)	763 (14.5)
Middle	860 (22.9)	1085 (23.5)	1945 (23.2)	192 (16.1)	596 (14.7)	788 (15.0)
Richer	750 (20.0)	1000 (21.7)	1750 (20.9)	153 (12.8)	800 (19.7)	953 (18.2)
Richest	489 (13.0)	754 (16.3)	1243 (14.9)	219 (18.4)	1275 (31.4)	1494 (28.5)
<b>Total income</b>						
<N5,000.00	1969 (53.0)	2873 (63.0)	4842 (58.5)	341 (28.8)	1819 (45.0)	2160 (41.3)
N5,000.00-N9,999.00	1133 (30.5)	1221 (26.8)	2354 (28.5)	479 (40.4)	1367 (33.8)	1846 (35.3)
N10,000.00-N18,000.00	497 (13.4)	357 (7.8)	854 (10.3)	209 (17.6)	529 (13.1)	738 (14.1)
N18,001.00-N25,000.00	73 (2.0)	69 (1.5)	142 (1.7)	95 (8.1)	181 (4.5)	276 (5.3)
>N25,000.00	41 (1.1)	37 (0.8)	78 (0.9)	61 (5.1)	145 (3.6)	206 (3.9)
<b>Total expenditure</b>						
<N5,000.00	2047 (55.0)	2858 (62.7)	4905 (59.3)	293 (24.9)	1352 (33.6)	1645 (31.6)
N5,000.00-N9,999.00	1320 (35.5)	1380 (30.3)	2700 (32.6)	609 (51.7)	1837 (45.6)	2446 (47.0)
N10,000.00-N18,000.00	298 (8.0)	260 (5.7)	558 (6.7)	149 (12.6)	420 (10.4)	569 (10.9)
N18,001.00-N25,000.00	27 (0.7)	30 (0.7)	57 (0.7)	72 (6.1)	292 (7.3)	364 (7.0)
>N25,000.00	29 (0.8)	27 (0.6)	56 (0.7)	55 (4.7)	125 (3.1)	180 (3.5)
<b>Participation in savings schemes</b>						
Yes	540 (14.4)	936 (20.3)	1476 (17.6)	354 (29.7)	974 (24.0)	1328 (25.3)
No	3214 (85.6)	3676 (79.7)	6890 (82.4)	837 (70.3)	3083 (76.0)	392

state had at least two sets of clothes slightly lower in males (77.2%) than females (81.3%). And about two-thirds (67.4%) of them had at least one pair of shoes, with no difference between the sexes [males (68.3%) and females (66.7%)]. Less than a-quarter of the children (22.2%) had a blanket or covering sheet with similar proportions in males (21.9%) and females (22.4%).

In Rivers State, almost all the children (92.2%) had at least two sets of clothes (males: 90.6%; females: 92.6%). About 73% of them possessed at least one pair of shoes with lower proportions among males (males: 72.5%; females: 83.0%) and about 30% of them had a blanket or covering sheet (males: 33.7%; females: 28.6%).

In Akwa-Ibom State, Table 3 showed that more than



**Figure 1.** Sex differentials in the type of business of OVC caregivers in vulnerable households in Akwa-Ibom State.

one-fifth (23.4%) of the caregivers were in the poorer wealth category and a similar proportion (23.5%) in the middle wealth category; also similar in males (22.9%) and females (23.5%). The lowest proportion of the respondents (14.9%) was in the richest category lower in males (13.0%) than females (16.3%). Also, in Rivers State, the lowest proportion of the respondents (14.5%) was in the poorer category while 29% was in the richest category with much lower proportion among males (18.4%) than females (31.4%).

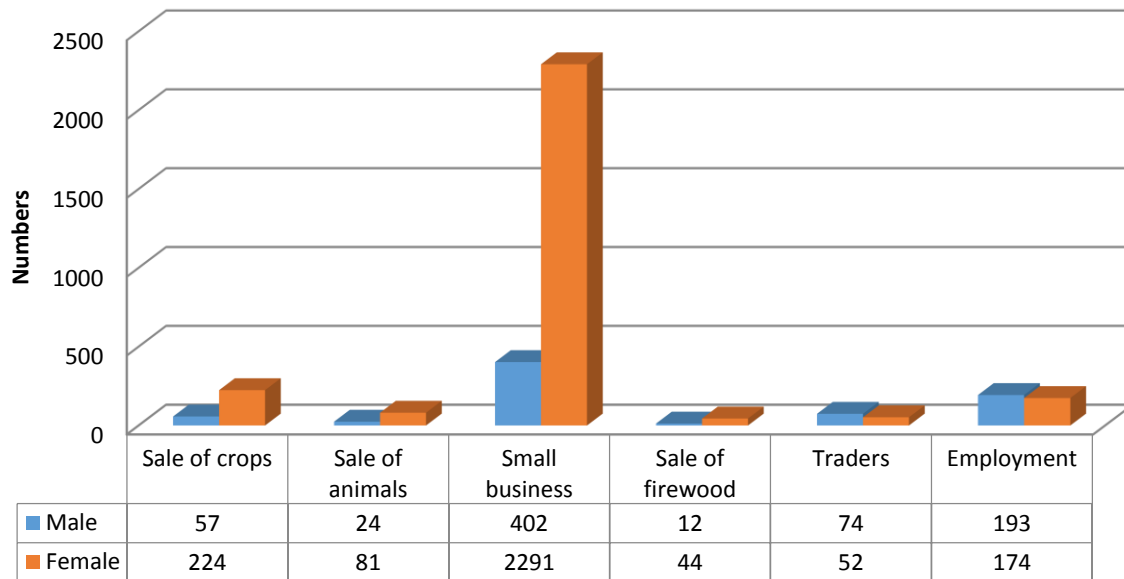
In Akwa-Ibom State, nearly 60.0% of the respondents earned less than ₦5000 monthly, slightly higher in males (63.0%) than females (53.0%). Also, about 31% of the respondents earned ₦5000-₦9999 lower in males (26.8%) than females (28.5%). However, a few people (1.1%) earned above ₦25000 (0.8% males and 1.1% females). In Rivers state, 41% of the respondents earned less than ₦5000 (28.8% of males and 45.0% of females). Also, just a little above one-third of the respondents (35.3%) earned between ₦5000 to 9999 (40.4% males; 33.8% females). And less than 5% earned above ₦25000 (3.6% males; 3.9% females).

The spending pattern of Caregivers in Akwa-Ibom state showed about 60% (59.3%) spent less than ₦5000 a month (males: 55.0%; females: 62.7%). Another one-third spent between ₦5000 and ₦9999 (35.5% males; 30.3% females), and very few (0.7%) spent above ₦18001. In Rivers State, almost one-third of the

respondents (31.6%) spent less than ₦5000 (24.9% males; 33.6% females), again, the highest proportion of the respondents (47%) spent between ₦5000-₦9999 (males: 51.7% males and 45.6% females). The proportion of respondents that spent above N25,000 was only 3.5% (4.7% males and 3.1% females). Less than one-fifth of the respondents (17.6%) participated in savings (14.4% males; 20.3% females) in Akwa-Ibom state, the proportion was higher in Rivers state with approximately one-quarter of the respondents (25.3%) having participated in savings scheme (29.7% males and 24.0% females).

#### **Sex differentials in business climate of OVC caregivers in Akwa-Ibom and Rivers States**

Figure 1 showed that in Akwa-Ibom State, about two-thirds of the caregivers (66.0%) engaged in small business and the proportion was higher among female respondents (69.8%) than their male (61.0%) counterparts. Only a few caregivers (5.8%) were in paid employment higher among males (8.6%) than females (3.6%). Also, about three-quarters of the respondents in Rivers State (74.2%) were engaged in small business (52.8% males and 79.9% females). The results illustrated in Figure 2 indicated that about one-tenth of the respondents (10.1%) were in paid employment, higher among males (23.5%) than females (6.1%).



**Figure 2.** Sex differentials in the type of business of OVC caregivers in vulnerable households in Rivers State.

### Constraints for doing business by sex

In Akwa-Ibom State, a low demand for their products is one of the major constraints for doing business reported by 18.1% of respondents with similar proportions in both sexes. And about 11.0% reported that poor market outlet constrained them from doing business similar in both sexes (10.5% males, 11.3% females). However, the major constraint to doing business expressed by a very sizeable proportion of the respondents (88.8%) irrespective of sex was finance [female (89.1%) and male (88.4%)]. Less than 5% attributed heavy taxation, HIV stigma, and poor skill as constraints to embarking on business in Akwa Ibom State.

The situation was similar in Rivers state where 13.9% of the caregivers indicated low demand for products as constraint to business similar in males (15.5%) and females (13.4%). Less than 5% mentioned poor access to market (3.0%) as constraints to business lower to what was reported in Akwa-Ibom state. These results presented in Table 4 also revealed that the major constraint to doing business was lack of finance mentioned by more than three-quarters of the respondents (76.4%) and this was higher in females (81.8%) than males (57.1%). Less than 5% mentioned stigma issues, taxation, and poor skill as other constraints to business in this state. There were no sex differentials in these constraints.

Table 5 showed almost 60% of the respondents from Akwa-Ibom state would like to embark on petty trading if given an opportunity to make a choice and this was lower in males (51.6%) than females (66.3%). However, a fifth of the males in Akwa Ibom would love to engage in livestock compared with only 5% of the females if there is opportunity in future.

In Rivers State, 52.1% (males: 53%; females: 51.9%) of the respondents would like to be petty traders in the future. However, about 10% of the caregivers would love to learn tailoring and this was similar in both sexes.

### Rural/urban differences in business climate of OVC caregivers in Akwa-Ibom and Rivers States

The study showed that slightly less than two-thirds of the respondents (63.2%) living in the rural areas of Akwa-Ibom State, engaged in small business compared to almost three-quarters of the respondents (73.8%) living in the urban areas. A higher proportion of respondents in rural areas (19%) engaged in the sale of crops compared to only 6% of respondents residing in the urban areas. However a higher proportion of urban dwellers were in paid employment (10%) compared to those in rural (4.2%) areas as presented in Figure 3.

Figure 4 shows the rural urban differentials in the type of business undertaken by the caregivers or respondents in Rivers State. About half of respondents living in the rural areas (49.2%) engaged in small business compared to more than three-quarters of those living in urban areas (77.5%). Almost 40% of rural dwellers engaged in the sales of crops compared to about 4% of respondents residing in the urban areas. But, a slightly higher proportion of the respondents living in the urban areas (10.5%) were in paid employment compared to their rural counterparts (7.7%).

