

## PREVALENCE OF FEMALE GENITAL MUTILATION IN ETHIOPIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

Acheneff Asmamaw Muche, MPH, MHSc<sup>1</sup>, Abadi Kidanemariam Berhe, MSc<sup>2</sup>,  
Getachew Mullu Kassa, MSc<sup>3</sup>, Gedefaw Abeje Fekadu, MPH<sup>4</sup>

### ABSTRACT

**BACKGROUND:** Female Genital Mutilation (FGM) is a major harmful traditional practice that affects the health and well-being of women and girls. FGM is widespread across Ethiopia with a varying degree. Even though, there are various studies conducted on prevalence of FGM in Ethiopia, it has inconsistent findings. Therefore, this review was conducted to estimate the pooled prevalence of FGM among women and children and its regional variations in Ethiopia.

**METHOD:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guideline was followed to review published and unpublished studies conducted in Ethiopia. The databases used were; PubMed, Google Scholar, CINAHL and AJOL. Data were extracted using the Joanna Briggs Institute tool for prevalence studies. The meta-analysis was conducted using STATA version 14 software. The heterogeneity and publication bias was assessed using the  $I^2$  statistics and Egger's test respectively. Descriptive information of studies was presented in narrative form and quantitative results were presented in forest plots. Random effects model was used to estimate the pooled prevalence of FGM with the corresponding 95% confidence interval.

**RESULTS:** A total of 25 studies were included in the analysis. Twenty articles included 44,283 participants and 14 articles with 38,230 participants to estimate the pooled prevalence of FGM among women and children less than 15 years respectively. The pooled prevalence of FGM among women and children aged less than 15 years in Ethiopia was 84.6% (95% CI: 80.51%, 88.7 %) and 49.79% (95% CI: 41.91%, 57.68%) respectively. The highest prevalence of FGM among women was observed in Somali region (91.09 % (95 % CI: 85.75, 96.44)), and the lowest reported in Harari region (79.50% (95 % CI: 76.77, 82.23)). The highest prevalence of FGM among children less than 15 years was observed in South Nation Nationalities and Peoples Region (SNNPR) (82.20% (95 % CI: 79.52, 84.88)) and the lowest reported in Harari region (19% (95 % CI: 16.35, 21.65)).

**CONCLUSION:** The prevalence of FGM is high in Ethiopia with a wide variation was observed across regions. Attention should be emphasized to end or reduce the practice, mainly at the high FGM clustered regions of Ethiopia.

**KEYWORDS:** Female genital mutilation, Harmful traditional practice, Ethiopia, Systemic review, Meta-analysis

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1 Department of Epidemiology and Biostatistics, Institute of Public Health, University of Gondar, Gondar, Ethiopia

2 College of Medicine and Health Sciences, Adigrat University, Tigray, North Ethiopia

3 College of Health Sciences, Debre Markos University, Debre Markos, Ethiopia

4 School of Public Health, College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia

## INTRODUCTION

Female Genital Mutilation (FGM), also known as 'female genital cutting' or 'female circumcision', refers to "all procedures involving partial or total removal of the female external genitalia or other injuries to the female genital organs for non-medical reasons<sup>1-3</sup>. FGM reflects the disparity between the genders, and it's a serious violation of human rights<sup>4</sup>.

World Health Organization (WHO) estimates, every year, more than two million girls are subjected to FGM<sup>5</sup>. Globally, FGM type II is the most frequently practiced form, representing an estimated 80% of all procedures<sup>6</sup>. While type III practiced about 10% of FGM in Africa. It is mostly practiced in Djibouti, Somalia, and Sudan<sup>7</sup>. The estimated prevalence of FGM in 27 countries across Africa ranged from < 1% in Uganda to 98% in Somalia<sup>3</sup>. According to the Ethiopian Demographic Health Survey (EDHS), the estimated prevalence of FGM among women (15-49 years) was 65%. However, there is a great inconsistency among different regions in Ethiopia ranges from 24.2% in Tigray to 98% and 99% in Afar and Somali regions respectively<sup>8</sup>.

Female genital mutilation mostly practiced on girls less than 15 years<sup>9</sup>. Even though the EDHS report showed more than 52.5% of girls who undergo FGM during the infancy period, it was practiced differently on the ethnic group, and across regions<sup>8</sup>. On the other hand, it was performed in the first week of birth in Northern Ethiopia regions (Tigray and Amhara), and much later or before marriage in the Southern Ethiopia regions (Oromia and SNNPR)<sup>10-12</sup>. Moreover, it is principally carried out by traditional birth attendants or old women by non-sterile sharp instruments<sup>10-13</sup>.

Besides, there is an international movement to halted the FGM and increased the awareness of its consequences, FGM still continues<sup>14-15</sup>. The 2005 Criminal Code of Ethiopia was implemented the articles 565 and 566 the FGM practice punishable by imprisonment from 3 months to 10 years<sup>16</sup>. However, the FGM law is not very effective as expected on the reduction of the practice of FGM. The reasons for continued FGM are the cultural value of the practices, and societies reflected as compulsory for a girl to become womanhood ritual.

It was also believed that FGM demanded to preserve a girl's virginity<sup>17-19</sup>.

Various studies show that FGM is widespread across Ethiopia with a varying degree. These studies reported inconsistently. There were also notable differences between regions of Ethiopia. In addition, EDHS data are not entirely consistent. The DHS data does not directly measure the FGM status of girls aged 0-14 years, however, pre-2010, the DHS surveys asked women whether they had a least one daughter with FGM. This data cannot be used to accurately estimate the prevalence of girls under the age of 15<sup>20</sup>. Whereas, from 2010, the DHS methodology changed so that women are asked the FGM status of all their daughters under 15 years. Therefore, this study was conducted to estimate the prevalence of FGM by summarizing the evidences on the prevalence of FGM among women and children in Ethiopia. Additionally, this study identified the prevalence and regional variations of FGM among women aged 15- 49 years and girls less than 15 years in Ethiopia.

