ORIGINAL ARTICLE:

A Five-Year Analysis of Histopathological Results of Cervical Biopsies Examined in a Pathology Department of a Teaching Hospital (2003-2007)

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Abstract

Background: Cervical biopsies are widely used for the diagnosis of various lesions of the cervix. Early diagnosis and treatment of benign and malignant cervical lesions are in turn associated with increased chance of long term survival.

Objectives: the aim of the study was to elucidate the pattern of cervical pathologies encountered at the Department of pathology, Addis Ababa University.

Methods: Retrospective review of biopsy request forms and reports examined at the Department of Pathology in Tikur Anbessa Specialized Teaching Hospital from 2003-2007

Results: The most common biopsy finding was cervical neoplasia (n=2312, 64%). Ninety four percent (n=2182of the cancers wee squamous cervical cancer (SCC), while to remaining were adenocarcinoma (n=104,4%) and adensoquamous (n=26,1.1%) carcinoma. Cervical intraepiothelidal neoplasia (CIN) was found in 8.6% (n=354) of the biopsies. The mean age of cervical cancers at diagnosis was 48years. Chronic cervicitis was the commonest benign lesion (n=698, 16.8%).

Conclusion: the majority of the diagnoses of cervical cancer were made late at the invasive stage of the disease process. Screening programs focused on early detection and treatments are recommended.

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Introduction

The crvix is both a sentinel for potentially serious upper genital tract infections and a target for viral and other carcinogens which may lead to invasive cancer. Infection constitutes one of the most common clinical complaints in gynecologic practice and frequently vexes both patient and clinician. The potential threat of cancer, however, is central to cervical cancer screening programs and histological interpretation of biopsy specimens by the pathologist. The relative ease of cervical examination allows observation of physiologic changes that occur in response to normal cyclic variations in ovarian hormone secretion, as well as a variety of structural abnormalities and pathologic conditions.

Cervical pathologies which can be diagnosed histopathologically include preinvasive and invasive cervical cancer, polyps, cervicitis, dysplasia, adenosis, leiomyoma, endometriosis and secondary's.

Cervical polyps commonly occur during the reproductive years, especially after age 40 years. The etiology is unknown. Chronic inflammation of the cervical canal may play a role, as may hormonal factors, since endometrial hyperplasis and polyps coexist more frequently than one would expect by chance alone. Histological, cervical polyps are characterized by vascular connective tissue stroma covered by epithelium, which may be columnar, squamous, or squamo columnar. Malignant change is rare.

In cervicitis, the inflammation primarily affects the columnar epithelial cells of the endocervical glands, but may also casue visible changes of the ectocervix, whose squamous epithelium is contiguous with that of the vagina.

Cervical intraepithelial neoplasia (CIN) refers to a preinvasive pathologica intermediate of cervical cancer that is slow to progress and can be easily detected and treated.

CIN is typically detected in younger women and many years before a diagnosis of invasive cervical carcinoma. The likelihood of progression increases and the time to progression decreases with increasing severity of CIN. As an example, the diagnosis of CIN is usually made in women in their twenties; carcinoma in situ is diagnosed in women 25 to 35 years of age, and invasive cancer after the age of 40, typically eight to 13 years after a diagnosis of CIN III.

Cervical cancer was the most common malignancy in both incidence and mortality among women prior to the 20th century.

Today, a dichotomy exists between developing and developed nations; the incidence of cervical cancer in the latter has fallen dramatically (1), while the disease continues to be the second most common cancer in women worldwide (2). The reduction in the incidence of cervical canceris one of the major public health achievements in developed nations, largely due to the implementation of population-based screening, detection, and treatment programs fro preinvasive disease.

Cervical cancer has different histopathologic types. Squamous cell carcinomas (SCC) account for 75-80% of cervical cancers, adenocarcinoma 15-25%, and adenosquamous carcinomas 3-5% (2). Adensoquamous tumors exhibit both glandular and squamous differentiation. They may be associated with a poorer outcome than pure SCCs or adenocarcinomas (3). In addition, neureoendocrine or small cell carcinomas can originate in the cervix in women, but are infrequent. Rhabdomyosarcoma of the cervix is rare; it occurs in adolescents and young women (14,15).

Adenocarcinomas have been rising in incidence since the 1970; especially in women younger than 35 years of age (8). Part of the increase may be attributable to an increasing prevalence of HPV infection and prevention of squamous intraepithelial neoplasia, thus leading to a histologic shift towards adenocarcinoma (14,15)

In Ethiopia there are limited studies on the subject. A previous report on biopsies indicated that cervical cancer was the most prevalent malignancy.

The main aim of this study is to elucidate the pattern of pathologic changes that are commonly responsible for cervical pathologies in our community and their association with socio demographic and clinical factors. It also aims to determine the prevalence of the different cervical pathologies, determine the prevalence of the different histlogic types of cervical cancer and assess possible sociodemographic and other factors associated with the histological types.

Materials and method

This is a retrospective cross-sectional study conducted at the department of Pathology, Tikur Anbessa specialized teaching hospital (TASTH), Addis Ababa University, by reviewing records of cervical biopsies examined from January 1,2003 December 31,2007.

The Department of pathology is one of the departments in TASTH and examines biopsy and cytology specimens from private and public health facilities from within and outside of Addis Ababa.

All records with histopathology diagnosis of cervical pathologies during the study period were identified and their biopsy 'request forms' and 'histology reports' were reviewed. All cervical punch biopsies were included in the study. Patient's age, duration of the complaint, presenting symptom, clinical diagnosis, number of punchy biopsy specimens per patient, histological findings.

Data was coded cleaned and entered to SPSS 15.0 statistical package. Mean, proportion and kappa correlation were used as appropriate.

Ethical clearance was obtained from the Department's Research and Publication Committee.

No information that might identify patient, treating physician and pathologist were collected.

Results

During the five years of the study (January 1, 2003- December 31, 2007), 40,872 biopsies were examined at the Department. Four thousand one hundred and fifty five (10.2%) biopsies were cervical punch biopsies. The punchy biopsies were mainly (n=3,380,81.6%) from the three teaching hospitals in Addis Ababa (TASTH, Gandhi and St. Paul's hospitals). Cervical biopsies from within and outside of Addis Ababa accounted for the remaining 18.4% of the biopsies.