### Constraints for doing business by location

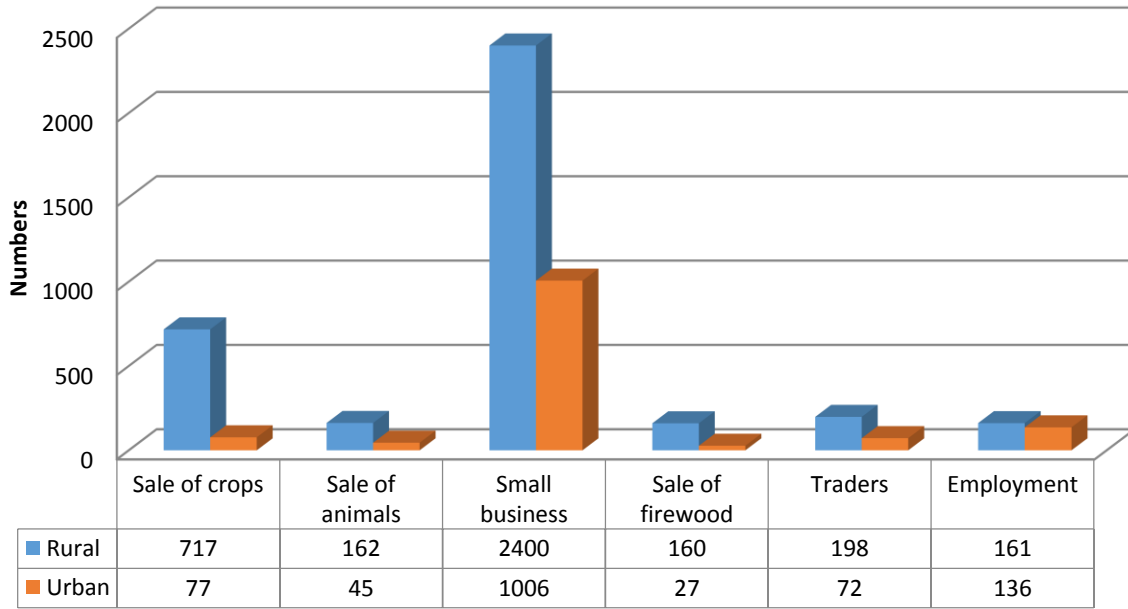
The data on business constraints of caregivers presented in Table 6 showed that about a fifth of caregivers in the

**Table 4.** Sex distribution of OVC caregivers' business constraints of in Akwa-Ibom and Rivers States, 2016.

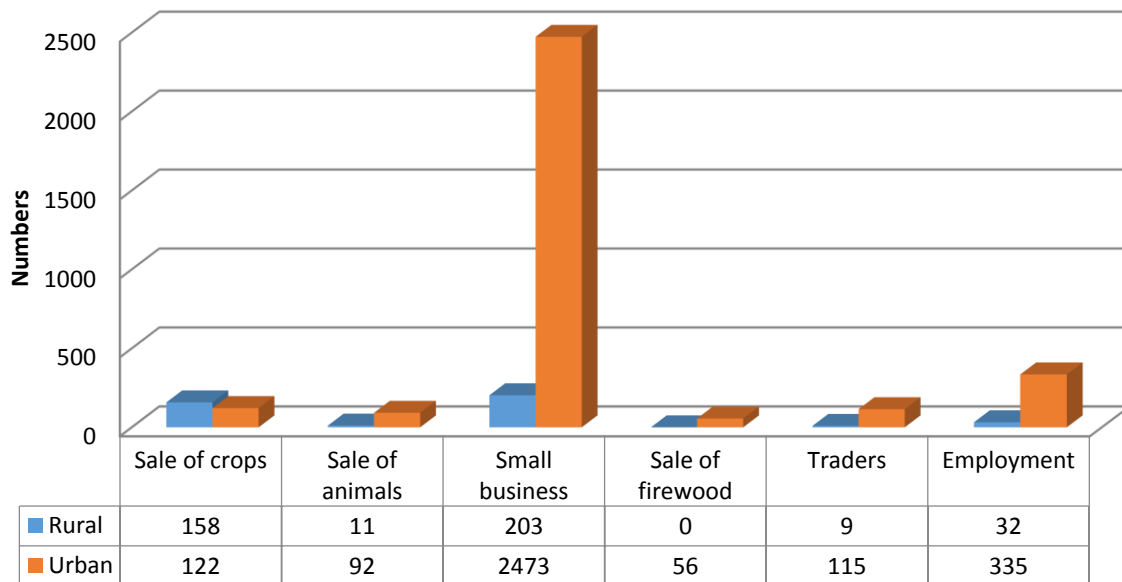
Business constraint	Akwa-Ibom State			Rivers State		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
<b>Low demand for product</b>						
Yes	2901 (77.2)	3753 (81.3)	6654 (79.5)	1021 (90.6)	3481 (92.6)	4502 (92.2)
No	859 (22.8)	862 (18.7)	1721 (20.5)	106 (9.4)	277 (7.4)	383 (7.8)
<b>Lack of access to market</b>						
Yes	2567 (68.3)	3077 (66.7)	5644 (67.4)	863 (72.5)	3369 (83.0)	4232 (80.6)
No	1193 (31.7)	1538 (33.3)	2731 (32.6)	328 (27.5)	688 (17.0)	1016 (19.4)
<b>Strong competition</b>						
Yes	822 (21.9)	1023 (22.4)	1845 (22.2)	375 (33.7)	1064 (28.6)	1439 (29.8)
No	2924 (78.1)	3552 (77.6)	6476 (77.8)	738 (66.3)	2653 (71.4)	3391 (70.2)
<b>Stigma issues</b>						
Yes	8	14	22	11	49	60
No	2453	3410	5593	881	3165	4046
<b>Lack of skills</b>						
Yes	125	153	278	44	131	175
No	2336	3001	5337	848	3083	3931
<b>Lack of finance</b>						
Yes	2175		4985	509	2629	3138
No	285	344	629	383	585	968
<b>Government interference</b>						
Yes	65	56	121	23	43	66
No	2396	3097	5493	869	3171	4040
<b>Taxation</b>						
Yes	71	105	176	27	20	47
No	2390	3048	5438	865	3194	4059
<b>Corruption</b>						
Yes	23	39	62	2	8	10
No	24238	3114	5552	890	3206	4096

**Table 5.** The business interests of OVC caregivers in Akwa Ibom and Rivers States by sex, 2016.

Business interest	Akwa-Ibom State			Rivers State		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
Hair dressing	56 (1.5)	362 (7.8)	418 (5.0)	83 (6.9)	336 (8.3)	419 (8.0)
Livestock	794 (21.1)	245(5.3)	1039 (12.4)	86 (7.2)	63 (1.6)	149 (2.8)
Soap making	86 (2.3)	199 (4.3)	285 (3.4)	30 (2.5)	87 (2.1)	117 (2.2)
Tie and dye	15 (0.4)	5 (0.1)	20 (0.2)	2 (0.2)	9 (0.2)	11 (0.2)
Confectionaries/pastries	37 (1.0)	92 (2.0)	129 (1.5)	63 (5.3)	251 (6.2)	314 (6.0)
Petty trading	1940 (51.6)	3060 (66.3)	5000 (59.7)	633 (53.0)	2103 (51.9)	2736 (52.1)
Tailoring	221 (5.9)	375 (8.1)	596 (7.1)	80 (6.7)	409 (10.1)	489 (9.3)
Others	611 (16.2)	276 (6.0)	887 (10.6)	218 (18.2)	797 (19.7)	1015 (19.3)



**Figure 3.** Rural/urban differences in the type of business of OVC caregivers in vulnerable households in Akwa-Ibom State.



**Figure 4.** Rural/urban differences in the type of business of OVC caregivers in vulnerable households in Rivers State.

rural areas (21.4%) of Akwa-Ibom State, indicated low demand for their products as a constraint compared with less than 10% (9.2%) among those living in urban respondents. A very small proportion of the urban respondents (2.6%) were constrained to doing business due to lack of access to market compared to their rural counterparts (14.2%). About 87% of the rural respondents reported financial constraints to doing

business while this was reported by higher proportion among urban dwellers (92.8%). A small proportion mentioned taxation as constraints among both rural (2.8%) and urban respondents (4.0%).

In this study, the major constraint of most caregivers to doing business in Rivers State was finance as reported by about two-thirds of the respondents (66.1%) living in the rural areas and more than three-quarters of

**Table 6.** The business constraints of OVC caregivers in Akwa Ibom and Rivers States by rural and urban location, 2016.

Business constraint	Akwa-Ibom State			Rivers State		
	Rural (%)	Urban (%)	Total (%)	Rural (%)	Urban (%)	Total (%)
<b>Low demand for product</b>						
Yes	873 (21.4)	141 (9.2)	1014 (18.1)	94 (17.8)	475 (13.4)	569 (13.9)
No	3202 (78.6)	1391 (90.8)	4593 (81.9)	435 (82.2)	3077 (86.6)	3512 (86.1)
<b>Lack of access to market</b>						
Yes	577 (14.2)	40 (2.6)	617 (11.0)	11 (2.1)	111 (3.1)	122 (3.0)
No	3498 (85.8)	1492 (97.4)	4990 (89.0)	517 (97.9)	3441 (96.9)	3958 (97.0)
<b>Strong competition</b>						
Yes	796 (19.5)	115 (7.5)	911 (16.3)	6 (1.1)	305 (8.6)	311 (7.6)
No	3277 (80.5)	1417 (92.5)	4694 (83.7)	522 (98.9)	3247 (91.4)	3769 (92.4)
<b>Stigma issues</b>						
Yes	22 (0.5)	0 (0.0)	22 (0.4)	0 (0.0)	60 (1.7)	60 (1.5)
No	4051 (99.5)	1532 (100.0)	5593 (99.6)	528 (100.0)	3492 (98.3)	4020 (98.5)
<b>Lack of skills</b>						
Yes	244 (6.0)	34 (2.2)	278 (5.0)	2 (0.4)	169 (4.8)	171 (4.2)
No	3829 (94.0)	1498 (97.8)	5337 (95.0)	526 (99.6)	3383 (95.2)	3909 (95.8)
<b>Lack of finance</b>						
Yes	3555 (87.3)	1421(92.8)	4976 (88.8)	349 (66.1)	2775 (78.1)	3124 (76.6)
No	517 (12.7)	111 (7.2)	628 (11.2)	17 (33.9)	777 (21.9)	956 (23.4)
<b>Government interference</b>						
Yes	72 (1.8)	49 (3.2)	121 (2.2)	7 (1.3)	58 (1.6)	65 (1.6)
No	4001 (98.2)	1482 (96.8)	5493 (97.8)	521 (98.7)	3494 (98.4)	4015 (98.4)
<b>Taxation</b>						
Yes	155 (2.8)	61 (4.0)	176 (3.1)	2 (0.4)	45 (1.3)	47 (0.2)
No	3958 (97.2)	1470 (96.0)	5428 (96.9)	526 (99.6)	3507 (98.7)	4033 (98.8)
<b>Corruption</b>						
Yes	50 (1.2)	12 (0.8)	62 (1.1)	1 (0.2)	9 (0.3)	10 (0.2)
No	4023 (98.8)	1519 (99.2)	5542 (98.9)	527 (99.8)	3543 (99.7)	4070 (99.8)

respondents (78.1%) in the urban areas. The least mentioned constraint was taxation indicated by only 0.4 and 1.3% of rural and urban dwellers respectively. Also, about 18% of respondents living in rural areas expressed that their major constraint to successful business was low demand for their products compared with 14% of urban respondents. A few residents in both urban (3.1%) and rural (2.1%) areas indicated lack of access to market as constraints to successful business.

### Preferred business

The data presented in Table 7 showed that in Akwa-Ibom

State, almost 60% of the respondents residing in the rural areas would want to be petty traders, a business mentioned by a slightly higher proportion of urban residents (62.9%). Livestock business was preferred by 12% of respondents from Akwa Ibom state and this was slightly higher among rural dwellers (13%). About 5% of respondents would want to be hairdressers, similar in both rural and urban areas. Unfortunately, the other business indicated by a seemingly sizeable number of respondents (11.4%) living in the rural areas and 8.0% of the respondents living in the urban areas were not specified.

Also, in Rivers state, more than two-thirds of the living in the rural areas and 20.2% of those in the urban

**Table 7.** The preferred business of OVC caregivers in Akwa Ibom and Rivers states by rural/urban location, 2016.

Preferred business	Akwa-Ibom State			Rivers State		
	Rural (%)	Urban (%)	Total (%)	Rural (%)	Urban (%)	Total (%)
Hair dressing	304 (4.8)	111 (5.7)	415 (5.0)	32 (4.6)	383 (8.5)	415 (8.0)
Livestock	836 (13.1)	203 (10.3)	1039 (12.4)	25 (3.6)	124 (2.7)	149 (2.9)
Soap making	244 (3.8)	41 (2.1)	285 (3.4)	4 (0.6)	112 (2.5)	116 (2.2)
Tie and dye	17 (0.3)	3 (0.2)	20 (0.2)	0 (0.0)	11 (0.2)	11 (0.2)
Confectionaries/pastries	103 (1.6)	26 (1.3)	129 (1.5)	8 (1.1)	302 (6.7)	310 (5.9)
Petty trading	3758 (58.7)	1235 (62.9)	4993 (59.7)	473 (67.6)	2249 (49.8)	2722 (52.2)
Tailoring	407 (6.4)	188 (9.6)	595 (7.1)	60 (8.6)	419 (9.3)	479 (9.2)
Others	729 (11.4)	157 (8.0)	886 (10.6)	98 (14.0)	914 (20.2)	1012 (19.4)

areas did not specify any kind of business.