## METHOD AND MATERIALS

### Study design and search strategy

A systematic review and meta-analysis was conducted using published and unpublished research on the prevalence of FGM among women and their daughters in Ethiopia from 1997 to October 11, 2017, were included in the review. Unpublished studies were retrieved from the official website of Addis Ababa University electronic database<sup>21</sup>. The databases used to search for studies were PubMed, Google Scholar, CINAHL, and African Journals Online. All search terms for; "Female genital mutilation OR cutting OR circumcision OR harmful traditional practices OR infibulation AND Ethiopia." were used separately and in combination using the Boolean operators like "OR" or "AND". The selected papers were fully reviewed and the required information for the systematic review was extracted and summarized using extraction table in Microsoft Office Excel software. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed throughout the review and analysis process<sup>22</sup>.

## Study selection and eligibility criteria

### Inclusion criteria

Any studies in Ethiopia that reported on FGM and fulfilled the following criteria were entered into the analysis, including the following factors: (1) the participants were women 15 years old and above and children less than 15 years; (2) Observational epidemiologic studies had reported prevalence or total of participants and number of FGM events; (3) studies used the outcome measure based on the World Health Organization (WHO), United Nations Children's Fund, and United Nations Population Fund definition of FGM. Female genital mutilation is defined as "all procedures involving partial or total removal of the external female genitalia or other injuries to the female genital organs whether for cultural or other non-therapeutic reasons"<sup>23</sup>; and (4) all published articles, thesis, and dissertations in English language journals from 1997 to October 11, 2017 were included in the review.

### Exclusion criteria

If studies failed to mention any of the above inclusion criteria it was excluded. In addition, studies were excluded if they were: (1) studies that do not include quantitative data on the prevalence FGM; (2) duplicate studies. In the case of duplicated publications, only the study containing the most important information in the context of prevalence and ascertainment methodologies or most recent results was included; and (3) Studies with methodological problems and review articles were excluded from the review.

### Data extraction and quality assessment

Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MASARI) was used for critical appraisal of studies<sup>24</sup>. The information required for the review was collected using the data extraction tool for prevalence studies prepared by Joanna Briggs Institute (JBI)<sup>25</sup>.

The main findings regarding the prevalence of FGM was summarized by two authors and excel sheet was prepared under subheadings agreed upon by all authors. The data collection tool contained information regarding the article author, the year of the study conducted, year of publication, sample size, response rate, study design, setting, mean age and prevalence of FGM. Additionally, the tool contains information regarding the percentage

of FGM among women, their children, and by the regional state was included in the data collection tool. Retrieved articles were assessed for inclusion using their title, abstract and then a full-text review of articles for quality was done before inclusion in the final review.

### Heterogeneity and publication bias

The heterogeneity test of included studies was assessed by using the  $I^2$  statistics and its corresponding p-value. The p-value for  $I^2$  statistics less than 0.05 was used to determine the presence of heterogeneity. Low, moderate, and high heterogeneity was assigned to  $I^2$  test statistics results of 25, 50, and 75% respectively<sup>26,27</sup>. The publication bias was assessed using the Egger regression asymmetry test<sup>28,29</sup>. For meta-analysis results which showed the presence of publication bias (Egger test =  $p < 0.05$ ), the Duval and Tweedie nonparametric trim and fill analysis using the random effect analysis was conducted to account for publication bias<sup>30</sup>.

### Statistical methods and analysis

Data were entered into Microsoft excel, and the meta-analysis was conducted using STATA version 14 software. Forest plots used to present the combined prevalence and 95% confidence interval (CI). To estimate the pooled prevalence of FGM with the corresponding 95% confidence intervals (CI) was computed by random effects models. For test results with significant variation across studies, the random effect analysis was used as a method of analysis<sup>26</sup>. Subgroup analysis was conducted by regions of Ethiopia.

## RESULTS

### Study selection

The review brought a total of 1,160 published articles and 7 unpublished reports. From this, 97 duplicate records were removed and 934 records were excluded after screening by title and abstract. A total of 136 full-text articles were screened for eligibility. From this, 37 articles were excluded since they failed to satisfy the eligibility and 11 articles were excluded by different reasons such as 8 articles focused on other harmful traditional practices and do not reported FGM, one article conducted on refugees which is different population characteristics, one repeated article, and one article has a methodological problem. Finally, 25 studies were included for the final analysis (Figure 1).