The commonest presenting complaint was vaginal bleeding (n=2,978,75%) followed by vaginal discharge (539, 13.6%) pain (n=294, 7.4%) abnormal PAP (n=39, 1%), and other symptoms (n=111, 2.8%) were the remaining presenting complaints for the women who had punch biopsies. The other symptoms included abdominal distension, protruding mass per vagina, pelvic heaviness.

The mean age of patients with punch biopsies was 44.9 ranging from 13 to 92 years. 46.5% (n=1685) of the patients presented in < 6 months of onset of their symptoms, while 12.5% (n=452) of them had 2 years of illness.

The commonest indication for the punch biopsies was the clinical suspicion of cervical cancer (=3,693, 91.4%). Cervical polyp (n=148, 3.6%) and chronic cervicitis (n=77, 2%) were the remaining less common indications.

The average punches (specimens) taken per patients was. 3.7 and ranged from 1 to 8.67.8% of the patients had a 4 quadrant punch biopsy. The majority of the single punches (75%) were taken from patients with invasive cervical cancer and polyps.

On the other hand, four quadrant punch biopsies were taken in 65% of patient who had clinical appearance of normal cervix.

Invasive cervical malignancy was the most common histological finding (n=2318,55.7%) while cervical intraepithelial neoplasis (CIN) accounted for 8.6% (n=358) of the cervical biopsies. Benign cervical lesions and normal findings were found in 29.4% (n=1224) and 6.1% (n=255) of the biopsies, respectively. The benign lesions included chronic cervicitis (n=698, 16.8%) cervical polyp (n=272, 6.5%), and other legions such as cervical tuberculosis, condyloma, nabothian cyst, Metaplasia and koilocytosis (n=254, 6.1%) about 94% (n=2179) of the cervical malignancies were squamous cell carcinoma. There were 6 cases (0.1%) with embryonal rahabdomyosarcomas (Table 1).

Table 1: Proportions and mean age of patients with cervical cancer, Department of Pathology, Addis Ababa University, 2003-2008

Histologic type	No %	No (Mean age)
Squamous cell	2182(52.6)	2179 (48.3)
carcinoma	104(02.5)	104(48.4)
Adenocarcinoma	26 (00.6)	26(47.4)
Adenosquamous	698 (16.8)	694(40.3)
carcinoma	272 (06.5)	272(39.8)
Chronic	255 (06.1)	254(41.4)
cervicities	358(08.6)	354(42.4)
Cervical polyp	6(00.1)	6
Normal cervix		
CIN		(26.0)
Other cervical		
malignancies	254(06.1)	251 (39.8)

Other Total	4155(100)	4140 (44.9)

The mean age of the patients with squamous cell carcinoma was 48.3 while those with adenocarinoma and adenosquamous carcinoma had 48.4 and 47.5 years of age, respectively. The mean age of patients with benign lesions was generally less than 41 while patients with cervical malignancies had greater than 47 years of age. The mean age of patients with CIN (41.4 years) was slightly higher than the age of patients with malignant lesions (Table 1).

The prevalence of cervical had in increasing pattern with increasing age. The prevalence increased from 26.8% at of 20-3 to (81.8%) among women with cervical cancer than vaginal discharge (13.2%). (Table 2)

Table 2: Proportion was more common (81.8%)

And presenting symptoms Department of pathology, Addis Ababa University, 2003-2008

Histologic type	No %
Age groups in years	%
19 or less	30
20 to 29	26.8
30 to 39	42.2
40 to 49	52.4
50 to 59	71
60 or more	81.8
Symptoms	N(%)
Vaginal Bleeding	2027(81.6%)
Vaginal discharge	339(13.1%)

Clinical diagnosis and histological diagnosis of cervical cancer had rater agreement of 76% agreement by chance of 67% and kappa of 28%.

Discussion

The cervix is the single most commonly biopsied structure because it is both a site for potentially serious upper genital tract infections and viral and other carcinogens. At the same time. The cervix is easily accessible for examination and biopsy. In this study, cervical punch biopsies accounted for 10.2% of all the biopsies submitted to the Department. More than 80% of the biopsies were from the three teaching hospitals.

As these hospitals were referral and teaching hospitals. As expected, the number of punch biopsies among patients with invasive cervical legions was less than those with benign lesion The number of punch biopsies was higher among patients with benign legions or no obvious clinical diagnosis because colposcopy directed or alternative tests were rarely available to direct sampling at potential legions.

The mean age of cervical cancer in this study was 48 years which is similar to the 47 years in the USA 1, 5, 16l. Recent studies indicate that the proportion of adenocarcinoma has increased from 5% to 15-24% of the invasive cervical cancers l4, 14, 15]. The proportion of ade nocarcinoma in this study was not high accounting for about 4% of the invasive cervical cancers. The differences partly can be attributable to the lack of effective cervical cancer screening programs in our country

The mean age of CIN stands at 41.4yrs in our study which is higher than the western figure of the third decade. This is highly likely to be due to lack of screening and detection at asymptomatic stage. Most of our patients come with clinical symptoms.

It is known that adenosquamous cancers are associated with poorer prognoses than pure squamous or adenocarcinomas. Its proportion was lower ies(3-5% of cervical cancers at 35 years) 17, 8, 14, 15].

The low proportion (1%) of punch biopsy requests following abnormal Pap smear was due to the lack of organized and widely available screening program in the country. The high proportion of invasive carcinoma and late presentation of patients indicates the need to investigate the delay factors and implement early diagnosis and cost-effective treatment programs. Initiation of effective cervical screening programs is mandatory to preventable mortalities and morbidities associated with the cervical cancer.

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ORIGINAL ARTICLE:

ASSESSMENT OF THE STATUS OF PMTCT SERVICES IN PRIVATE FOR-PROFIT HEALTH INSTITUTIONS IN ETHIOPIA

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Abstract

Background: Private health institutions are rapidly expanding in our country, making significant contributions to improve access to health care, particularly to the urban population. Provision of comprehensive PMTCT services by the sector is one potential and crucial area in the fight against HIV/AIDS. However, the involvement of the sector in the national PMTCT program in negligible.

Objective: to assess the status of PMTCT service provision in private for-profit maternal and child health (MCH) special clinics, MCH hospitals and general hospitals in Ethiopia.