## DISCUSSION

The findings in this study showed that the average age of caregivers or household heads which was higher in Akwa Ibom than their counterparts from Rivers State is similar to the report of the 2013 NDHS which showed slight regional variations across states in South- South region with respect to age of household heads (NDHS, 2013). A plausible explanation could be the movement of youths to the coastal areas occupied by Rivers State leaving their families with their parents who are older in the hinterland.

Another important finding in this study is the differential sex ratio between Akwa Ibom and Rivers State which showed more female caregivers or head of households in Rivers State than in Akwa Ibom. The plausible explanation for this could be the constant migration of younger ones from the hinterland to the coastal area where there is a better economy and increasing urbanization. The females in the rural areas are more exposed to unprotected casual sex and in most cases the men who impregnated these girls or married them either absconded or died from the risky behaviors they engage in the quest to making money because of the increasing rise in the prices of goods and services that characterize urban cities they ran to. This leads to many families being headed by females in the rural areas and the higher ages of males than females as the young males have migrated to urban areas for greener pastures.

The fact that a high proportion of caregivers or household heads with formal education was higher in Rivers State than Akwa Ibom also corroborates the recent NDHS finding which shows that the proportion of women who completed secondary education in Rivers State was higher than in Akwa-Ibom and indeed any other states within the South-South region (NDHS, 2013). This is not to be surprising if we one recognizes that Port Harcourt, capital of Rivers State was one of the coastal cities that had early contact with the missionary people, a phenomenon associated with early exposure to western

education and rapid urbanization (NDHS, 2013). Also, since majority of the caregivers in Rivers State were females, their access to formal education in Rivers State also explains the high disparity with caregivers from Akwa Ibom State. Again the literacy level of the two states which was better in Rivers State than in Akwa-Ibom State is in line with findings of a study which revealed that poverty and vulnerability to poverty are highest among household headed by persons with low education (Md. Shafiul and Katsushi, 2009).

The present economic situation of vulnerable households in Akwa-Ibom and Rivers States showed that the poverty level in the two states was high, but higher in Akwa Ibom than Rivers State. The total income from all members of households in Akwa Ibom state was poorer than those from Rivers State. It is not surprising that a higher proportion of respondents from Rivers State were in the richest category of wealth index scale while the reverse was observed in Akwa Ibom State whereby the highest proportion of the respondents was in the poor category of the wealth index scale. Another finding that showed a higher proportion of children in Rivers State having access to basic social needs like clothing or blanket compared with their counterparts in Akwa Ibom State corroborates an earlier study that reported higher prevalence of income poverty in Akwa-Ibom State than neighboring states (Umoh et al., 2015). The use of children possession of basic materials as an indicator of poverty level in this study is in line with the World Bank definition of poverty as any person who is deprived in any one of the dimensions: Material measured by income or consumption, low achievements in education and health, vulnerability and exposure to risk, noiselessness and powerlessness (World Bank, 2001). However, a UNICEF study defined absolute poverty as "a condition characterized by severe deprivation of basic human needs (UNICEF, 1998).

Again since Education is found to be a key element to reducing poverty, the relatively higher level of poverty in Akwa Ibom State than that observed in Rivers State can partly be explained by the higher educational level of caregivers observed in Rivers State (Ballara, 2002). The

observed higher earning capacity in Rivers State than that found in Akwa Ibom State can also be attributed to the rapid industrialization of Rivers State as a result of its location at the coastal areas where the oil business thrives. This factor can also explain the higher proportion of people in paid employment in Rivers than Akwa Ibom State.

The choice of petty trading as the major business of interest in Akwa Ibom and Rivers State could be attributed to the limited knowledge of other trades than buying and selling. Again, there is the issue of ignorance that petty trading can only earn them what to eat and not for living well. This finding is similar to previous work in Nigeria that reported low household agricultural productivity and associated low income to have resulted in persistent food insecurity particularly in the rural and low income urban households (Abimbola and Kayode, 2013). The environment can also explain why a higher proportion of urban dwellers do business and the sale of crops and livestock was relatively commoner among rural dwellers. Another explanation can be that more arable land for farming may be available in the rural areas than the urban.

The finding that lack of finance is the common denominator of the constraints to carrying out profitable income generating activities is worthy of note. Every business requires adequate financing and not surprising that these vulnerable households attributed their poor economic condition to lack of finance. It is therefore suggested that the provision of financial support to the caregivers may increase their resilience to provide for their families. One other finding that showed a higher proportion of rural respondents had financial constraint than those in urban areas could be due to the exposure to a high economy of urban dwellers in the states. The lower demand of products that was found higher in rural areas could be as result of the market whereby many caregivers produce the same things within a small population contrary to the ever increasing population in the urban areas.

## Conclusion

A sizeable proportion of respondents in this study earned below the minimum wage of 18,000 naira in Nigeria and did not have or receive any education on any income generating activities. A small proportion was aware of the need to save money but could not save because most of them did not even earn enough to meet their basic household needs. Very low proportion had received any type of educational assistance or training on types of good business and its management.

There is need to improve access to education in the rural communities which is likely to increase their awareness about business that could be lucrative. Also giving them appropriate orientation would also help them to know how to source for the capital to start up any

business of choice. It is recommended that the governments in the two states should facilitate the type and quality of education in their states to include courses in entrepreneurship and small scale empowerment programs.

The household economic strengthening program of the Association for Reproductive and Family Planning (ARFH) should support the vulnerable households in the choice of business that will reduce their poverty level but should be accompanied by appropriate training in entrepreneurship and skill acquisition.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

## Tuberculosis data sampling of a district hospital in Malawi: An epidemiological perspective

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This study is a direct hands-on epidemiological sampling of a hospital data of registered patients for tuberculosis (TB) in the Kasungu District Hospital of Malawi. The data for the year 2013 and 2014 were chosen as the latest but random sample to analyze whether the data fit in and follow the broad pattern of the country at the national level and also at the global level. The data represent convoluted results of genuine TB diagnosis and latency, but impacted by the socio-cultural mindset to obtaining health care in general. Incidences of human immunodeficiency virus (HIV) run in close parallel to TB as the former precariously enhance the vulnerability from TB infection to the disease stage.

**Key words:** Tuberculosis (TB), Malawi, human immunodeficiency virus (HIV).

### INTRODUCTION

Tuberculosis (TB) is a disease caused mainly by bacteria (*Mycobacterium tuberculosis*) in majority of cases followed by other similar microbes such as *Mycobacterium bovis* (Liu et al., 2015; Chatterjee and Pramanik, 2015; Wobudeya et al., 2015). It is a disease that has rather a ubiquitous presence by affecting almost 1/3 of the world population in latent form (Castilla et al., 2009). The TB microbes infect many people before visible symptoms are

discovered when the disease is fully evident. Also, when a person develops active TB (disease), the symptoms (cough, fever, night sweats, etc.) are initially so mild that they procrastinate medical care and thus it results in transmission of the bacteria to others. A TB patient can infect up to 10 to 15 other people through close contact over the course of a year and therefore, is a ferociously contagious disease (Kehn-Hall et al., 2011). TB had the

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**Table 1.** Overview of registered patients in Kasungu District Hospital, Malawi in 2014.

Age (Year)	Male			Female		
	Total	Died	Relapse	Total	Died	Relapse
<5	5	0	0	1	0	0
>5	234	16	18	164	9	7

dubious distinction of being the largest single cause of death in industrialized countries in the mid-nineteenth century (Wobudeya et al., 2015). However, the TB mortality declined dramatically because of efficient disease management including treatment by chemotherapy and improving social circumstances. In a significant way, the World Health Organization (WHO) has taken multipronged approaches of the disease prevention and management so that post 2015, in the following twenty years, the world will be free of TB (Global Tuberculosis Report, 2015; Yoko et al., 2015).

Like many diseases, TB is an opportunistic disease and socio-economic factors play pre-eminent roles in deciding the national statistics with regard to this disease (John et al., 2007). The sub-Saharan African nations make interesting case studies for building a perspective in terms of occurrences of TB and the management of the disease.

The current study comprises of a direct look at the Hospital registration data of reported cases of TB in Kasungu District Hospital of Malawi. The access to the data was provided to the researchers of STEM Research Institute, Fairfax, VA, USA, who, along with the hospital authorities, undertook an analysis of one year of reported cases.

Thus, the cases have been organized on the basis of gender, age and time of the year as well as the patients' human immunodeficiency virus (HIV) status. The focus year is 2014, though some data of 2013 are included when comparison was warranted. The years were chosen simply to have the latest data at the time of the study.

## METHODOLOGY

Data were obtained directly from the registers of the Kasungu District Hospital of Malawi. Hospital records included every TB case and admitted patient, type of TB, category of TB, and treatment outcome. Death could be due to any cause during anti-tuberculosis treatment. For patients that died during their stay at the hospital, the age, sex, and day of death were recorded.

Patients that tested smear positive were treated for six months at the hospital and would be identified as cured if they tested smear negative after the entire duration of the treatment period. Relapse was defined as completing the six-month treatment for the previous TB, contracting TB again, and testing smear positive. No treatment

outcome was a result of no information being available.

## RESULTS

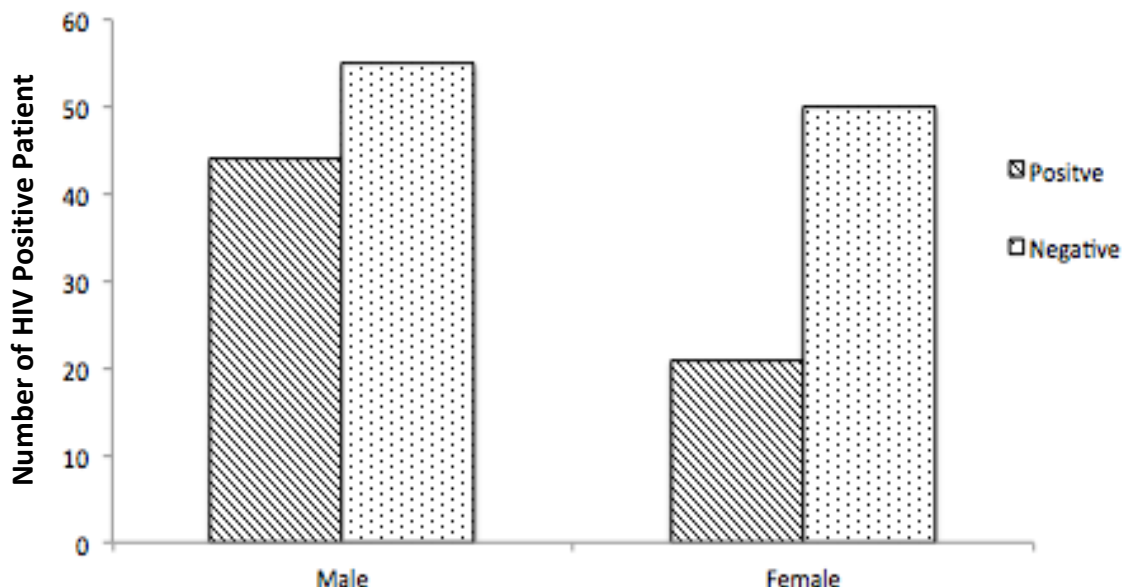
In the year 2014, there were 234 male and 164 female patients over the age of 5 and only 5 male and 1 female minor with age  $\leq 5$  years, as listed in Table 1. Of the patients over 5 years, 5 males died of the disease.