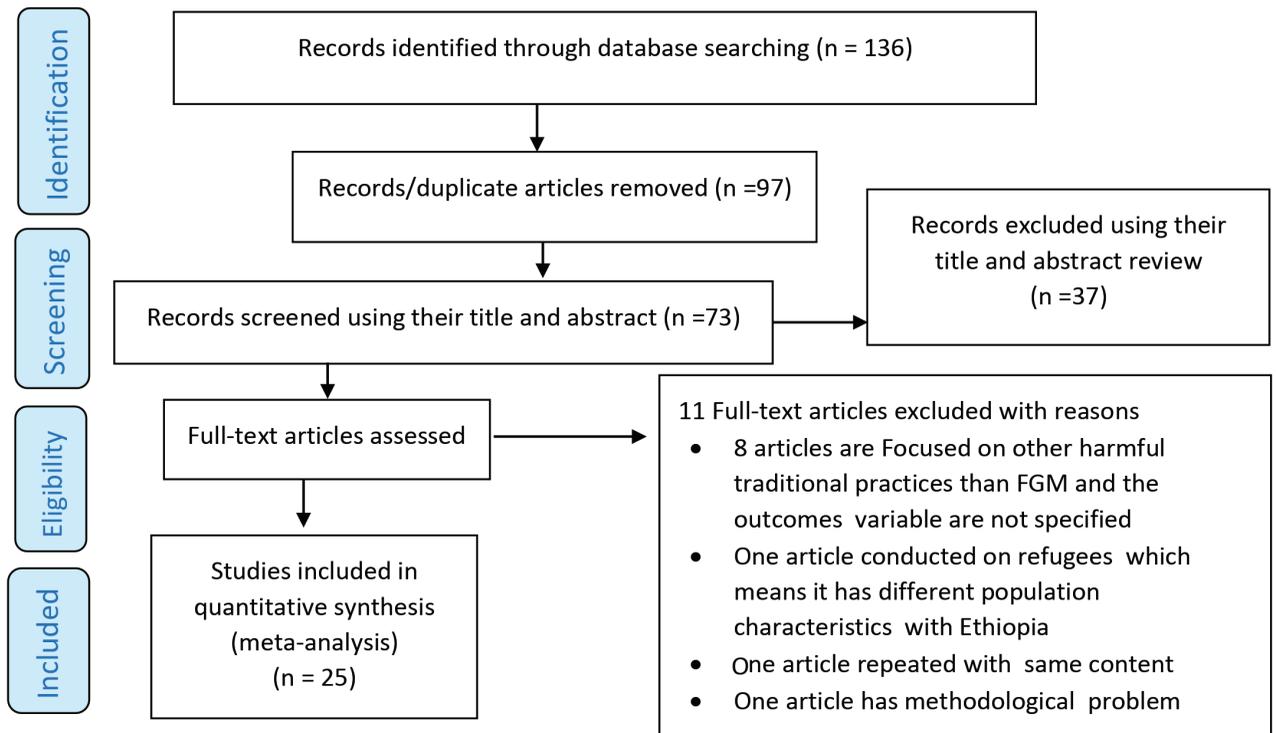


Figure 1: Flow diagram of the studies included in the Meta-analysis

### Characteristics of included studies

All included articles were cross-sectional studies. From 25 studies were included in the analysis, 20 articles included to identify the prevalence of FGM practices among women. The sample size of studies ranged from a minimum of 138 in a study conducted in Serbo town, Oromia region<sup>31</sup> to a maximum of 15,367 women, in a nationwide study<sup>32</sup>. A total of 44,283 participants were included in the review. The studies were conducted from 1997 to 2017 in different regions of the country (Table 1).

Fourteen articles were included in the Meta analysis to estimate the prevalence of FGM among children less than 15 years. The sample size of studies ranged from a minimum of 138 in a study conducted in Serbo town, Oromia region<sup>31</sup> to a maximum of 15,367 participants in a nationwide study<sup>32</sup>. A total of 38,230 participants were included in the review. The studies were conducted from 2000 to 2014 in different regions of the country (Table 2).

Table 1: Summary of studies included in the meta-analysis to estimate the prevalence FGM practice among women in Ethiopia, 1997–2017.

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
1.	Moges et al., 2015 <sup>33</sup>	Lejet Kebele, Demebecha Woreda, Amhara	Cross-sectional	April 27-May 4, 2014	Women who had daughter less than 5 years	Systematic random sampling	Mean $\pm$ SD= 29.35 $\pm$ 7.75 years	234	100%	1.55	94 (90.96, 97.04)
2.	Mulusew Andualem, 2016 <sup>34</sup>	Goncha Siso-Enessie District, Amhara region	Cross-sectional	September 2004	Women in reproductive age group (ages 15-49) and who had daughters less than five years of age	Systematic random sampling method	Range=15-24 years	718	98%	0.52	98 (95.98, 99.02)
3.	Bogale, Markos, & Kaso, 2014 <sup>11</sup>	Bale zone, Oromia region	Cross-sectional	April 18, 2014 to May 20, 2014.	Childbearing age women	Simple random sampling	Mean $\pm$ SD = 30 $\pm$ 9.7 years	619	97.6%	1.65	78.5 (75.26, 81.74)
4.	Hakim, 2001 <sup>35</sup>	Addis Ababa,	Cross-sectional	Jan-Dec, 1997	Childbearing age women	Simple random sampling	Mean $\pm$ SD = 25.9 $\pm$ 5.9 years	1481	100%	0.98	82.7 (80.77,84.63)
5.	Argaw & Fisseha, 2002 <sup>31</sup>	Serbo town, Jimma Zone, Oromia region	Cross-sectional	January, 2001	Mothers aged 15 years and above who had at least one daughter	Systematic random sampling method	---	138	100%	1.59	96.4 (93.29,99.51)
6.	Hussein, Adem, & Mohammed, 2013 <sup>36</sup>	Jigjiga town, Somalia region	Cross-sectional	January 1 to May 30, 2012	Women of reproductive age group (15-49 years of age)	Systematic random sampling method	Range=15 -49 years	323	100%	1.67	90 (86.73, 93.27)
7.	S. Rahlenbeck Mekonnen, & Melkamu, 2010 <sup>37</sup>	Oromia region	Cross-sectional	Ethiopia Demographic and Health Survey, 2005)	women aged 15–49 years	Multi-stage clustered sampling method	median age of 25 years	2221	--	0.68	88.4 (87.0, 89.73)

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
8.	Olijira, Assefa, & Dessie, 2016 38	Harara town, Harari	Cross-sectional	February 1 and 28, 2013	Women with at least one daughter younger than	Simple random sampling)	Range= 25–39 years	842	100%	1.39	79.5 (76.77, 82.23) (38)
9.	Yirga, Kassa, Gebremichael, & Ato, 2012 39	Kersa district, East Hararge, Oromia region	Cross-sectional	January to February 2008	Women of reproductive age (15–49 years)	Systematic random	---	858	100%	0.91	92.3 (90.52, 94.08)
10.	Gebremariam, Assefa, & Weldegebreal, 2016 40	Jigjiga district, Somalia region	Cross-sectional	February to March 2014	Female young-adult (10–24 years of age)	Multistage sampling technique	Mean ± SD=20 ±2.4 years	662	97.5%	1.47	82.6 ( 79.71,85.49)
11.	Setegn et al., 2016 32	Nation based	Cross-sectional	Data from EDHS 2000	Women of reproductive age (15–49 years)	Two-stage stratified cluster sampling	15-49 years	15,367	95.6%	0.23	79.9 ( 79.44, 80.36)
12.	M Andualem, 2013 41	GonchaSiso-Enessie District, East Gojjam Zone, Amhara region	cross-sectional	2012	Women in reproductive age group (15-49) w ho had daughter less than five years old	Simple random sampling ± 7 years	Mean ± SD= 29 ± 7 years	730	100%	1.54	77.70 (74.68,80.72)
13.	S. I. Rahlénbeck & Mekonnen, 2009 42	Amhara region	Cross-sectional	-	Women of reproductive age (15–49 years)	Stratified, two-stage clustered sample	Mean ± SD= 17.75 ±1.37 years	1942	96.8%	1.05	69 (66.94,71.06)