Methods: A descriptive cross-sectional study was conducted from February to March 2008 in private health institutions in all regions and two city administrations of Ethiopia.

Result: A total of 40 eligible health institutions were visited with a response rate of 97.5% Most facilities, 27 (69%.2%), were located in Addis Ababa, None of the facilities were providing comprehensive PMTCT service package of the 172 service providers directly involved in at least one of the reproductive health care services in the target facilities, none were providing a complete package of the PMTCT services to their clients and only 64(37.2%) of them had ever taken in service training on PMTCT. All institution, however, were willing to participate in future efforts and activates to initiate or improve the PMTCT services according to the national guideline.

Conclusion and recommendations: the findings reflect the huge missed opportunity in addressing PMTCT service needs among the increasing number of women visiting private health facilities. It could have been also a good entry point to reach not only pregnant women who come for antenatal follow up but other family members who are in need of HIV/AIDS care/services also. There is high need and strong commitment for providing PMTCT services in the private health institutions. Immediate action, by all concerned governmental nongovernmental stake holders, should be taken to work together and meet the badly needed support if we are to achieve the national shared vision.

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Introduction

Ethiopia is one of the countries that are most severely affected by the HIV/AIDS pandemic. According to the 2008 calibrated single point estimates 1,037,267 Ethiopians are living with HIV/AIDS anticipated during the year (1). The most significant source of HIV infection in children and infants is transmission of HIV from mother to child during pregnancy, labor and delivery, or breastfeeding (2-5). According to UNICEF; in the absence of preventive measures the risk of a baby acquiring the virus from an infect mother ranges from 15-25 percent in industrialized countries (3). Prevention of there to child transmission (PMTCT) of HIV is one of the most important intervention strategies in preventing new infections and in providing the services needed to ease the burden on HIV in faceted women. Effective comprehensive PMTCT services have been shown to decrease this rate to less than 2% (6-8) therefore PMTCT must be held as one of the priorities in the collaborative effort against the HIV/ADIS pandemic and to save our future generation.

In most developing countries, all the health needs of the population cannot be addressed by the government alone and as a result there is a big gap between the public's demand and service delivery. One increasingly important sector in filling this gap is the private for profit health sector. In Uganda, for example, 46 percent of the estimated 4,639 health facilities in 2005 were private for profit (9). In Ethiopia as well the private sector is rapidly expanding in recent years making significant contributions to improve access to health care particularly to the urban populations.

According to the national health indicators (199 Ethiopian Calendar (EC)) report, nationwide there were 1756 private health institutions including 31 private hospitals, 161 private higher clinics and 111 private special clinics.

In Addis Ababa alone, there were 22 private hospitals, 5 special maternity clinics and 932 higher clinics (10). In addition, out of a total of 1806 physicians registered in the country, 788 (43.6%) were practicing in the private health sectors. Nationwide there were 58 (50.8% of the total in the

country) Gynecologists, 50 (66.7%) pediatricians, 254 (30.5%) general practitioners, 53 (5.2%) midwives and 448 general nurses practicing in the sector (10).

One of the important public health problems that mandate the active participation of the private health sector is the fight against HIV/AIDS pandemic. PMTCT is one of the crucial interventions to help win this deadly fight. PMTCT plays a central role by preventing new infections and by providing the services needed to ease the burden on HIV infected women. World health Organization (WHO) promotes a comprehensive strategic approach to the prevention of HIV infection in infants and young children (3).

A comprehensive PMTCT is the prevention of transmission of HIV from mother to child by routine offering of HIV counseling and testing, safe and quality obstetrical services, provision of HIV care/anti-retroviral therapy (ART) for mothers and infants, infant feeding counseling, family planning (FP) counseling and functional referral linkage (1-4) with these interventions the risk of mother to child transmission (MTCT) can be reduced to under 2% and new HIV infections in children are becoming in caressingly rare in many parts of the world, particularly in high income countries.

To implement these effective intervention strategies in our set up the Federal Ministry of Health (FMOH) has developed a PMTCT management guideline and is expanding and is expanding the service in governmental health facilities all over the country.
According to the Annual HIV/AIDS Monitoring and evaluation 2nd report 1999 E.C. (2006/07) of the National HIV/AIDS prevention and control office (HAPCO); the number of PMTCT sites in the country increased from 4 in 1994 EC to 408 sites (public hospitals and health centers) in 1999 EC health and health related indicators report of FMOH has indicated that only 38.2% of health facilities in the country supposed to deliver PMTCT care were actually providing the service,. This showed that actually providing the service. This showed that much had to be done to further expand the service in both public and private facilities in the country:

Although the private health institutions and their health professionals are providing obstetric and neonatal care for a significant proportion of the population, there were no studies done to evaluate

the situation related to PMTCT services in these facilities. This survey was intended to assess the status of the existing practice and service delivery set up in private health institutions for PMTCT services; and to describe the profile of the health professionals practicing in these institutions.

It is expected to identify gaps from the recommended practice, assess technical support needs (e.g. training needs,) and measure personal and institutional commitments. The results of the survey will help in devising effective training and technical support to the sector to enable them implement the national PMTCT strategies and contribute their crucial share in the fight against HIV/AIDS.

The survey was sponsored by the United States Centers for Disease Control and Prevention (CDC) in accordance with the Ethiopian public Health Association (EPHA) – CDC Cooperative Agreement No. 5U22/PSO22179-05) the content of the survey are solely the responsibility of the authors and do not necessarily represent the official views of CDC.

Methodology

This is a cross-sectional descriptive study conducted on private for profit health institutions in all region and two city administration of Ethiopia. It was conducted from February to March 2008. The study population was: all private hospitals and special maternal and child health (MCH) clinics in Ethiopia, which are providing antenatal care, delivery, postpartum and other reproductive health (RH) care services and all health professionals practicing in these facilities.

Data was collected using a structured pretested questionnaire prepared in English. Ethical clearance was obtained from the Ethiopia Society of Obstetricians & Gynecologists (ESOG), public health research review committee of EPHA and ethical committee of Addis Ababa Regional health Burea (AARHB). The data was collected by midwives and supervised by obstetricians/gynecologists. Training was give on the questionnaires and the data collection process. Letter of support from ESOG was taken to the regional health bureaus; which subsequently wrote letters of cooperation to the private health institutions.