It is a common phenomenon to see co-affliction of TB and HIV because the HIV positive status increases the vulnerability of a person to TB infection. Figure 1 shows the HIV status of the TB patients. There were 45 HIV positive vs. 56 HIV negative in males, while 21 and 50, respectively among females. These figures translate to 18.8% of the total male patients testing HIV positive vs. 23.4% male patients testing HIV negative in 2014 and 12.7% female patients testing HIV positive vs. 30.3% female patients testing HIV negative. Figure 2 shows the total numbers of TB patients as they vary from month to month. It may be noted that except for larger number of patients in April and November and concomitantly more HIV positive cases, the number of patients average between 13 and 14 per month with roughly 40% of them detected HIV positive among both males and females.

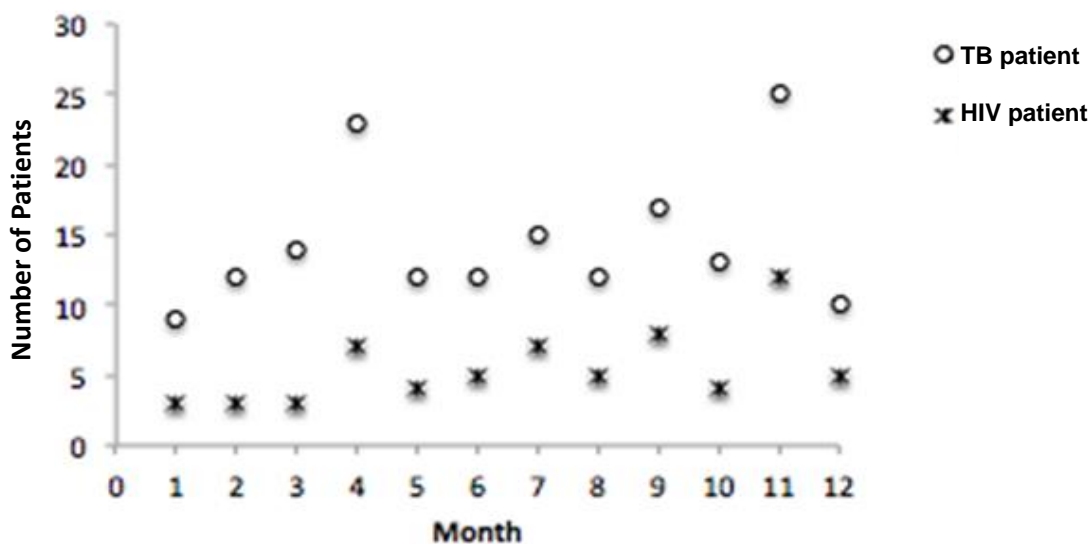
It is apparent that there was a decrease in the total number of TB cases in the year 2014 compared to the previous year (Figure 3). In order to comment on whether there is a general trend of the year-to-year decrease on the total number of cases, multi-year data analysis is necessary, which is beyond the scope of this short study. However, the decrease of total number of TB patients is an encouraging sign. Figure 4 shows month-to-month variations in both 2014 and 2013 of the total TB patients for either gender and irrespective of their HIV status. It appears that there is no clear tendency of a particular time of the year spiking on the number of TB patients.

## DISCUSSION

The incidence of diseases on the sub-Saharan Africa has been a subject of intense studies and analysis both from epidemiological perspective as well as from a socio-economic context (Bell et al., 2015; Peter et al., 2013;



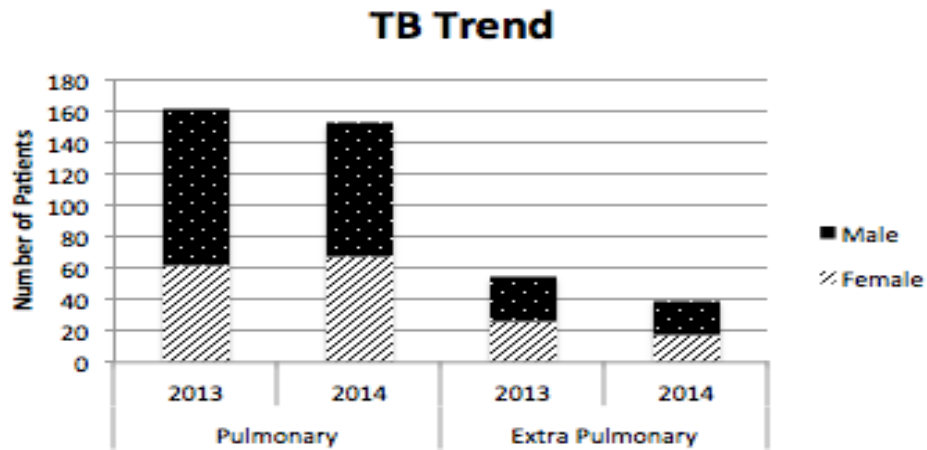
**Figure 1.** HIV status of TB patients in Kasungu District Hospital in the year 2014. HIV Positive in stripes (dark) and HIV negative in dots (light). In both male and female, there are more HIV negative than HIV positive patients.



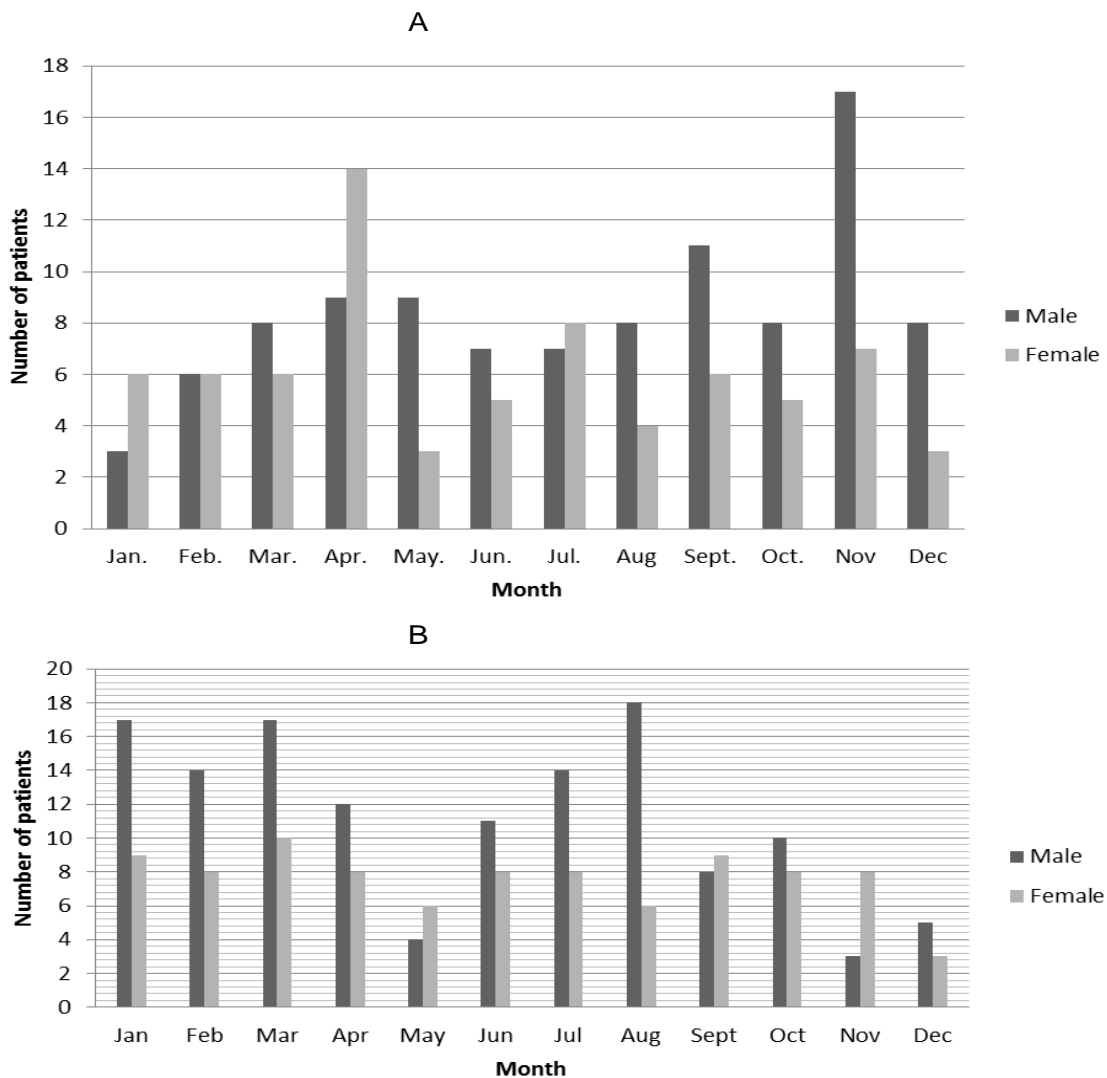
**Figure 2.** Co-relationship between HIV and TB patients. Reported number of patients has been categorized by months.

Christine et al., 2011). The burden of TB in sub-Saharan is enormous. Continuing poverty and other socio-political realities in the continent have largely inhibited progress in implementing effective TB control measures, both indigenous and internationally sponsored. Needless to mention, TB is closely related to lifestyles of poverty, overcrowded conditions, drug addiction, and malnutrition.

This disease spreads quickly among undernourished populations. But aside from this, the link between TB and the acquired immune deficiency syndrome (HIV/AIDS) is the one that exacerbates the problem most. People who are latently infected with *M. tuberculosis*, about one-third of the inhabitants of sub-Saharan Africa, are at hugely greater risk of developing active TB if they are also



**Figure 3.** 2013-2014 Male and female TB trend based on pulmonary and extra pulmonary patients. Male is indicated with dots while female is indicated in stripes.



**Figure 4.** Number of TB patients in 2014 (A) and 2013 (B) in Kasungu District Hospital, Malawi.

immunologically weakened by HIV positive status (Scheele et al., 2002).

Malawi happens to be one of the least developing countries in the world. The economy is heavily based on agriculture, with a largely rural population, low life expectancy and high infant mortality. The country faces challenges in education, health care and environmental protection. However, the country has several programs running with international aid and the outlook has been improving over the years. The scene of disease management including TB also shows some optimistic outcomes.

The hospital data from the Kasungu District Hospital in the survey year 2014 shows that there are more male patients afflicted with the disease than females, though the case mortality in case of females is higher. This is likely because there was a higher percentage of smear positive among all female TB patients compared to all male TB patients. The total number of patients has decreased from 2013. The percentage of infant patients (under 5 years) is less than 1% in both genders and the case fatality rate is nearly nil. The overall trend of the TB incidence and management seems consistent with the national trend. The data from Table 1 suggests high cure rate or at least low death rate. But it should be borne in mind that according to one study, about 40% of TB deaths in Malawi occurs in the first two months of treatment (Harries et al., 2001; Kang'ombe et al., 2004). There is also evidence that high mortality amongst patients occurs months or years after TB treatment. A TB report by Nyirenda (2006) has collected the data from 1997 and 2002. A comparison of the current hospital data with the report suggests that the trends have remained intact in that the male patients outnumber females in both HIV positive and negative patients.

Although, the reported low incidence among children is an encouraging finding, it also has to be noted that the diagnosis through regular procedure such as smear-positive tests are not very effective in children. Additionally, this study is limited to only cases that were registered and treated in the district hospital. It should also be recognized that the NTP uses passive case finding, that is, patients present to health facilities for TB diagnosis, which is the most inexpensive and easiest way of databasing. Therefore, it is understandable that because of the latency of the disease or other cultural or socio-economic constraints, these statistics could be highly underestimated.

## Conclusion

According to the WHO, the year 2015 is a watershed moment in the battle against tuberculosis (TB) since WHO set up the Millennium Development Goals (MDGs) at the start of the millennium to tackle deadly disease.