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
14.	Kilbret, Ejigu, Tiruneh, & Mekonnen, 2014 43	Debaylatgini District, Amhara region	Cross-sectional	16-30 of March 2013.	Women in reproductive age group with daughters of under five years old.	Systematic random sampling method	mean (±SD)= 29(±7) years	730	100	1.56	77.7 (74.65,80.75)
15.	Shiferaw, Deyessa, Fufa, Kinati, & Desalegn, 2017 44	Dale Wabera Woreda, Oromia Regional State	Cross-sectional	January, 2012	Female young-adult (10-24 years of age)	Multistage sampling ±1.32 years	mean ± SD = 16.93	769	96.4%	1.50	77.8 (74.86, 80.74)
16.	Abeya, Chuluko, & Gemeda 2017 45	Gewane Woreda, Afar region.	Cross-sectional	July 4 to 14, 2016.	Reproductive age women (15-49 years) who ever gave birth	Systematic random methods	mean ± SD = 32.69 ±7.53. years	792	93.7%	1.03	90.8 (88.79,92.81)
17.	Abdisa, Desalegn, & Tesew, 2017 46	Kebirbeyah Town, Somali Region.	Cross-sectional	Feb to March 2017	Women in reproductive age 15-49 years	Systematic random methods.	mean ± SD = 28.3 ± 6.16 years	320	94.9%	1.87	87.1 (83.43,90.77)
18.	Belda SS, Tololu AK, 2017 47	Wolisso woreda, Oromia region	Cross-sectional	July 18 to August 09/ 2009 July 18 to	Women of childbearing age	Systematic sampling technique	mean age = 33 years	384	95%	2.45	63.7 (58.89, 68.51)
19.	Tigist Moges Getanehe, 2017 48	Gursum Woreda, Somali Regional State	Cross-sectional	January 16 – 20, 2017	Women in reproductive age 15-49 years	Systematic sampling technique	Range= 15 to 45year	211	98%	0.68	99 (97.66, 100.34)
20.	Gebremichael, 2002 49	Jijiga town, Somali Regional State	Cross-sectional	December 2001	Women of reproductive age who's first born was or would have been 5 years or less	Multistage sampling	mean ± SD = 24.2 ± 4.5 years	872	95.5%	0.66	96 (94.70, 97.30)

FGM= Female Genital Mutilation

Table 2: Summary of studies included in the meta-analysis to estimate the prevalence FGM practice among children less than 15 years in Ethiopia, 2000–2014.

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
1.	Moges et al., 2015 <sup>33</sup>	Lejet Kebele, Dembecha Woreda Amhara region	Cross-sectional	April 27- May 4,	Women who had daughter less than 5 years	Systematic random sampling method	Mean $\pm$ SD= 29.35 $\pm$ 7.75 years	234	100%	3.10	34 (27.93, 40.07)
2.	Multusew Andualem, 2016 <sup>34</sup>	Goncha Siso-Enessie District, Amhara region	Cross-sectional	September 2004	Women in reproductive age group (ages 15-49) and who had daughters less than five years of age	Systematic random sampling method	Range=15-24 24 years	805	98%	1.76	49 (45.55, 52.45)
3.	Tamire & Molla, 2013 <sup>50</sup>	Hadiya Zone, SNNPR	Cross-sectional	January to February, 2011	Female young-adult (10-25 years of age)	Multi-stage cluster sampling) technique	Mean $\pm$ SD = 16.2 $\pm$ 1.35 years Range= 13-25 years	780	97.87%	1.37	82.2 (79.52,84.88)
4.	Shay, Haidar, & Kogi-Makau, 2010 <sup>51</sup>	Addis Ababa	Cross-sectional	August and June 2008	Female young-adult (10-24 years of age)	Simple random sampling	Median age being 9 years	407	92.1%	2.17	26.0 (21.74, 30.26)
5.	Argaw & Fisseha, 2002 <sup>31</sup>	Serbo town, Jimma Zone, Oromia region	Cross-sectional	January, 2001	Mothers aged 15 years and above who had at least one daughter	Systematic random sampling method	--	138	100%	4.13	62.3 (54.21, 70.39)
6.	S. Rahlbeck et al., 2010 <sup>37</sup>	Oromia region	Cross-sectional	Ethiopia Demographic and Health Survey, 2005	Mothers with daughters	Stratified, two-stage clustered sample	Median age of 25 years	1244	~	1.37	37.4 (34.71, 40.09)
7.	Oljira et al., 2016 <sup>38</sup>	Harara town, Harari	Cross-sectional	February 1 and 28, 2013	Women with at least one daughter younger than 12 year	Simple random sampling	Range= 25-39 years	842	100%	1.35	19.0 (16.35, 21.65)