Data was collected by interviewing the facility owners/heads and health care providers and assessing the service delivery setup for PMTCT of the facilities using a structured pre-tested questionnaire and an observation checklist respectively prepared in English.

Confidentiality was assured and informed verbal consent was obtained from each health institution and study subjects. The questionnaires were coded after completeness was checked; then the data were entered and analyzed using SPSS version 13.0 software program.

Results

Of the 40 eligible private health institutions in the country, 39 consented to participate in the study, which is a response rate of 97.5%.

Table 1: Distribution of the health facilities by region, April 2008

Regions	Number	Percent
Addis Ababa	27	69.3
Tigray	2	5.1
Amhara	2	5.1
Oromia	2	5.1
SNNPR	2	5.1
Dire Dawa	2	5.1
Harari	1	2.6
Somali	1	2.6
Total	39	100

Twenty-six (66.7%) of the studied health facilities were general hospitals while 7(17.9%) were maternity hospitals and 6(15.4%) were special maternity clinics (Table 2). In this study, there were 10,641 clients seen for antenatal care (ANC) monthly.

Table 2: Distribution of health establishments by their type, April 2008

Type of health establishment	Number	Percent
General Hospital	26	66.7
Special maternity hospital	7	17.9
Special maternity clinic	6	15.4
Total	39	100

At least one of the HIV/AIDS care services was provided in 33(84.6%) of the study health institutions. ART service was provided in 15(38.5%) and management of opportunistic infections in 29(74.4%) of the study facilities. At least one of the PMTCT services was provided in 20(54.1%) of the facilities. When looking at all the patient population, voluntary counseling and testing (VCT) service was provided in 33(84.6%), routine HIV counseling and testing (HCT) was Offered in 18(46.1%) for ANC clients, in 13(33.3%) during labor and delivery and in 12(30.8%) for postpartum clients (Table 3). ARV prophylaxis for the mother was given in 15 (40.5%) and for the newborn 10(27%) of the institutions. Infant feeding counseling was given in 17(85%) and family planning counseling in 19(95%) of the institutions with PMTCT services.
Majority of the facilities, 27(69.2%), were in Addis Ababa (Table 1).

The median number of new clients who visited each health facility of ANC per month was 99. Labor and delivery services were provided for a total of 913 clients per month.

The PMTCT service they provide was considered adequate by 2(10%) of the institutions' heads. Unavailability of ARV drugs were the reason for not providing PMTCT services for 22(56.4%). No trained staff for 17(43.6%), not permitted to provide the service for 9(23.1%) and no VCT service for 7(17.9%) of the facilities.

The support they get from the government in implementing PMTCT service was rated as very good 2(5.4%), satisfactory 4(10.8%), unsatisfactory 5(13.5%), non-existent 19(51.4%) and

7(18.9%) of them gave no response. Only 7(18.9%) of the institutions claimed that they ever received technical assistance from nongovernmental organizations (NGOs) for implementation of PMTCT services (fig.1).

Fig.1: Support from government in implementing PMTCT services in private for profit health sector

Majority of the facilities (36/39) are willing to strengthen or initiate PMTCT services if provided support in their problem areas. The assistance needed are infection prevention materials for 34(87.2%), staff training for 33(84.6%), ARV drugs for 33(84.6%) and HIV test kit supplement for 32(82.1%). Most of the institutions (36/39) were willing to send their staffs if invited for relevant trainings on PMTCT. Short age of staff and lack of interest in providing the service were reasons for two facilities for not willing to participate in the trainings.

Infrastructure: the infrastructure of the institutions was observed. It was revealed that counseling room with doors and windows to ensure auditory and visual privacy was available in 31 (83.8%) and separate room for counseling in labor and delivery ward in 18(48.6%) of the institutions. Internet access was found in 27(73%) of the health facilities. in all of the institutions running water and electricity supply were available. All except two health institutions had functional labor and delivery unit. Only one of the study facilities didn't have functional laboratory.

Logistics and Supplies: HIV test kits were available in 27(73%). Nevirapine syrup and nevirapine tablets were available in 10(27%) and 15(405%) facilities, respectively. Majority of the institutions (31/39) had goggles and plastic apron. Plastic boot was found in 24(64.9%) of the institutions and puncture proof sharp disposal containers in 25(67.6%). Lockable storage space for PMTCT ARVs in labor and delivery ward was available in only 12(32.4%) of the institutions. Reporting format was found in 24(64.9%) and a mechanism for documenting exposed infants was available in only 8(21.6%) of the institutions. PMTCT laboratory log book was seen in 5(13.5%) health institutions PMTCT cue card and PMTCT guideline were found in 3(8.1%) and 7(18.9%) of health facilities, respectively. PMTCT drug dosage wall chart was seen in 7(18.9%) client education materials were available in 8(21.6%) of health institutions. Seventeen (45.9%) of the health institutions had been supervised by responsible authorities once a year while 10(27%) of the institutions were supervised twice per year.

Table 3: Proportion of facilities which provide routine HCT by category/type of clients.

Category/type of clients	Number (Total=39)	Percent (%)
ANC clients	18	46.1
During labor and delivery	13	33.3
Postpartum clients	12	30.8
Clients who come for neonatal care	12	30.8
Clients coming for STI manage ment	14	35.9
Family planning clients	12	30.8
Post abortion car.	12	30.8

Functional referral linkage was available in 17(45.9%) of the health institution. None of the facilities were providing a comprehensive PMTCT service package. Standard PMTCT ARV drug regiment according to the national PMTCT guideline was offered in 7(17.9%) of the health institutions. Referral for ART after completing staging was practiced in 4(10.2%)

While 7(17.9%) facilities practice immediate referral to ART clinic after confirming sero status. An exposed infant follow up was found in 8(20.5%) of the service sites. PMTCT focal person was available only in 6(15.4%)of the health institutions while PMTCT data manager was assigned in 3(7.7%) of the institutions Table-4

Available type of HIV/AIDS service	Number (n=39)	Percent
At least one of the services		
Yes	33	84.6
No	6	15.4
VCT		
Yes	33	84.6
No	6	15.4
ART		
Yes	15	38.5
No	24	61.5
At least one of the PMTCT service		
Yes	20	51.3
No	19	48.7
Exposed infant follow up		
Yes	8	20.5
No	31	79.5
PMTCT focal person		
Available	6	15.4
Not Available	33	84.6
PMTCT data manager		
Available	3	7.7
Not available	36	92.3

There forth of the supervised institution took the supervision as supportive. Client suggestion box to assess client's opinion was available in 25(67.6%) whereas staff suggestion box was available in only 5(13.5%) of health facilities.