The slogan has been from Stop TB Strategy to the End TB Strategy. Both Kenya and Malawi have reported decreases in tuberculosis incidence among both HIV-infected and uninfected people (Yuen et al., 2014; Kanyerere et al., 2014). WHO established a global TB monitoring system and accordingly, 20 annual rounds of data collection have been completed. Overall, the global trend shows an immense optimism that TB can be completely eradicated in specified time frame earmarked by the organization. Thus, this study report would potentially testify, at a later time analysis of the country profile of Malawi, as being a credible component of a set of studies by various agencies.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## ACKNOWLEDGEMENTS

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## Full Length Research Paper

# Knowledge of rabies in and around Nekemte Town, Ethiopia

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Rabies is a serious fatal disease and a public health problem in Ethiopia. This study was conducted to investigate knowledge, attitudes and practices (KAP) related to rabies and its prevention and control amongst households in Nekemte town and its surroundings. A cross-sectional study design was used. A multistage sampling procedure with simple random sampling technique was employed to select households. The data were obtained from 384 households through face to face interview using pretested and structured questionnaires. Statistical Packages for Social Sciences Windows version 16.0 was used for data analysis. Findings were described using descriptive statics and Pearson's Chi square was used to show the association between outcome (KAP) and explanatory variables. Out of 384 respondents interviewed, 59.9% were males and 40.1% females, and 33.6% were between 15 and 30 years old. The majority of the respondents (47.4%) were protestant. Over 38.4% of the participants owned domestic dogs and 97.4% knew that dog bites transmit rabies. 53.1% participants had good level of KAP, making this outcome strongly associated with sex ( $\chi^2=18.06$ ,  $p<0.08$ ), age ( $\chi^2=85.4$ ,  $p<0.001$ ) and educational level ( $\chi^2=336.99$ ,  $p<0.001$ ). These findings indicate that the Nekemte community has good knowledge on rabies. But more work is required to raise the community knowledge regarding ways of infection, symptoms identifications, treatment measures as well as appropriate prevention methods.

**Key words:** Rabies, Ethiopia, clinical signs, animal bites, post exposure prophylaxis, Nekemte.

## INTRODUCTION

Rabies is an acute encephalitis illness caused by rabies virus in the genus, *Lyssavirus* and family, *Rhabdoviridae*. The virus affects almost all mammals and results in death once clinical signs are manifested (Jackson and Wunner, 2007). Worldwide, human mortality was estimated to be 55,000 deaths per year of which 56% occur in Asia and 44% in Africa. Rabies is endemic in developing countries of Africa and Asia (WHO, 1998) and about 98% of the

human rabies cases occur in the developing nations (WHO, 2004). Rabies in humans was responsible for 1.74 million disability adjusted life years (DALYs) losses each year. The annual cost of rabies in Africa and Asia was estimated at US\$ 583.5 million besides, in Africa and Asia, the annual cost of livestock losses as a result of rabies is estimated to be US\$ 12.3 Million (Knobel et al., 2005).

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Rabies is endemic in Ethiopia as well and an estimated 2,700 people die each year, which is one of the highest rates in the world (CDC, 2016). In the country, it is estimated that there is one dog per five households nationally (Deressa et al., 2010) with poor management. In Ethiopia, individuals who are exposed to rabies virus often see traditional healers for the diagnosis and treatment of the disease. These widespread traditional practices of handling rabies cases are believed to interfere with timely seeking of PEP. Rabies victims especially from rural areas seek PEP treatment after exhausting the traditional medicinal intervention and usually after a loss of life from family members (Deressa et al., 2010).

The available information on rabies in Ethiopia is largely passive (Paulos et al., 2002; Eshetu et al., 2000). Passive reports usually underestimate the incidence and are poor indicators of the status of the disease in countries where human and animal health information systems are inadequate (Kitalaa et al., 2000; Kayali et al., 2003).

There is lack of accurate quantitative information on rabies both in humans and animals. Furthermore, little is known about the awareness of the people about the disease to apply effective prevention as well as control measures in Ethiopia. Therefore, the objective of this study was to determine the level of knowledge, attitudes and practices (KAP) of the community in Nekemte town on rabies.

## METHODS

### Design of the study

This was a community based cross-sectional study, conducted from November 2015 to April 2016 in the community of Nekemte and surrounding areas. This community lives in 4 urban and 4 peri-urban Kebeles. A total of 384 people were selected from those communities live in and around Nekemte town. The human population includes both urban and peri-urban community. Community of all age groups and both sexes were asked.

### Study area

The study area is Nekemte town located in east Wallaga in Oromia region. It is located 331 km south west of Addis Ababa. This town has a latitude and longitude of 9°5'N 36°33'E with an elevation of 2088 m (6850 ft) above sea level. Based on 2007 National Census Conducted by the Central Statistical Agency of Ethiopia, this town has a total population of 8456 of which 42121 are men and 4238385 women. The climate is warm and temperate. In winter, there is much less rain fall than in summer. The average annual temperature is 21°C. The average annual rain fall is 1497 mm (CSA, 2007).

### Sampling process

The required sample size for this study was calculated using single proportion sample size determination (Thrusfield, 2005) considering

50% of population as knowledgeable to rabies at 95% confidence interval and 0.05 absolute precision. A multi-stage sampling technique was employed for the selection of the sampling units. From the entire primary sampling unit, that is, 7 administrative areas, 2 were selected by simple random sampling technique. Kebeles were selected from each administrative area by random method and the samples were distributed proportionally to sample size to each Kebele.

From the entire tertiary sampling unit, individual household, in the selected Kebeles was selected using a systematic random sampling technique. They were further selected by simple random sampling techniques and interviewed. A pretested structured questionnaire was used for this study. The data were collected via interview.

The questionnaire was first developed in English and then translated into Oromic language (native language) for appropriateness and easiness in approaching the study participants.

### Data analysis

After collection, the data was cleaned and checked for its completeness. After complete checking-up, the data was coded and entered into Microsoft Excel and transported to Statistical Packages for Social Sciences (SPSS) version 20. The frequency distribution of both dependent and independent variables were worked out by using descriptive statistics techniques and association between independent variables and KAP scores on rabies was calculated using Pearson's Chi square.

## RESULTS

### Socio-demographic characteristics

A total of 384 of the participants responded to the questionnaire yielding a response rate of 100%. Of these, 59.9% were males. 33.6% of the participants were aged between 15 and 30 years.

The majority of the respondents, 47.4% were Protestants followed by Orthodox 39.3%. Concerning educational status, 22.9% of the participants were at primary school level (Table 1).

### Knowledge of participants related to cause, ways of getting rabies, clinical signs and fatal nature of rabies

Of these respondents, 59.6% knew that virus is the cause of rabies, 97.4% were aware that dog is the most common source of rabies followed by cat 10 (2.6%) (Table 2). 39.6% of the respondents reported that hyper salivations are symptoms in rabid animals, while 18.75% mentioned that paralysis is manifested as sign. 78% of the respondents washed the wound with water and soap immediately, 35.7% seek health center, 45.8% had positive attitude for traditional healer. 90.7% of the participant identified dogs as the main animal, which transmit the disease, while 2.6% recognized the cat's role in the transmission.

**Table 1.** Socio-demographic characteristics of the study participants in Nekemte town, 2016

Characteristics	Frequency	%
<b>Sex</b>		
Male	230	59.9
Female	154	40.1
<b>Religion</b>		
Orthodox	151	39.3
Protestant	182	47.4
Muslim	51	13.3
<b>Age</b>		
15-30	129	33.6
30-50	128	33.3
>50	127	33.1
<b>Educational status</b>		
Illiterate	80	20.8
Informal education	72	15.6
Elementary	88	22.9
High school	84	21.9
Higher education	60	18.8

N= 384

### Attitude of participants related to action to be taken after exposure, whether cured after onset of symptoms, constraints of control rabies and where to go if bitten by a rabid animal

The attitude of participants regarding rabies was assessed. Attitudes related to action to be taken after exposure, whether cured after onset of symptoms, constraints of control rabies and where to go if bitten by a rabid animal were included for the purpose. From all respondents, 46.9% knows the fatal nature of rabies after the onset of clinical signs. Regarding constraints of controlling rabies, 36.7% reported that lack of veterinary professional contribute to control of rabies in Nekemte and 28.6% reported lack of awareness (Figure 1).

### Practice of participants after the bite from rabies suspected animals and when taken for vaccination in Nekemte Town

Out of 149 dog owners, 30.2% used to have vaccination for their pets and from this, 42.7% believed in getting regular vaccinations. A traditional method of treatment was mentioned as the best option in most of the respondent as immediate action for dog bite (Figure 2).

### Community KAP about rabies in Nekemte town

Twenty three questions were asked for each respondent

regarding cause, ways of infection, clinical sign, prevention practices and treatment measures of rabies which resulted in a response of either, choose the correct answer (one mark) or wrong answer (zero mark) for each question. The number of questions for which the respondent gave correct responses was counted and scored. This score was then pooled together and the mean score was computed to determine the overall KAP of respondents. Respondents who scored greater than or equal to the mean value (Mean=9.5) were grouped in good KAP and less than the mean value were grouped in poor KAP level. The data show that about 53.1% of the study participants were found to have good KAP on rabies and 46.9% were found to have poor KAP level.

### Factors associated with community KAP on rabies in Nekemte town

Association between independent variables and KAP scores on rabies was calculated using Pearson's Chi square (Table 3). There was significantly association between KAP scores and sex  $\chi^2$  (= 18.06,  $p < 0.08$ ). There was also significant association between KAP scores and age ( $\chi^2 = 85.4$ ,  $p < 0.00$ ). The good scores were highest in the age group of 15-30 (69%) among other age groups. Educational status was significantly associated with KAP scores ( $\chi^2 = 336.99$ ,  $p < 0.00$ ). All the respondents in primary and secondary school and higher education levels had good KAP of rabies.

### DISCUSSION

Despite its considerable negative effects, rabies in Ethiopia is among the neglected zoonotic diseases. In addition to this, there is little awareness regarding the disease and most prefer traditional managements either for the dog or their bites (Deressa et al., 2010; Yimer et al., 2002).

Of these respondents, 40.4% had misunderstanding of the cause of rabies, indicating that most of respondents believe that the disease in dogs is caused by spiritual and unknown cause. This KAP analysis revealed that 88.5% of respondents recognize rabies as danger and a fatal disease. This result is almost consistent with a study conducted in the city of New York, USA, reporting that 94.1% of the study participants know rabies as a killer disease (Hosmer and Lemeshow, 2000). The little difference may be due to presence of education on rabies in the town at this year. 97.4% of the respondent know that dogs are the most transmitters (source) of rabies. This result is almost consistent with a study conducted in the Gondar district reported that almost all respondent knows that dogs are most source of rabies followed by cats (Reta et al., 2015). The little difference may be due to presence of education on rabies in this town during this year. In this study, about 40.6% of the respondents were aware of common clinical signs of rabies in animals. This

**Table 2.** Knowledge of participants related to cause, ways of getting rabies, clinical signs and fatal nature of rabies in Nekemete town, 2016.

Characteristics	Frequency	%	Characteristics	Frequency	%
<b>Causes of rabies</b>			<b>If not treated</b>		
virus	229	59.6	The person survives	12	3.1
Spiritual	73	19.01	The person dies	340	88.5
I Don't know	82	21.4	Healed but not as before	32	8.3
<b>Ways of getting rabies</b>			<b>Symptom of rabies in human</b>		
Contact	95	24.7	Paralysis	146	38
Eating rabid animal meat	47	12.2	Hydrophobia	14	3.6
Living with rabid animal	27	7	Hyper salivation	71	18.5
ALL	215	56	Puppy movement in abdomen	153	39.8
<b>Treatable or curable after onset of symptom</b>					
Yes	180	46.9			
No	204	53.1			
<b>Animal involved in transmission</b>			<b>How soon symptoms appear</b>		
Dog	374	97.4	Immediately	109	28.4
Cat	10	2.6	1week	48	12.5
Donkey	0	0	1-2 weeks	147	38.3
Sheep and goats	0	0	1month	80	20.8
<b>Human to human transmission</b>			<b>Rabies signs in animals</b>		
Yes	212	55.2	Paralysis	72	18.75
No	172	44.8	Salivation	150	39.06
<b>Rabies seasonal occurrences</b>					
Yes	196	51	Hydrophobia	6	1.6
No	188	49	All	156	40.6
<b>If yes; season of occurrence</b>			<b>Rabies prevention</b>		
Summer	160	81.6	Eliminate stray dogs	24	6.3
Autumn	20	10.2	Vaccination	259	67.4
Spring	9	4.5	Herbal medicine application	101	26.3
Winter	7	3.5			
<b>Curing rabies</b>			<b>How a person is prevented from getting rabies?</b>		
Herbal medicine	104	27.1	Avoiding being bitten	116	30.2
Praying	8	2.11	Vaccinating pets	268	69.8
PEP	272	70.8	Via good nutrition	0	0

N=384

finding is supported by study done in Debre-Tabor (Awoke et al., 2015).