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
8.	Yirga et al., 2012 39	Kersa district, East Hararge, Oromia region	Cross-sectional	January to February 2008	Women of reproductive age (15-49 years) who had at least one daughter	Systematic random sampling	~	858	100%	1.10	88.1 (85.93, 90.27)
9.	Setegn et al., 2016 32	Nation based	Cross-sectional	Data from EDHS 2000	Women of reproductive age (15-49 years) who had at least one daughter	Two-stage stratified cluster sampling	~	15,367	95.6%	0.29	47.8 (47.23, 48.37)
		Nation based	Cross-sectional	Data from EDHS 2005	Women of reproductive age (15-49 years) who had at least one daughter	Two-stage stratified cluster sampling	~	14,070	97.8%	0.39	37.7 (36.93, 38.47)
10.	M Andualem, 2013 41	GonchaSiso-Enessie District, East Gojjam Zone, Amhara region	Cross-sectional	2012	Women in reproductive age group (ages 15-49) and who had daughters less than five years of age	Systematic random sampling method	Mean ± SD= 29 ± 7 years	730	100%	1.79	62.7 (59.19, 66.21)
11.	S. I. Rahlenbeck & Mekonnen, 2009 42	Amhara region, Ethiopia	Cross-sectional	~	Mothers with daughters	Stratified, two-stage	Mean ± SD= 17.75 ± 1.37 years	1006	96.8%	1.51	64 ( 61.03, 66.97)
12.	Gajaa, Wakgari, Kebede, & Derseh, 2016 52	Hababo Guduru District, Western Ethiopia, Oromia region	Cross-sectional	April 5 to 26, 2014	Reproductive age mothers with at least one daughter under 15 years old	Systematic random sampling technique	Mean ± SD= 32.2 ± 7.2 years Range=17-49 years	610	98 %	2.02	48 (44.04, 51.96)

S.N	Author, Year	Study area	Study design	Study period	Study population	Sampling strategies	Age in years	Sample size	Response rate	SE	Prevalence of FGM (95% CI)
13.	Kibret et al., 2014 43	Debaytilatgin District, Amhara Region	Cross-sectional	16-30 of March 2013	Women in the reproductive age. group with daughters of less than five years old	Systematic random sampling method	Mean $\pm$ SD= 29 $\pm$ 7 years	730	100	1.79	62.7 (59.19, 66.21)
14.	Zewde, 2009 53	Addis Ababa	Cross-sectional.	--	Female young-adult (10-24 years of age)	Multistage sampling	Majority (62.2%) was in the age group of 11-15 years	409	92.1%	2.16	25.8 (21.56, 30.04)

FGM= Female Genital Mutilation SNNPR= South Nation Nationalities and Peoples' Region

### Prevalence of FGM in Ethiopia

The pooled prevalence FGM among women in Ethiopia was 84.6% (95% CI: 80.51%, 88.7%). However, statistically significant heterogeneity was observed

( $I^2=99.4%$ ), P-value of  $<0.001$ ). The analysis indicated that there was no publication bias when estimating FGM among women (Egger's test, P-value= 0.281, and Begg's test= 0.334) (Figure 2).

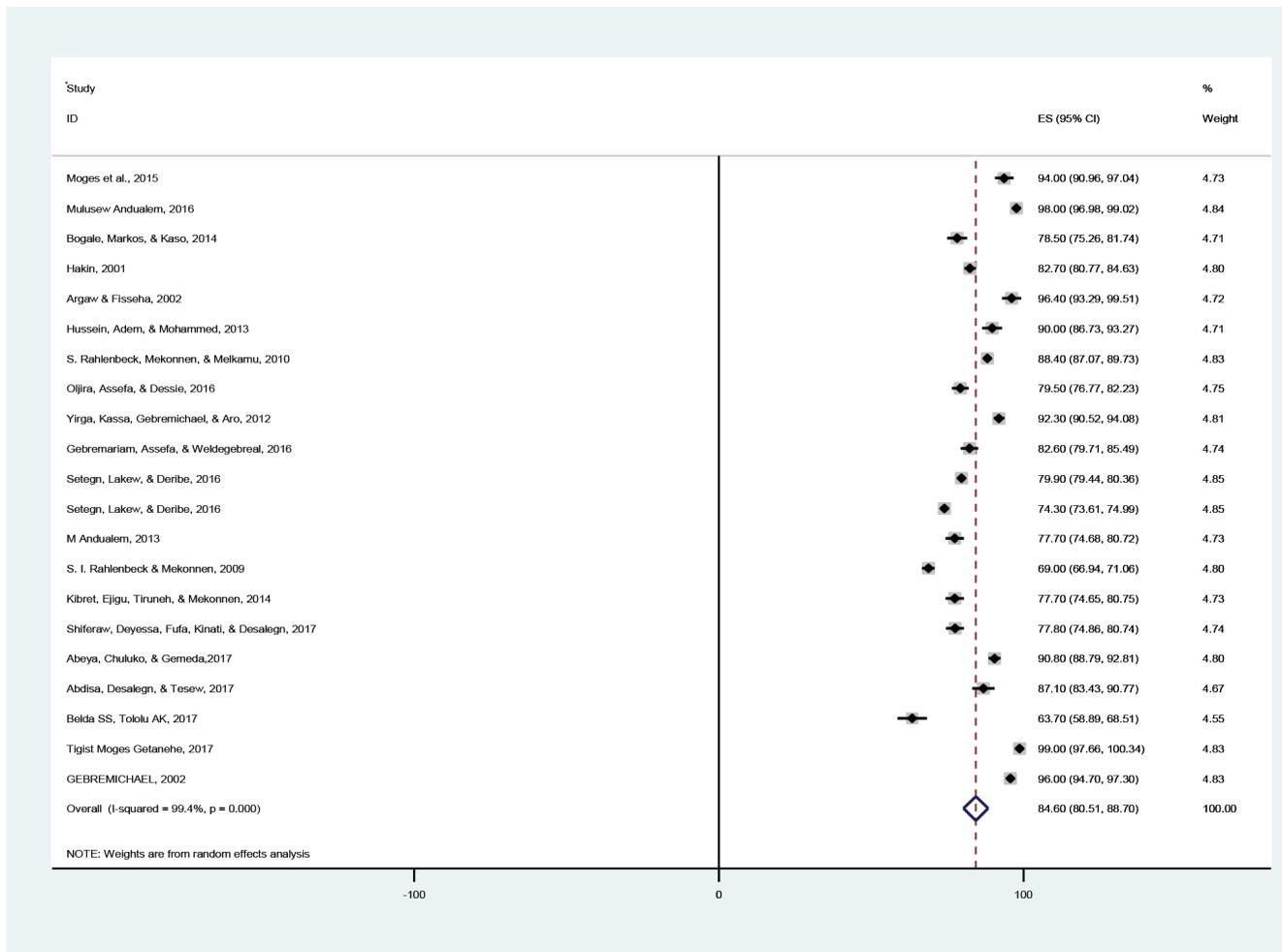


Figure 2: Prevalence of female genital mutilation among women in Ethiopia, 1997–2017

The overall pooled prevalence of FGM among children less than 15 years in Ethiopia was 49.79% (95% CI: 41.91%, 57.68%). The  $I^2$  test result showed high heterogeneity among studies included for this analysis

( $I^2=99.6%$ ,  $P <0.001$ ). Therefore, we used random effects model to estimate the pooled prevalence. The analysis did not show publication bias (Egger's test, P-value= 0.492, and Begg's test= 0.553) (Figure 3).