Status of practice on PMTCT services of health professional in the target health institutions:

A total of 172 health care providers of which 101(58.7%) were females who were directly involved in at least one of the RH care services in the study sites were interviewed.
Of these 35(20.3%) were gynecologists and 47(27.3%) midwifes (Table 5). More than two third of the interviewed providers were practicing in hospitals while the remaining 31(18%) were working at special maternity clinics. The majority (119/172) of the providers were working in Addis Ababa.

There median service year of the health care providers was 11 years while the median MCH service provision was 7 years. Two third of the service providers replied that they provided at least one of the HIV/AIDS care services to their clients.

Table 5: Distribution of the respondents by profession and sex, April 2008

Respondents	Number	Percent
Profession (n=172)		
Registered nurses	52	30.2
Midwifes	47	27.3
Gynecologists	35	20.3
Pediatricians	17	9.9
General practitioners	8	4.7
Other	13	7.6
Sex		
Female	101	58.7
Male	71	41.3

Out of these 92(71.3%) had less than five years of work experience in providing HIV/AIDS services. Eighty-two (49.7%) replied that they provided the service in the same institution, 66(40%) in governmental health institution and 17(10.3%) at one of the NGOs. None of the health providers were providing a complete package of the PMTCT services to their clients while only 80(46.5%) had ever provided at least one of the services.

Most service providers (92/172) were not able to provide any of the service for those clients who were in need. Of those who had experience in providing PMTCT service, 31(38.6%) were with experience above 12 months. The majority (111/172) of the respondents had ever received in-service training in HIV/AIDS care, prevention or treatment. Only 64(37.2%) of them replied they had ever taken in-service training on PMTCT care (Table 6).

Table 6: Distribution Health Professional with the service provision and training status, April 2008

Provider response (n=172)	Number	Percent
Provided HIV/AIDS services		
Yes	129	75
No	43	25
Provided PMTCT services		
Yes	80	46.5
No	92	53.5
Received in-service training on		
HIV/AIDS	111	64.5
Yes	61	35.5
No		
Received in-service training on	64	37.2
PMTCT	108	62.8
Yes		
No	59	34.3
Received training on VCT	113	65.7
Yes		
No		
Received training on VCT	58	33.7
Yes	114	66.3
No		

It was seen that there were 29 health care providers who were not formally trained on PMTCT but involved in giving the service (Table 7).

Almost all the interviewed health providers (170/172) expressed their willingness to participate in PMTCT training and be involved actively in providing the service.

Table 7: Distribution of health workers by their training status and PMTCT service provision, April

Provide PMTCT services			
Received in- service training on PMTCT:	Yes	No	Total
No	51	13	64
Yes	29	79	108
Total	80	92	172

Discussion

The most significant source of HIV infection in children and infants is transmission of HIV from mother-to-child during pregnancy, labor and delivery, or breastfeeding. According to UNICEF, in the absence of preventive measures, the risk of a baby acquiring the virus from an infected mother ranges from 15-25 percent in industrialized countries and 25-35 percent or higher in developing countries (2). Obviously, in the collaborative effort against the HIV/AIDS pandemic and to save our future generation, PMTCT plays a central role by preventing new infections and providing the services needed to ease the burden on HIV infected women.

Private health facilities serve a significant number of women who present for RH services. The share of the facilities health service delivery and coverage is obviously increasing from time to time. One major group of clients for the sector are women coming for different RH services/care which could be a good entry point for a comprehensive PMTCT services provision contributing significantly to the nation's effort in controlling the HIV/AIDS pandemic. Along with the growing number of facilities, the number of health providers in the sector increases.

The high facility response rate (97.5%) makes the findings of the survey to be very representative of the real scenario in the private health institutions of the survey to be very representative of the real scenario in the private health institutions of all eligible facilities. There were, however, no similar studies done nationally to compare the results of this study. The availability and quality of PMTCT services in the study facilities was discouraging.

There was no single target institution which was providing a complete package of PMTCT services in line with the national strategies for reasons beyond their control. In a study done in Uganda in 2005,12 percent of PHP facilities provide PMTCT and only 2 percent offer ART services, which is an opposite scenario as compared to the situation in Ethiopia (9). The service delivery set up for PMTCT was also poor. The majority of the health institutions didn't have basic equipment and supplies for PMTCT service provision. Only 5.4% of the institutions rated the support they get from the governmental bodies in implementing PMTCT service as 'good' while only 18.9% reported to have ever received technical assistance from NGOs. This finding should alert concerned bodies to contribute their assistance for strengthening these sites.

HCT has been shown to have a crucial role in HIV prevention and serve as an entry point to care for people with HIV infection including PMTCT. It greatly influences the acceptance and use of PMTCT services (11, 12). However; the routine offering of HCT during ANC and intra-partum care (46% and 33%, respectively) was low in the sector with obvious consequences expected. IEC materials which are important source of information for the clients and their families were not available adequately in the study institutions.

This study also tried to examine practice of health professional on PMTCT service provision private at private for-profit healthy institutions in Ethiopia.

Effective and comprehensive PMTCT service delivery requires training of actively involved health providers on up-to-date intervention strategies and proper organization of the facilities. According to the study, however, majority of the health providers in the study have never received in-service training on PMTCT of HIV.

It was observed that none of the health providers were providing a complete package of the PMTCT services to their clients; while only 80(46.5%) had ever provided at least one

This reflects the huge missed opportunity not only to address the PMTCT service needs of an increasing number of women served in the facilities but also the good entry point to reach the family members HIV/AIDS care/service needs. In addition, there were 29 service providers who were actively involved in the provision of PMTCT services without having in service training which could lead to inappropriate or substandard care and ultimately failure to achieve the required target.

Inadequate supervision by responsible authorities was noted as an area of weakness. A strong supportive supervision system should be implemented to ensure quality of care. It was, however, encouraging to discover that all the interviewed institutions and health care providers were willing and committed to participate in future efforts to improve the PMTCT services in their institutions according to the national guideline.
Almost all facilities were ready to facilitate for their staff to attend if relevant trainings are arranged.