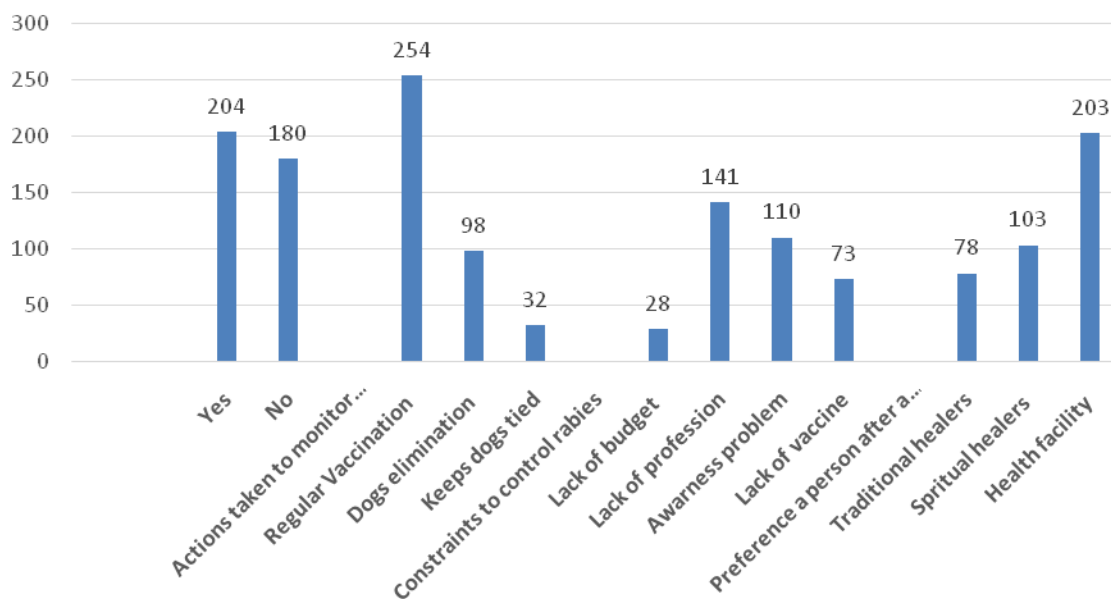
This study revealed that, 18.5% of the respondents know wound washing as an immediate action to mitigate the unnecessary outcomes after a dog bite. This result is highly lower than that of studies done in Bhutan where majority of respondents were aware of wound washing with soap and water after animal bite (Tenzin et al.,

2012). This difference might be due to respondents believe, cultural set up and lack of awareness. In this study, 35.7% of the respondents used to visit health facilities to get medical care after being bitten by dogs, and this finding is almost in agreement with a study done in Sri Lanka where almost all the interviewed ones agreed to consult health professional in case of animal bite (Matibag et al., 2007). The slight difference appreciated

**Table 3.** Relationships between KAP scores about rabies and some key independent variables among study respondents of Nekemte town, 2016.

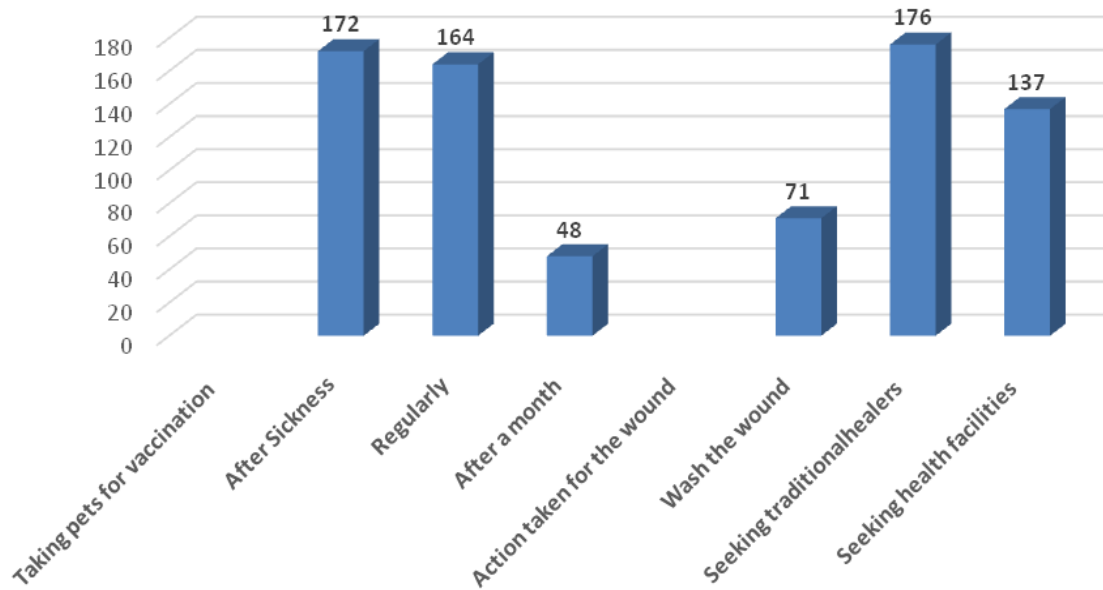
Variable	Good	Poor	$\chi^2$	P-value
<b>Sex</b>				
Male	130(56.5%)	100(43.5%)	18.06	0.08
female	74(48.05%)	80(51.9%)		
<b>Age</b>				
15-30	58(44.9%)	71(55.03%)	85.4	0.001
30-50	88(68.8%)	40(31.2%)		
>50	62(48.8)	65(51.2%)		
<b>Educational status</b>				
Informal education	9(12.5%)	63(87.5%)	336.99	0.001
Elementary	73(82.96%)	15(17.04%)		
High school	68(80.96%)	16(19.04%)		
Illiterate	9(11.3%)	71(88.7%)		
Higher education	49(81.7%)	11(18.3%)		
<b>Religion</b>				
Orthodox	80 ( 52.9)	71(47.01%)	15.6	0.831
Protestant	105 ( 57.6)	77(42.3%)		
Muslim	31 (60.7 )	20(39.2%)		

N=384.

**Figure 1.** Attitude of participants related to actions to be taken after exposure in Nekemete town, 2016

between these studies might be due to differences in the information exchange as well as availability of health centers in immediate vicinity. 45.8% of the participants in Nekemte area showed strong belief on traditional

medicine which is almost the same as study done in Gondar district in which 35% respondents prefer traditional medicine (Reta et al., 2015). Majority of the respondent indicated practicing regular dog vaccination



**Figure 2.** Practice of participants after the bite from rabies suspected animals and vaccination in Nekemte Town, 2016.

as an effective measure to control rabies. This finding is not consistent with results recorded in Sri Lanka and Bahir Dar in which the majority of the participants were in favor of rabies control programs and mainly focused on stray dog population control (Matibag et al., 2009; Tadesse et al., 2014). The difference may be due to increased health extension activities and the role of mass media in utilization and importance of dog vaccinations as compared to mass killing.

The findings of this study indicated that, about 53.1% of the respondents had good level of knowledge, attitude and practices for rabies. In contrast to this finding, higher knowledge, more positive attitudes and higher scores in practice indicators regarding rabies was reported from Sri Lanka (Matibag et al., 2009). This difference probably is explained by the lack of health education programs on rabies in Ethiopia.

The current study indicated an association between KAP and Sex ( $p < 0.08$ ), age ( $p < 0.001$ ) and educational status ( $p < 0.001$ ). The difference by sex could be due to the fact that males usually stay away from house as compared to females and this could create an opportunity to have a better access for information. Besides, educated individuals would have better information and understanding on the disease than those who are not educated (Andrea and Jesse, 2012; Tadesse et al., 2014). The statistically significant difference in KAP scores among age groups might be due to increased reading capacity and eagerness to search for new things on rabies, as students. All respondents with primary, secondary and higher education levels had good KAP of rabies.

The possible explanation could be that educated person would have better information access and can easily understand the disease and this finding is also in agreement with reports made by Andrea and Jesse (2012) and Tadesse et al. (2014). Purposive selection of the study site is one of the limitations.

## CONCLUSION AND RECOMMENDATIONS

Information on local beliefs and practices can identify knowledge gaps that may affect prevention practices and lead to unnecessary deaths. This study reveals important knowledge gaps related to, and factors influencing the prevention and control of rabies in Nekemte town. Of the participants, 35.7% visited health facilities after suspected dog bite, 18.5% knew the value of wound washing after the bite, 40.4% misunderstood the cause of rabies and 88.5% knew rabies as a dangerous as well as lethal disease.

Based on this brief conclusion, raising the community awareness through continuous education, increase knowledge regarding wound washing, seeking post-exposure prophylaxis and the need to vaccinate dogs, collaboration between veterinary and human health professionals/offices, provision of pre and post exposure vaccines and creating rapid means of communications are suggested.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest.

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*Full Length Research Paper*

# Magnitude and predictors of antenatal care (ANC) completion among mothers attending delivery and post-natal service in Jimma town, Oromia Region, South West Ethiopia

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Antenatal care is more beneficial in preventing adverse pregnancy outcomes when received early and continued till delivery. World Health Organization (WHO) recommends at least four antenatal care visits for women with no complication. Conversely, survey data from Ethiopia showed that only one third are initiated early. Thus, assessing magnitude and factors affecting antenatal care (ANC) completion is required for public health intervention planning and implementations. Accordingly, this study is conducted with the aim of assessing factors affecting ANC completion among mothers attending delivery and postnatal service in Jimma town health facilities. Institution based cross-sectional study design was employed from March to April 2016 in Jimma town. Three hundred and sixty six mothers who came for delivery and postnatal service were selected using simple random sampling technique. Interviewer administered questionnaires was to collect data. The data were entered into EPI data version 3.1 and analyzed using SPSS for Windows, version 20. Regression analyses were used to isolate independent predictor's antenatal completion. A total of 366 participants of the study, 364 underwent all the study components giving a response rate of 99.4%. Majority of the women (77.9%) have completed ANC service as per WHO recommendation. On a multivariable logistic regression analyses, educational status [AOR= 4.59, 95% CI: 1.2, 16.6]), women's decision making power [AOR=1.5, 95% CI: 0.03, 0.13]), knowledge about ANC [AOR= 2.45, 95% CI: 1.19, 5.03] and service satisfaction [AOR= 2.44, 95% CI: 1.03, 5.76]) were significantly associated with ANC completion. Findings of the study showed nearly a quarter of pregnant women still did not comply with the WHO recommendation. Therefore, programmes designed for promotion of ANC should be focused on educating a mother and improvement of service.

**Key words:** Antenatal care (ANC) completion, antenatal care, maternal health.

## INTRODUCTION

Pregnancy is a crucial time to promote healthy behaviors and parenting skills. Antenatal care (ANC) can play an

important role in improving maternal health through counseling prevention of delivery complications,

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motivating pregnant information seeking and encouraging women to have safe delivery at health institution (Ahmed and Das, 1992). During ANC visits, essential services such as tetanus toxoid immunization, iron and folic acid tablets, and nutrition education are also provided. Lack of antenatal care has been identified as one of the risk factors for maternal mortality and other adverse pregnancy outcomes in developing countries (Hollander, 1997). Moreover, a link is evident between lack of antenatal care and maternal mortality, perinatal mortality, low birth weight, premature delivery, pre-eclampsia, and anemia (Ahmed and Das, 1992; Hollander, 1997).