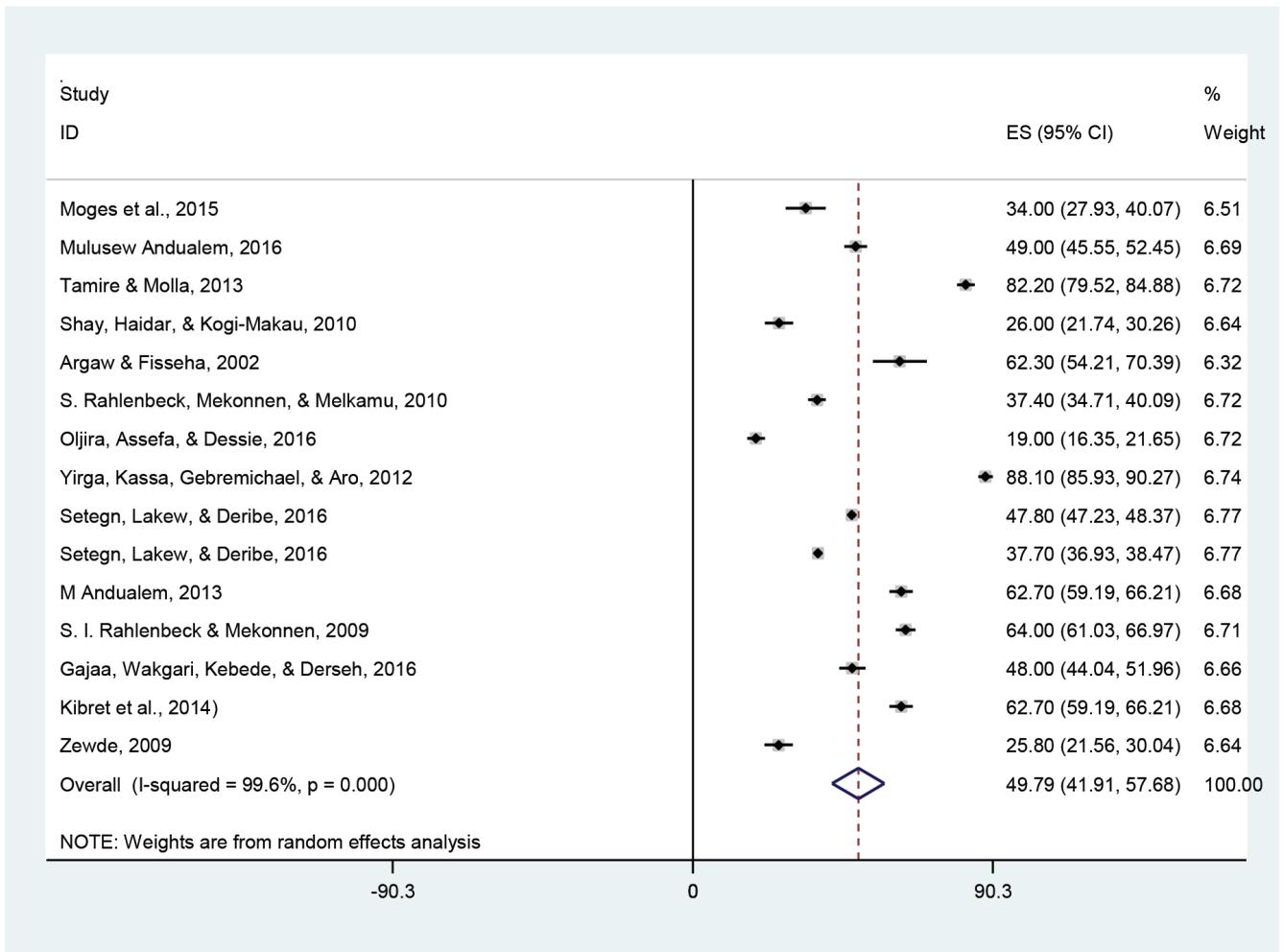


Figure 3: Prevalence of female genital mutilation among children less 15 years old in Ethiopia, 2000–2014

### Prevalence of FGM by Region

In the subgroup analysis of the regions of the country, the highest prevalence of FGM among women was observed in Somali region (91.09% (95% CI: 85.75, 96.44)), followed by Afar region (90.80% (95 % CI: 88.79, 92.81)). The pooled prevalence of FGM in

Amhara region and Oromia region was nearly similar which is 83.29 % (95 % CI: 69.88, 96.70) and 83.07% (95 % CI: 76.44, 89.70) respectively. On the other hand, the lowest prevalence was reported in Harari region (79.50% (95 % CI: 76.77, 82.23)) (Figure 4).