Considering the non-practice of comprehensive PMTCT service delivery, the high training demand and the strong commitment to be involved in the national fight against HIV/AIDS; it is recommended to initiate a comprehensive program to address the provider's needs, fill the gaps and to standardize their service delivery set up for PMTCT.

This calls for immediate action by all concerned governmental and nongovernmental stake holders to work together to meet the support they badly need and reverse this tragic scenario if we have to achieve the national shared vision. For a better assessment and devising sustainable implementation strategies further study involving the clients is recommended.

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ORIGINAL ARTICLE:

BIRTH TO PREGNANCY INTERVAL AND ITS EFFECT ON PERINATAL OUTCOMES IN ADDIS ABABA, ETHIOPIA

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Abstract

Background: Study findings on inter pregnancy interval and its effect on birth outcome looks contradictory. Some report that it is a risk factor for adverse perinatal outcome while others say it has no association. Still, there is no universally agreed recommendation on the ideal inter-pregnancy interval with regards to favorable perinatal outcome.

Objective: to assess birth to pregnancy interval and its effect on perinatal outcomes in Addis Ababa, Ethiopia.

Methods: A Cross sectional study was undertaken on a sample of 1339 mother who gave birth at a randomly selected public and private health facilities located in Addis Ababa, Ethiopia. Eligible mothers from selected health facilities were consecutively included in the study until the required sample was achieved. Data was collected using a structured questionnaire and appropriate measurements. Data was processed and analyzed using EPI info and SPSS computer software. Univariate and bivariate analysis were employed.

Result: the rate of preterm, low birth weight (LBW) and stillbirth were 7.1%, 5.6% and 3.1%, respectively. The mean birth to pregnancy interval was 45.9+27.3 months (95% Confidence Interval (CI) 44.4, 47.3). Birth pregnancy interval has shown no effect on poor perinatal outcome.

Conclusion: Further Studies on the effect of birth to pregnancy interval on perinatal outcomes is recommended

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Introduction

Perinatal mortality is an indicator of poor obstetric care. It is generally influenced by prenatal, intrapartal and neonatal care. The most common fetal conditions that lead to perinatal death include congenital anomalies, intra uterine growth restriction (IUGR) and sepsis (1). Early neonatal death, which attributes to most perinatal deaths, is caused by preterm birth and low birth weight (2). Stillbirth accounts for 74% of all perinatal deaths (1). Worldwide, it is estimated that, 7.6 million perinatal deaths occur annually, of which 98% take place in developing countries (3). In Ethiopia, a community-based study conducted to see the risk factor for outcome of prolonged labor in rural Ethiopian women giving birth at home showed a perinatal mortality of 45/1000 births (4).

The birth weight of an infant is the single most important determinant of newborn survival; neonatal illness in general is closely related to low birth weight. More than 20 million infants worldwide, (representing 15.5 percent of all births) are born with low birth weight (LBW). Some epidemiological observations revealed that infants born under weight (less than 2500 gram) are approximately 20 times more likely to die than heavier babies 95). In Ethiopia; studies showed that the prevalence of low birth weight varies from 6-10% (6), another retrospective study conducted to establish birth weight changes at Tikur Anbessa hospital showed that low birth weight has increased trend between 1976 and 1996 (7).

According to the 2005/06 annual activity report of Addis Ababa City Administration Health Bureau; the rate of low birth weight among all deliveries attended from health institutions reporting to the city health bureau is 11% (8). In another paper, more than 60% of all low birth weights were preterm. Some are both premature and growth retarded while others may be full term but under weight (small for gestational age) (9)

Preterm birth is the single most common causes of perinatal mortality in Europe and North America (10).

In Ethiopia, study done at Tikur Anbessa Hospital showed that preterm birth has increased from 5.5% to 8.7% between 1980s and 1990s (7). Stillbirth rate is an important indicator of access to and quality of antenatal and delivery care. Stillbirth prevalence at community level is typically less than 1% in more developed parts and could exceed 3% in less developed regions. [(11)] Some research

revealed that, globally, there are 3.2 million (2.5 -4.1 million) stillbirths per year. The rate in Sub-Shara Africa is 32 per 1000 births (12). In Ethiopia a study reported that the prevalence of stillbirth 19/1000 births (4.) A study done at Tikur Anbessa Hospital has shown a stillbirth rate of 5.3/1000 births and contributed to 77.2% of gross perinatal mortality (13). The Ethiopian Demographic and health survey (DHS) 2005 data indicated that the still birth rate is 1.8% (14). The Addis Ababa city administration health bureau 2005/06 annual activity report revealed that the rate of stillbirth is 2.5%. (10).

Though, the time priod (risk period) of inter pregnancy interval to adverse perinatal outcome is not specifically isolated and suggested yet, different studies showed that inter pregnancy interval is one of the determinant factors for preterm birth, low birth weight, small for gestational age births and stillbirth (15,16).

According to DHS 200, in Ethiopia; the overall median birth interval is months, 20% of non-first births occur less than 24 months after the preceding birth with 8% occurring in less than 18 months, about 43% of women give birth at least 36 months, after the previous birth and pregnancies that occur at less than a 15month interval are having a more than three times perinatal mortality risk than those pregnancies occurring after long intervals. (17)

One study done at Tikur Anbessa and St. Paul's hospital on the impact of spacing on outcomes of pregnancy has shown that conceiving within 12 monthof previous delivery isw a critical interval to cause low birth weight baby. Short inter pregnancy interval together with other socio demographic factors is responsible for unfavorable birth outcomes (18).

The study done at Tikur Anbessa and St. Paul's hospital was the only study that has been conducted in Ethiopia to see any association between inter-pregnancy interval and perinatal outcomes. The aim of this study therefore is to assess birth to pregnancy interval and its effect on perinatal outcome in Addis Ababa, Ethiopia.

Subjects and Methods

A cross sectional study was conducted on mothers who delivered at selected health facilities from Addis Ababa. Addis Ababa has an estimated population of 2.9 million. The town is divided into ten sub cities and hundred *Kebele* administrations. There are 12

hospitals, 29 health centers, 130 clinics, 43 health stations and 382 private health facilities, with potential health service coverage of 143%. (26) health care facilities that give delivery service in Addis Ababa includes; five public hospitals, three military hospitals; 21 public health centers and 32 private health facilities. In 2006, 31,952 deliveries were attended.