Globally, at least 160 million women become pregnant annually. Of these, 15% develop a serious complication. Over 30 million women in the developing world suffer from serious diseases and disabilities. When a woman dies in childbirth, her infant and any other children's survival is threatened. Every year, an additional 2 million children worldwide are maternal orphans. It is estimated that 150,000 African women die each year from causes related to pregnancy and childbearing, and that the life time risk of dying from maternal causes for African women is in the order of one in twenty five (Di Mario et al., 2005; World Health Organization (WHO), 2012).

According to demographic survey of Ethiopia (2014), a maternal mortality ratio (MMR) of Ethiopia was estimated to be 420 deaths per 100,000 live births (Ethiopia Mini Demographic and Health Survey (EMDHS), 2014). The same report stated the major causes of maternal deaths as obstructed/prolonged labor (13%), ruptured uterus (12%), severe preeclampsia/eclampsia (11%), malaria (9%) and complications from abortion (6%). All the aforementioned risks can be prevented by early initiation of ANC and having recommended minimum ANC visit. The major supply side constraints affecting maternal health are shortages of skilled midwives, weak referral system at health center levels, lack of inadequate availability of emergency obstetrics surgery equipment and under-financing of the service (Federal Democratic Republic of Ethiopia, 2010).

The world health education (WHO) recommends a minimum of four ANC visits to accomplish the essential level of ANC for every pregnant woman based on the time references of fetus development. The first visit which is expected to screen and treat anemia, syphilis, screen for risk factors and medical conditions that can be best dealt with in early pregnancy and initiate prophylaxis if requirement is recommended to be held by the end of the fourth month. The second, third and fourth visits are scheduled at 24 to 28, 32 and 36 weeks, respectively. All pregnant women should have at least four ANC assessments by or under the supervision of skilled attendant. These should, as a minimum, include all the interventions outlined in the new WHO antenatal care model and be spaced at regular intervals throughout pregnancy, commencing as early as possible in the first trimester (WHO and United Nations Children's Fund (UNICEF), 2003).

The content of services received and the kinds of information given to women during their ANC visits are also important components of quality care. These services raise awareness of the danger signs during the pregnancy, delivery, and postnatal period, improve the health-seeking behavior of women, orient them to birth preparedness issues, and provide basic preventive and therapeutic care (Joyce et al., 2014).

One of the strategies aimed at addressing maternal mortality in developing countries is the implementation of focused ANC (FANC), which is the care a woman receives throughout her pregnancy. World Health Organization (WHO) in 2001 issued guidance on this new model of ANC for implementation in developing countries. The new FANC model reduces the number of required antenatal visits to four and provides focused services shown to improve both maternal and neonatal outcomes (EMDHS, 2014). Globally, progress has been made in terms of increasing access and use of antenatal care, although the proportion of women obtaining minimum of four visit is too low (United Nations Population Fund (UNFPA), 2011).

The country proportion of urban antenatal care service utilization in Ethiopia is 32% whereas in Oromia it is 32.7% (WHO, 2012). No specific study has been done on the magnitude and factors that affect ANC completion in Jimma town thus far. Thus, this study aimed to identify factors affecting pregnant mothers ANC completion in Jimma town and to disseminate the research result and recommendation accordingly to the concerned body.

## **MATERIALS AND METHODS**

### **Study design and area**

Institutional based cross-sectional study design was employed in Jimma town from March to April, 2016. Jimma town is located at 346 km south west of Addis Ababa. According to the national census of 2007, the projected total population of the town is 184925, of whom 94312 are men and 90613 women. According to this population, the number of pregnant women in Jimma town is 6287. Jimma has one governmental specialized hospital, one government general hospital, and four government health centers and from private clinics giving maternal and child health service actively throughout the year in the town.

### **Sample size and sampling technique**

Using the proportion of urban ANC four visit service utilization in Ethiopia of 32% (WHO, 2012), a margin of error of 5% and none response rate of 10%, a sample of 368 pregnant mothers were calculated. Study subjects were selected from eight health facility in Jimma town giving delivery service throughout the year for the study population; four health facilities were selected using simple random sampling. The 2015 fiscal year number of delivery reported from the clinics were used for proportional allocation to size for each health facilities.

### **Data collection, procedure and analysis**

Data was collected using structured questionnaire adapted after reviewing similar literature. The collected data reviewed and checked for completeness, accuracy and consistency by the supervisors and



investigator and correction action was taken prior to data collection to minimize errors. After that the data was double entered into EpiData v 3.1 and validated duplicated files. The statistical analyses were performed using a computer software package (SPSS for Windows, version 21.0 (SPSS, Chicago, IL, USA). The data were checked using frequencies and cross tabulations. Descriptive statistics (frequencies, percentage, mean and standard deviation) was computed to show pictures of the data. Statistical tests at 95% of Confidence Interval were made. Those variables with P-value less than 0.25 in bivariate analysis were selected by enter methods as candidate variables (clinical importance) for multivariate analysis. Model fitness for multivariate analysis (for the final model) was assessed by Hosmer and Lemeshow Test with chi-square of 3.961, degree of freedom of 8, and p value of 0.86. Multicollinearity and interaction between independent variables were checked and removed from analysis. Multivariate binary logistic regression analysis was used to identify the predictor variables. The adjusted odds ratios together with their corresponding 95% confidence intervals were determined.

### Ethical consideration

Ethical clearance was obtained from ethical review committee of the College of Health Science of Jimma University. Letter of cooperation and support from the university together with the ethical approval letter was presented to Oromia Regional Health Bureau and Jimma town administration. Successively letter of support was written to selected health facilities to get permission before the start of the data collection. Moreover, all the study participants were informed verbally about the purpose and benefit of the study along with their right to refuse. Confidentiality of the study participants was assured by using questionnaire identification number and privacy during the interview.

## RESULTS

### Socio demographic characteristics

Out of the total of 366 respondent living in Jimma town who planned to participate in the study, 364 were enrolled in the study, giving a response rate of 99.4%. ANC completion was 77.9%. Majority of the respondent were in the age between 15 and 24 years old (44.5%) followed by 25 to 34 age groups (42.3%), the rest were 34 years and above. The mean ages of the respondents were  $25.39 \pm 5.2$  years. Majority of the respondents were Oromo ethnic groups (56.8%), followed by Dawro (17.5%) and Amhara 61 (16.7%). Most of the study subjects (94.8%) were married. Concerning respondents occupation, majority of them were house wife (55.5%) followed by private employed (30.6%) and government employed (13.9%), respectively. Majority of respondents' (44.8%) income lies in  $\leq 1500$  birr followed by 1501 to 2999 birr (30.6%). Most mothers attended (43.2%) primary school while other (38.5%) attended secondary (12.0%). However, few (6.3) of the respondent cannot read and write as shown in Table 1.

### Information related factors

Regarding to information about ANC utilization; 298 (81.4%) of the respondent have access to information and from those respondent, 226 (79.3%) visited four

times and above, the major source of information was mass media (both TV and Radio) 170 (46.4%), followed by HEWs and HAD 99 (27.0%) (Table 2).

### Reason for not completing ANC visit

Among the total respondents included in this study, 81 (22.1%) of respondent did not completed their ANC follow-up or not visit at least four.

The major reason for not completing were due to long waiting time at health facility 23 (28.3), being expected at health 19 (23.4), not satisfied with previous visit 17 (20.9), work overload 16 (19.7), and husband disapproval 6 (7.4).

### Obstetric history related factors

From the total respondents, majority of them 238 (65.0%) 1 to 2 children; followed by 115 (31.4%), 3 to 4 children. Sixty four (17.5%) of them experienced abortion in their life time; of these, 51 (79%) completed ANC visit for the recent pregnancy and 13 (20%) not completed. The proportion of respondents who made their first ANC within the recommended time (before or at 16 weeks of gestation) is 320 (87.4%). Majority of the respondents completing ANC were respondent who had 1 to 2 children; 173 (60.7%) followed by 3 to 4 children 101 (35.4%). Of those that does not complete ANC were experienced 13 (16%) of abortion in their life time. Concerning weather the resent pregnancy was planned or not, 252 (68.8%) of pregnancy was planned. Of these, 230 (80.7) completed ANC and 22 (27.1) not completed and 114 (31.1%) were not planned from these 55 (19.3) complete and 59 (72.8%) not complete ANC (Table 3).

### Knowledge of respondent

The knowledge status of respondents was assessed by five knowledge related questions reviewed and adapted from different literatures. Among respondents included in this study, 140 (38.3%) women had good knowledge, whereas 226 (61.7%) of the respondents had poor knowledge.

### Women's decision making power

The decision making status of women was assessed by five decision making questions; and those women who can decide by themselves or jointly with their partners were declared as had decision making power; based on these assessment, 210 (73.6%) women who completed their ANC follow up had decision making power, whereas only 14 (17.2%) of women who did not complete ANC follow up had decision making power.

**Table 1.** Socio-demographic characteristics with ANC completion cross tabulation of study among respondents of Jimma town 2016.

Socio-demographic characteristics		All mothers		ANC completion			
		Total		Yes (n=285)		No (n=81)	
		N	%	Frequency	%	Percent	%
Age in years	15-24	155	42.3	110	38.6	45	56.6
	25-34	185	50.5	150	52.6	35	43.2
	≥35	26	7.1	25	8.8	1	1.2
Ethnicity	Oromo	208	56.8	165	57.9	43	53.1
	Amhara	61	16.7	37	13	24	29.6
	Dawaro	64	17.5	56	19.6	8	9.9
	Yem	12	3.3	9	3.2	3	3.7
	Others *	21	5.7	18	6.3	3	3.7
Religion	Muslim	181	49.5	146	51.2	35	43.2
	Orthodox	119	32.5	93	32.6	26	32.1
	Catholic	7	1.9	3	1.1	4	4.9
	Protestant	59	16.1	43	15.1	16	19.8
Marital status	Single	8	2.2	8	2.8	0	0
	Married	347	94.8	272	95.4	75	92.6
	Divorced	11	3	5	1.8	6	7.4
Husband's educational status	No formal education	13	3.6	10	3.7	3	3.9
	Primary	130	35.5	97	35.5	33	42.9
	Secondary	145	39.6	115	42.1	30	39
	Above secondary	62	16.9	51	18.7	11	14.3
Mother's occupation	Gov't employee	13	3.6	46	16.1	5	6.2
	House wife	130	35.5	151	53	52	64.2
	Private	145	39.6	88	30.9	24	29.6
Income of the respondent	≤1500	62	16.9	116	40.7	48	59.3
	1501-3000	51	13.9	91	31.9	21	25.9
	≥3000	203	55.5	78	27.4	12	14.8

\*Tigre, Kafa and Gurage.

### Satisfaction level of respondents

The satisfaction level of respondents was measured by nine satisfaction related questions by likert scale degree of measurement as strongly dissatisfied to strongly satisfied. Based on these, the mean score of satisfaction level was computed and become  $33 \pm 4.5$ . So, 138 (37.7%) women completing ANC service were not satisfied and 54 (14.7%) women not completing ANC were not satisfied.

### Factors affecting ANC completion

As shown in Table 4, education status of the mother, knowledge, satisfaction level and decision making power

were significantly associated with ANC completion.

On a multivariable logistic regression analyses, after adjusting for other variables, having educational status of secondary school [AOR 4.59 95% CI (1.2, 16.6)], having good knowledge about ANC completion [AOR 2.45 95%CI (1.19, 5.03)], decision making power [AOR CI 1.5 95% (0.03, 0.13)], and being satisfied with service given were 2.44 (1.03, 5.76) positively associated with ANC completion (Table 5).