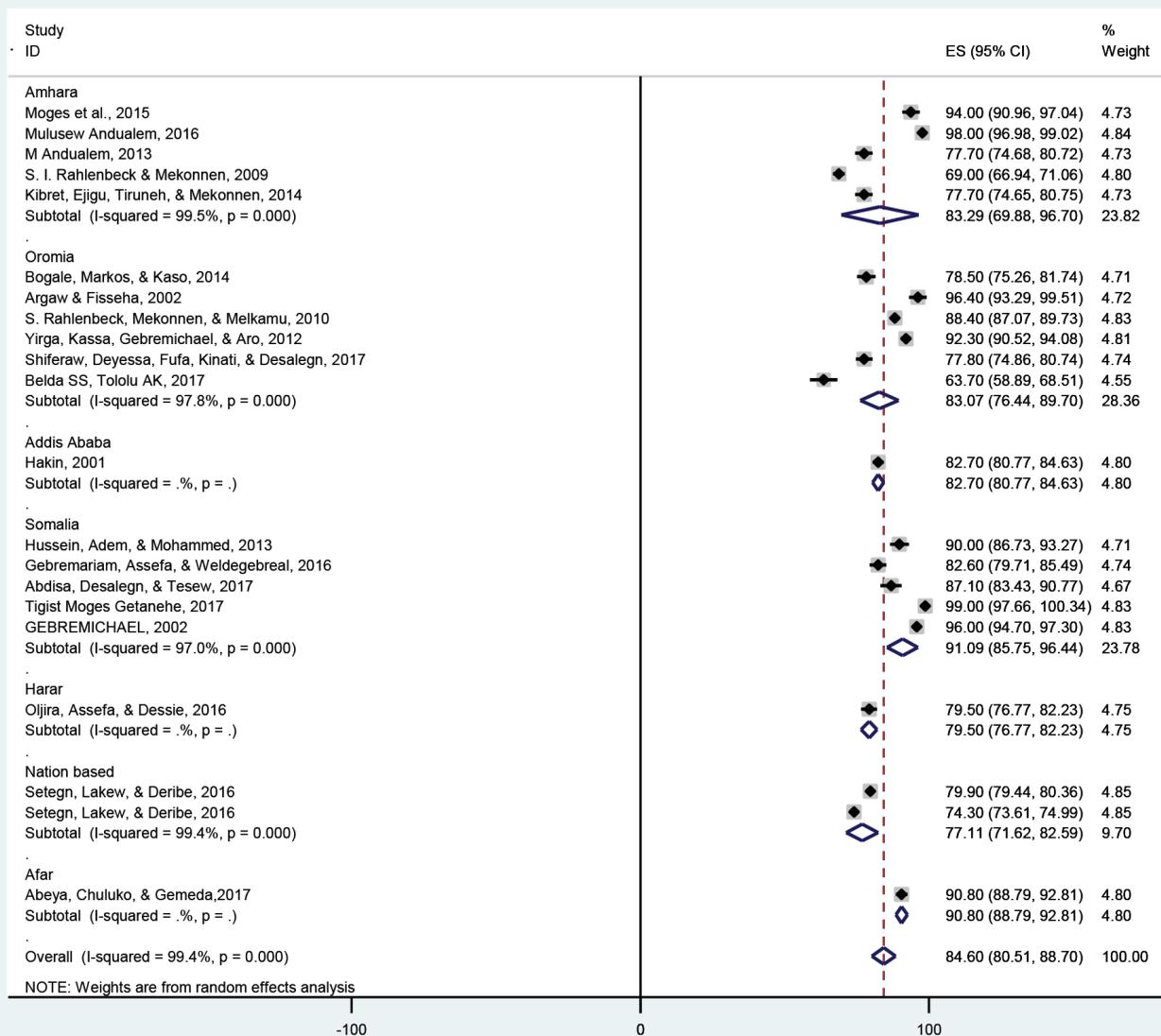


Figure 4: Variation in prevalence of female genital mutilation among women by region in Ethiopia, 1997–2017

The highest prevalence of FGM among children less than 15 years was observed in SNNPR (82.20% (95 % CI: 79.52, 84.88)) followed by Oromia region (58.95% (95 % CI: 29.85, 88.05)). While the lowest prevalence

was reported in Harari region (19% (95 % CI: 16.35, 21.65)) followed by Addis Ababa, capital city of Ethiopia (25.9% (95 % CI: 22.89, 28.91)) (Figure 5).