Health institutions were stratified into public hospitals, public health centers and private health institutions. Three hospitals, ten health centers and ten private clinics were selected using simple random sampling method. The number of subject selected from each stratum was determined according to the proportion of the service they render. We enrolled all consecutive laboring mothers coming to health facilities to give births, who had at least one live birth preceding the current pregnancy and with no history of abortion in between.

Data was collected from December 1st 2006 to April 28/2007. Primary data was retrieved by interviewing study participants' birth weight of the newborns was measured using a baby weighing scale graded in grams, taken within ten mutes after delivery, naked and before taking anything per mouth. Birth to pregnancy interval was calculated by counting the time period from the start of the index pregnancy (as evidenced by last menstrual period) and the date of the preceding live birth calculated to the nearest month. Weight for gestational age was computed by using standards of Lubchenco curve (27). Data was entered, cleaned and analyzed using EPI 6 and SPSS 11.0 computer software programs.

Association of socio demographic, past medical and obstetric history and current pregnancy out comes and birth to pregnancy intervals was determined by cross tabulating, chi square test and odds ratio (OR) with 95% confidence intervals. Multiple logistic regressions were used to control for confounders.

Ethical approval was obtained from research and publication Committee of Addis Ababa University Medical Faculty. Permission was obtained from head of study facilities and verbal consent was obtained from study participants.

Result

A total of 1339 mothers, 432(32.3%) from public hospitals, 559(41.2%) public health centers and 348(26%) private health institutions were interviewed. Five hundred eighty-two (43.5%) were in the age group of

25-29 and 12(0.9%) were below the age of twenty years.

The mean age was 28+4.5, ranging from 17 to 41 years. 291(21.7%) were illiterate, 431(32.4%) had elementary school education, 461(34.6%) secondary and 148(11.1%) tertiary education. Among the study participants, 890(66.5%), 265(19.8%) and 172(12.8%) were Orthodox Christians, Muslims and protestants, respectively. Majority of mothers 1282(96.1%) were married and housewives 948(70.8%).

There were 86(8.4%) mothers who had a birth interval of less than 12 months and 316(23.9%) had birth to pregnancy interval less than 24 months. However, 277(20.7%) has greater than 72 months and 388(29.2%) has greater than 60 months birth to pregnancy interval.

The average birth to pregnancy interval was 45.9+27.3 months with 95% CI (44.4, 47.3). the median birth interval was 40 months ranging from two months to 99 months.

Fig 1- Bar graph showing the distribution of birth to pregnancy intervals among study subjects in Addis Ababa health institutions, Dec to April 2007

Forty-three (3.2%) mother coming for delivery report that they have chronic medical problem diabetes constitutes 13(32.5%) hypertension 12 (27.9%), cardiac disease 4(9.3%) and tuberculosis 3(6.9%).

Nine mothers have reported history of smoking cigarette, there still smoking. The duration of smoking was less than one year, ranging from 1-8 cigarettes per day. The gap between stopping smoking and pregnancy, among those who stopped smoking ranges from one year to 12 years.

Pregnancy complication to the index pregnancy has happened in 103(7.8%) of the cases, the leading cause of pregnancy complication wee ante partum hemorrhage (APH) 31(27.7%) followed by pregnancy induced hypertension (PIH) 28(25%) and hyperemesis gravidarum 20(17.9%).

Table 1- Current pregnancy complication and preceding birth outcomes of in women who gave birth for second time in Addis Abba health institutions from Dec to Arpil 2007

Characteristics (N=1339)	No. (%)
Does the current pregnancy have complications?	
Yes	103(7.8%)
No	1225(92.2%)
Unknown	11(0.8%)
Types of complications	
APH	31(27.7%)
Poly hydraminos	11(9.8%)
Cervical incompetence	2(1.8)
PIH	28(25%)
PROM	14(12.5%)
Hyper emesis	20(17.9%)
Preceding birth outcome	
Preterm birth	14(1%)
Cesarean section	122(9.1%)
PPH	19(1.4%)
SVD	1217(90.9%)
Preceding Birht/child/sex	
Male	712(53.2%)
Female	620(46.3%)
No response	7(0.5%)
Use of contraceptive in current pregnancy	
Yes	861(64.3%)
No	478(35.7%)

Table 1 shows that, among all deliveries at tended 171(12.8%) had experienced complications out of which 62.6% were managed in hospitals, the leading 64(37.4%) cause of labor Complication was prolonged labor followed by mal position/mal presentation 45(26.3%), neonatal asphyxia 26(15.2%) and obstructed labor17(9.9%)

Table 2- Current pregnancy complication and preceding birth outcomes of in women who gave birth for second time in Addis Abba health institutions from Dec to Arpil 2007

Characteristics (N=1339)	No.(%)
RH type	
Positive	1218(91.9%)
Negative	51(38.%)
Unknown	70(5.2%)
Complications of labor	
Yes	171(12.8%)
No	1168(87.2%)
Methods of delivery	
Vaginal	1050(78.4%)
Cesarean section	218(16.3%)
Instrumental	10(0.7%)
Augmentation or Induction	3(17.9%)
No response	
Is the neonate born alive?	
Yes	1294(96.6%)
No	42(3.1%)
No response	3(0.2%)
Birth weight	
Low birth weight	94(7.2%)
Normal birth weight	1212(90.3%)
Un known	33(2.5%)
Gestational age	
Pre Term	93(7%)
Term	1165(86.9%)
Post Term	75(5.6%)

Un known	6(0.4%)
Sex of new born (N=1339)	
Male	667(49.8%)
Female	638(47.6%)
No response	34(2.5%)

Deliveries that are completed spontaneously with vaginal delivery were 1050(78.6%) and 218(16.3%) delivered by cesarean section. Majority, 1294(96.6%) of the neonates were born alive and 42(3.1%) were still born. The mean birth weight was 3172+515 grams with 95% Ci (3144,3200). The rate of low birth weight was 7.2%. 109(8.4%) of the neonates were small for gestational age. Nine (0.7%) neonates were born with different types of congenital malformations like club foot, anencephaly, cleft plate and four were born as stillbirths. The preterm and posterm birth rates were 7% and 5.6 %, respectively. The mean gestational age was 39.2+2.1 months with 95% CI (39.1, 39.3). The male to female ratio of the current birth was 1.05.