### DISCUSSION

This study assessed magnitude and factors affecting completion of ANC visit in Jimma town of Oromia region. According to this particular study ANC completion of

**Table 2.** Information characteristics with ANC completion cross tabulation of the respondents in Jimma town; 2016.

Information related factors		ANC completion			
		Yes (n=285)		No (n=81)	
		Frequency	%	Frequency	%
Have access to information	Yes	226	79.3	72	88.9
	No	59	20.7	9	11.1
Source of information	Mass media(TV & radio)	119	41.8	51	62.9
	HEW and HDA	83	29.1	16	19.7
	Other*	24	8.4	5	6.1

\*Is friends, neighbors, family members, newspaper.

**Table 3.** Obstetric related characteristics of the respondents cross tabulation with ANC completion in Jimma town, 2016.

Obstetric history related factors		ANC completion			
		Yes (n=285)		No (n=81)	
		Frequency	%	Frequency	%
Number of pregnancy	1-2 pregnancy	173	60.7	65	80.2
	3-4 pregnancy	101	35.4	14	17.2
	≥5 pregnancy	11	3.8	2	2.4
Experienced abortion in her life time	Yes	51	17.9	13	16.0
	No	234	82.1	68	84.0
Number of children	1-2	173	60.7	65	80.2
	3-4	101	35.4	15	18.5
	≥5	11	3.9	1	1.2
Planned pregnancy	Yes	230	80.7	22	27.1
	No	55	19.3	59	72.8
Age of pregnancy at first visit	1st Trimester	252	88.4	68	83.9
	2nd Trimester	22	7.7	11	13.5
	3rd Trimester	11	3.8	2	2.4

women living in Jimma town were 285 (77.9%). This study finding is inconsistent with mini EDHS2014 which is 32% (WHO, 2012). The difference may be due to the time difference between current study and mini EDHS. And may be because of high coverage of health facility in the town. The finding is in line with the study done in Amhara Region Dembecha district 80% and Asossa Benshagulmumz 77.7% (Ang et al., 2010; Aregay et al., 2014). Also, consistent with the study conducted in rural West Sumatra, Indonesia which is 77.9% (Ilir et al., 2009).

The finding is significantly high comparing prospective observational study done in Zambia, 22%, Kenya, 43% and the Pakistan site (24%) (Bahilu et al., 2009). This may be due to methodological and geographical difference.

The result is higher than Jimma health office report of 2015. This is may be because of the recording and reporting problem. The major reason for not completing were (32.0%) due to long waiting time at health facility (22.2%), being expected at health (19.7%), work overload, and not satisfied with previous visit. From respondents in Yem special zone, the main reasons for not utilizing ANC is that they were apparently healthy during their last pregnancy, family matters, lack of awareness, too far facility, no husband support, and long waiting time (Edward, 2011).

The proportion of respondents who made their first ANC within the recommended time (before or at 16 weeks of gestation) is 87.4%. This was significantly higher than the previous report by mini EDH 2014 which

**Table 4.** Bivariate analysis used to assess Factors affecting ANC completion in Jimma town 2016.

Parameter	ANC completion		COR (95% CI)	P-value	
	Yes (n=285)	No (n=81)			
Age of in years	15-24	110	45	1	0.025
	25-34	150	35	0.098 (0.13, 0.743)	
	≥35	25	1	0.171 (0.022, 1.30)	
Mother's occupation	Gov't employee	46	5	2.509 (0.898, 7.01)	0.079
	House wife	151	52	0.792 (0.45, 1.373)	
	Private	88	24	1	
Income of the respondent	≤1500	116	48	1	0.005
	1501-3000	91	21	0.372 (0.186, 0.74)	
	≥3000	78	12	0.667 (0.30, 1.441)	
Knowledge status	No (poor)	41	40	1	0.01
	Yes (good)	99	186	1.9 (1.16, 3.17)	
Educational status of the mother	No education	10	3	1	0.095
	Primary	97	33	2.16 (0.8, 5.3)	
	Secondary	115	30	13.4 (1.3, 8.5)	
	Above secondary	51	11	6.0 (1.7, 20.8)	
Access to information	Yes	226	72	1	0.054
	No	59	9	0.47 (0.2, 1.01)	
Source of Information	Media (TV, Radio)	119	51	1	0.03
	HEW and HAD	83	16	2.22 (1.19, 4.17)	
	Others	24	5	2.06 (0.74, 5.69)	
Women's decision making power	Had no decision making power	75	67	1	<0.01
	Had decision making power	210	14	13.4 (7.11, 25.23)	
Faced inconvenience for ANC service	No	37	44	0.35 (0.209, 0.589)	<0.01
	Yes	65	220		
Satisfaction level	Poor (≤mean)	27	54	1	0.004
	Good (>mean)	147	138	2.13 (1.27, 3.57)	
Parity of mother	1-2	173	65	1	0.003
	3-4	101	14	2.53 (1.37, 4.66)	
	>5	11	2	4.13 (0.523, 32.65)	

is 39.6% and Kembata Tembaro zone (31.4%) (Federal Democratic Republic of Ethiopia, 2010; Osorio et al., 2014). This may be attributed to the time difference between current study and mini EDHS survey, that there could be improvement in accessing and utilizing health care service through time and geographical variation.

Women's decision making power is independent

predictor of ANC completion; those women who had decision making power were 1.5 times more likely to complete ANC service than those who had no decision making power. Review of the literature done by USAID reported substantial restrictions on women autonomy and involvement in decision-making (Chompikul and Isaranurug, 2008; USAID, 2012). Study conducted in

**Table 5.** Multivariable logistic regression model predicting factors affecting ANC completion in Jimma town, 2016.

Predictors	ANC completion		COR(95%CI)	AOR (95% CI)	
	Yes (n=285)	No (n=81)			
Age of the mother	15-24	110	45	1	1
	25-34	150	35	0.098 (0.13, 0.743)	1.3(0.63, 2.7)
	≥35	25	1	0.171 (0.022, 1.30)	11.1 (0.43, 288)
Mother's occupation	Gov't employee	46	5	2.509 (0.898, 7.01)	1
	House wife	151	52	0.792 (0.45, 1.373)	0.37 (0.08, 1.6)
	Private	88	24	1	0.66 (0.15, 2.78)
Income of the respondent	≤1500	116	48	1	1
	1501-3000	91	21	0.372 (0.186, 0.74)	1.48 (0.62, 3.5)
	≥3000	78	12	0.667 (0.30, 1.441)	1.8 (0.64, 5.4)
Knowledge status	No (poor)	41	40	1	1
	Yes (good)	99	186	1.9 (1.16, 3.17)	2.45 (1.19, 5.03)
Educational status of the mother	No formal education	10	3	1	1
	Primary	97	33	3.4 (1.3, 8.5)	2.1 (0.60, 7.9)
	Secondary	115	30	2.16 (0.8, 5.3)	4.59 (1.2, 16.6)
	Above secondary	51	11	6.0 (1.7, 20.8)	0.18 (0.25, 13.2)
Source of Information	Media (TV, Radio)	119	51	1	1
	HEW and HAD	83	16	2.22 (1.19, 4.17)	1.37 (0.59, 3.20)
	Other	24	5	2.06 (0.74, 5.69)	0.84 (0.23, 3.04)
Women's decision making power	Had no decision making power	75	67	1	1
	Had decision making power	210	14	13.4 (7.11, 25.23)	1.5 (0.03, 0.13)
Faced Inconvenience at Health facility	No	37	44	1	1
	Yes	65	220	0.35 (0.21, 0.58)	0.61 (0.25, 1.46)
Satisfaction level	Poor (≤mean)	27	54	1	1
	Good (>mean)	147	138	2.13 (1.27, 3.57)	2.44 (1.03, 5.76)
Parity of the mother	1-2	173	65	1	1
	3-4	101	14	2.53 (1.37, 4.66)	2.7 (1.2, 6.4)
	>5	11	2	4.13 (0.523, 32.65)	0.72 (0.28, 18.8)

Model fitting testing was made by HosmerLemshow's goodness-of-fit test. And produce chi-square of 3.96 with p-value of 0.861 and 8 degree of freedom hence the model was good for the data.

AbunaGndaberet also revealed that women having decision making power were 8.1 times more likely to utilize ANC than women having no decision making power and study done in Yem special woreda husband, approval is the main factor of ANC utilization (Edward, 2011; Zeine et al., 2010).

Women having good knowledge for ANC service were 2.4 times more likely to complete ANC visit than who have poor knowledge. In the study conducted in Asosa Benshagulmumz, having knowledge on ANC service was independent predictor of ANC utilization. Women who

were knowledgeable on ANC service were 1.96 times more likely to utilize ANC service than women who were not knowledgeable about ANC services. Study conducted in Enderta district, Tigray, also reveals that women who had knowledge on danger signs were 2.3 times more likely to attend ANC service than those women who had no knowledge on danger signs (Ilir et al., 2009; Tekelab and Berhanu, 2014).

Maternal satisfaction on health facility services was found to be one of the predictor for ANC completion. Corroborating our finding, a study conducted in Indonesia

reported pregnant women who had poor satisfaction with antenatal care services were 4.6 times more likely to inadequately utilize the antenatal care compared to those who had high satisfaction (Chompikul and Isaranurug, 2008; Aregay et al., 2014). Being satisfied on health service, delivery potentially motivates mothers to visit health facility.

Educational status of women was also found as independent predictor for ANC utilization in the study area. Having a higher educational attainment is strongly associated with high ANC completion. The results showed women who had completed secondary education were 4.5 times more likely to complete ANC follow up than those who are not educated. Many study conducted previously support this finding. A study conducted in Abuna Gndeberet also presented mothers who did not have formal education 21% times less likely to utilize ANC service than those having formal education. The finding was also consistent with study conducted in Enderta district, Tigray, who reported, women who had completed secondary school and above were 2.5 times more likely to complete ANC service than illiterate women (Aregay et al., 2014; Gurmessa, 2009). Study conducted in Yem spatial woreda also reveals that mothers who learn secondary and above were 3.9 times more likely to utilize ANC service (Amentie, 2015; Desalegn et al., 2014).

Similarly, in Nigeria, educated women are more likely to report four or more visits to ANC compared to uneducated one with odds of utilizing ANC among women who attended secondary school and above were 7.6 times more than women who were illiterate, whereas women who were able to read and write were 3.18 times more likely to utilize ANC service than women who were illiterate (Bahilu et al., 2009). Education of mother's increases women's enhancement knowledge regarding benefits of maternal health services. Education is likely to enhance females' autonomy so that women develop greater confidence and capability to make decisions about their own health.

### Limitation of the study

Since this study used cross-sectional study design, it does not show temporal relationship between dependent and independent variables. Due to limited literature, it was difficult for further comparison and discussion.

### CONCLUSION AND RECOMMENDATIONS

This study revealed that nearly one fourth of women in Jimma town attending health facilities did not complete their ANC service as per WHO recommendation. The major reason for not completing ANC visit were, due to long waiting time at health facility followed not satisfied

with previous visit and being healthy. The proportion of mothers who made their first ANC within the recommended time (before or at 16 weeks of gestation) was very high when compared with other study (United Nations Population Fund (UNFPA), 2011; Aregay et al., 2014). Concerning factors affecting ANC completion, knowledge status, decision making power, satisfaction for health facility services and age were an independent predictors of ANC completion. For policy maker, it is better if policy makers made an effort to incorporate maternal and child health issues in school curriculum by doing that young ladies can have enough knowledge on MCH service like ANC, delivery and PNC. Making an effort towards women's empowerment, Regional Health Bureau, Jimma town health offices continue their current and existing efforts and strengthening urban health extension workers so that mothers can have enough information about ANC completion. In capacity building for service providers by giving on job training, regular supportive supervision and taking corrective measures to ensure good governance and increasing satisfaction of the client. Health institution and service provider of health facilities have to prepare attractive and convenient maternal waiting area. Service providers should give priority for mothers to come for MCH service and by doing that decreasing waiting time and increasing satisfaction, give integrated MCH service, council and give relevant information about ANC to mothers so that the knowledge status can be increased. Urban health extension workers should create awareness to the community and refer pregnant mothers early as much as possible. For researcher, it will be more valuable if further studies will be conducted on this subject matter with alternative study design so as to find more factors associated with ANC completion.

### CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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