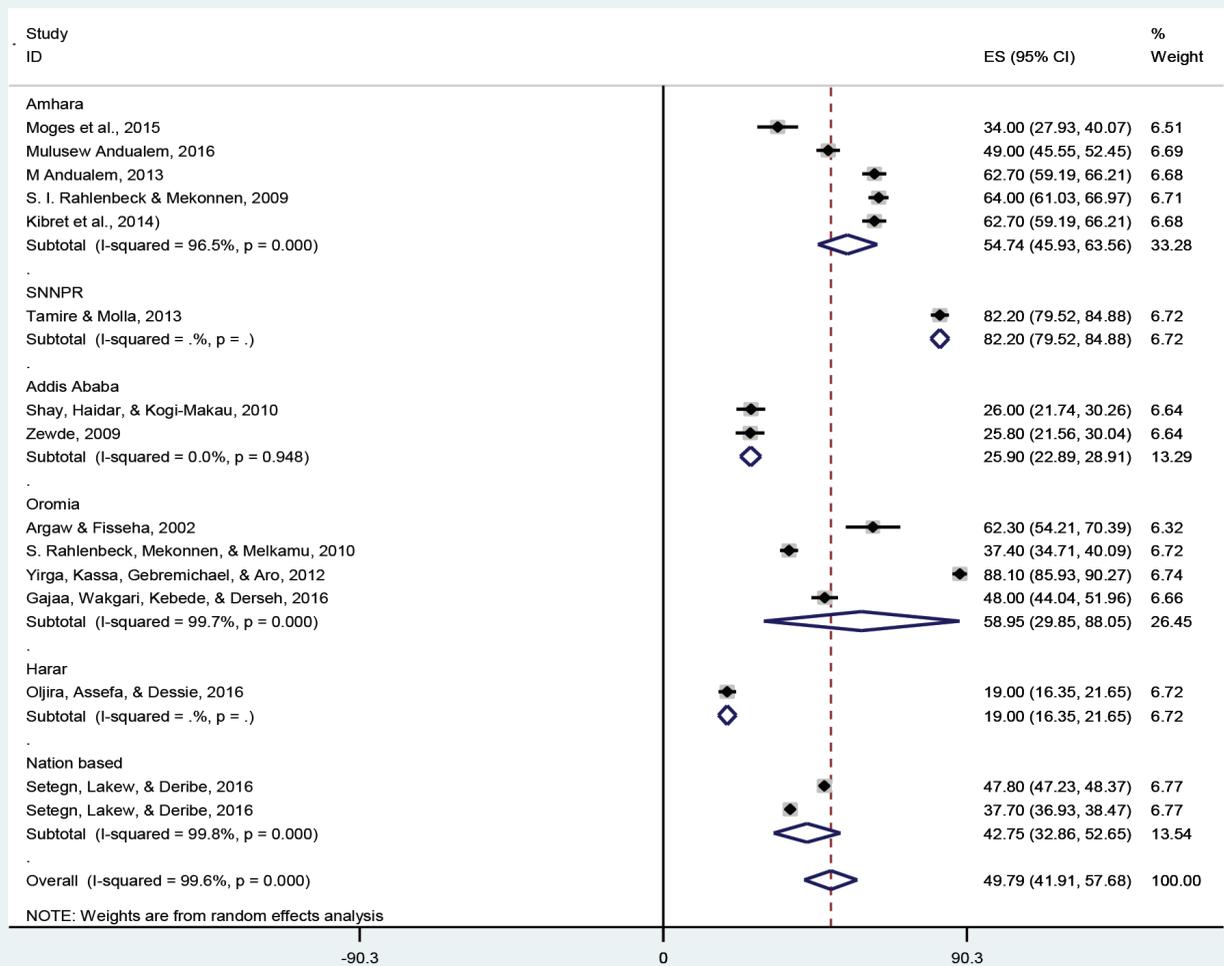


Figure 5: Variation in prevalence of female genital mutilation among children less 15 years old by region in Ethiopia, 2000-2014

## DISCUSSION

This review was conducted to estimate the prevalence of FGM among women and children less than 15 years and its regional variation in Ethiopia. The overall pooled prevalence of FGM among women in Ethiopia was found to be 84.6% (95% CI: 80.51%, 88.7%) and among children age less than 15 years was 49.79% (95% CI: 41.91%, 57.68%). These findings may suggest a decline in trend of FGM in Ethiopia. Moreover, the disparity or the lower prevalence of FGM among children as compared to women might be resulted from some women were unwilling to report their daughters were circumcised, since the practice is conserved

illegal. Additionally, the decline among girls might be partly explained by increased governmental and non-governmental sector commitment to halted the practice of FGM<sup>8</sup>.

In this meta-analysis the pooled prevalence of FGM in Ethiopia was high. However, the trends of the prevalence of FGM in Ethiopia has decreased over the past 16 years, reducing from 80% in the EDHS 2000 report<sup>54</sup> to 74% in the EDHS 2005 report<sup>55</sup>, and to 65% in the EDHS 2016 report<sup>8</sup>. The reduction is predominantly distinguished on younger children than women. This may due to FGM was criminalized in 2005, and this

may lead to under reporting of the practice to avoid legal consequences<sup>8</sup>. FGM depicts a public health concern and it has also subsequent infections and infertility problems associated with it.

This review also showed that FGM is widespread across Ethiopia with a varying degree. The practice of FGM among women is higher in Somali and Afar regions while the lowest prevalence was reported in Harari region. Regarding to the prevalence of FGM among children, the highest was observed in SNNPR followed by Oromia region, while the lowest was reported in Harari region followed by Addis Ababa. Thus, a significant disparity in the prevalence of FGM among regions might be resulted from the cultural difference within the country or reflect the variation of ethnicity. For instance, in Somali region, most of them were Muslim religion followers, they believed that if they are not circumcised, they feel that they are totally against their religion<sup>56</sup>. Moreover, FGM is deep-rooted in social beliefs within a frame of psycho-sexual reasons such as control of women's sexuality and family honor, which is highly enforced to practice by the community<sup>32, 57-59</sup>. Though, currently the practice is considered illegal, some of the communities have expressed their belief in its importance and their interest in its persistence of the practice<sup>58,60</sup>

The strength of this review and meta-analysis was identified the prevalence of FGM by categories (women vs children less than 15 years) and showed the regional variation of FGM in Ethiopia. However, our study didn't assess the factors associated with FGM and the pooled data analysis considered irrespective of the study year.

## CONCLUSION

The prevalence of FGM is high among women and children in Ethiopia. There is a wide variation of the FGM among women and children from region to region in Ethiopia. The highest prevalence of FGM among women was observed in Somali region followed by Afar region. FGM in Amhara region and Oromia region is nearly similar. On the other hand, the lowest prevalence was reported in Harari region. Regarding to FGM among children, the highest prevalence was observed in

SNNPR followed by Oromia region, whereas the lowest prevalence was observed in Harari region followed by Addis Ababa. Attentions should be emphasized to end or reduce the practice, mainly at the high FGM clustered regions of Ethiopia. Further large-scale studies and reviews should be done to identify the factors associated with FGM are recommended.

## LIST OF ABBREVIATIONS

CI: Confidence Interval  
CINAHL: Cumulative Index to Nursing and Allied Health Literature  
EDHS: Ethiopian Demographic and Health Survey  
FGM: Female Genital Mutilation  
HTTP: Harmful Traditional Practices  
JBI-MAStARI: Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument  
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses  
SD: Standard Deviation  
SE: Standard Error  
USAID: United States Agency for International Development  
WHO: World Health Organization

## DECLARATIONS

### Ethics approval and consent to participate

Not applicable

### Consent for publication

Not applicable

### Availability of data and material

All data pertaining to this study are contained and presented in this document.

### Competing of interest

The authors declare no competing of interest

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### Authors' contribution

AAM involved in the design, selection of articles, data extraction, statistical analysis and manuscript writing. AKB, GMK, and GAF also involved in data extraction, analysis and manuscript editing. All authors read and approved the final draft of the manuscript.

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### **CORRESPONDING AUTHOR**

Achenef Asmamaw Muche, MPH, MHSc  
Department of Epidemiology and Biostatistics, Institute  
of Public Health, University of Gondar, Gondar,  
Ethiopia  
E-mail: ashua2014@gmail.com

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