Factors associate with pre-term birth

Preterm birth occurred in 7.1% of the cases. Motehrs of the age group >35 has the highes proportion 18(11%) of preterm delivery, mothers who are unable to read and write had highest rate 26(9%) of preterm delivery. Deliveries that happened following contraceptive failure have high preterm birth 9(11%). But all these variations are not statistically significant. Deliveries from mothers who have PIH and APH had highest preterm birth (21.4% and 29%, respectively). The presence of any form of pregnancy complication to current pregnancy with OR 3.1 and 95% CI = (1.8, 6.2) has a statistically significant association to preterm birth.

Mothers who had postpartum hemorrhage (PPH) in the preceding delivery were shown to have high preterm birth rate 4(21%). Mothers who have known chronic medical problems; diabetes mellitus (DM), hypertension and cardiac disease showed to have high preterm birth (14-25%).

Cigarette smoking showed association with preterm birth (10-11%). However, no statistically significant association was observed between birth to pregnancy interval and preterm birth.

Table 3- Past obstetrics history and Birth to pregnancy intervals Characteristics of pre-term birth in Women who give birth for two or more times in Addis Ababa health institutions from Dec to April 2007

Variables	Yes N=94	Pre-term birth (7.1%) OR 95% CI	Adjusted OR 95% CI
Parity			
1	29(8.1%)	1.00	1.00
2 and 3	56(6.7%)	0.8(0.5,1.3)	1.02(0.6,1.8)
>4	10(7.5%)	0.9(0.4,1.9)	0.6(0.2,2.1)
Gravidity			
2 and 3	76(6.9%)	1.00	1.00
>4	29(8.3%)	1.3(0.74,2.2)	1.29(0.55,2.7)
Preceding pregnancy outcome			
Pre-term	3(21.4%)	3.6(0.98,13.3)	3.8(0.89,16.5)
SVD	82(6.8%)	0.7(0.4,1.44)	0.74(0.36,1.5)
PPH	4(21%)	3.8(1.2,12)	5.1(1.5,17.1)
C/S	11(9%)	1.3(0.7,2.6)	
Current pregnancy			
Current pregnancy			
Planned	59(6.7%)	0.9(0.6,1.4)	1.01(0.6,1.7)
Contraceptive			
Failure	9(11.4%)	2(0.9,4.2)	1.6(0.7,3.9)
Complications to			
Current pregnancy	18(17.5%)	3.1(1.8,5.5)	3.4(1.8,6.2)
RH factor			
Positive			
Negative			
Unknown	87(7.2%)	1.00	1.00
Birth to pregnancy interval	3(6%)	1.9(0.6,6.4)	0.9(0.25,2.9)
<18 months	3(4.3%)	0.5(0.2,1.8)	0.56(0.2,1.9)
< 24 months			
>60 months			

>72 months	16(8.1%)	1.2(0.67,2.1)	1.7(0.68,4.4)
	24(7.6%)	1.1(0.7,1.8)	0.8(0.34,1.87)
	29(7.5%)	1.7(0.7,1.7)	1.06(0.45,2.5)
	22(8%)	1.2(0.7,1.9)	1.1(0.4,2.72)

Factors associate with Low Birth Weight

Low Birth weight was reported in 7.2% of cases Eighteen (11.3%) mothers who gave birth at age of > 35 years gave LBW delivery. Birth to pregnancy interval of less than 18 month and greater than 72 months had high LBW deliveries 18 (9%) and 24(9.2%), respectively. Six (11.8%) mothers with RH negative blood type had given LBW babies, and 25% of mothers with known cardiac disease have delivered LBW babies Mothers who gave birth after sustaining complications of pregnancy like APH, premature rupture of membrane (PROM),

And PIH had 32.1%, 5.4%, 21.4% LBW deliveries, respectively. Mothers with secondary education level when compared with unable to read and write were less likely to have LBW with OR 0.5 and 95% CI= (0.2, 0.8). Mothers with history of PPH in the preceding delivery and pregnancy complication to current pregnancy has shown a statistical significant association to LBW with OR 3.5 and 95% CI= (1.2,10) and OR 4.5 and 95% CI= (2.6, 7.7) respectively. Generally, no statistically significant association was observed between birth to pregnancy interval and LBW

Table 4- Past obstetrics history and Birth to pregnancy intervals of low birth weight observed in women who give birth for two or more times in Addis Ababa health institutions from Dec to April 2007

Variables	Yes N=94	Pre-term birth (7.1%) OR 95% CI	Adjusted OR 95% CI
Parity			
1	23(6.5%)	1.00	1.00
2 and 3	63(7.7%)	1.2(0.74,1.98)	1.43(0.8,2.5)
>4	8(7.3%)	0.13(0.5,2.6)	1.13(0.4,5.3)
Gravidity			
2 and 3	81(7.5%)	1.00	1.00
>4	14(6.3%)	0.9(0.5,1.65)	0.53(0.2,1.5)
Preceding pregnancy outcome			
Pre-term	1(7.7%)	1.1(0.1,8.4)	0.4(0.04,3.9)
SVD	88(7.4%)	0.7(0.4,1.44)	1.4(0.6,3.5)
PPH	4(21%)	3.8(1.2,12)	4.7(1.3,17)
C/S	6(5%)	0.6(0.3,1.5)	0.7(0.4,1.2)
Current pregnancy			
Current pregnancy Planned	53(6.1%)	0.6(0.4,0.97)	0.72(0.44,1.2)
Contraceptive Failure	7(8.9%)	1.3(0.5,3.1)	0.9(0.3,2.3)
Complications to Current pregnancy	22(21.4%)	4.5(2.6,7.7)	6.05(3.3,11)
RH factor			1.00
Positive	80(6.1%)	1.00	1.86(0.71,4.9)
Negative	6(11.8%)	1.8(0.7,4.4)	1.98(0.84,4.6)
Unknown	8(11.8%)	1.8(0.8,3.9)	
Birth to pregnancy interval			
<18 months	18(9.3%)	1.3(0.8,2.4)	2.5(0.9,6.98)
< 24 months	24(7.8%)	1.1(0.7,1.8)	0.67(0.26,17)

>60 months	29(7.7%)	1.6(0.7,1.7)	0.67(0.25,1.8)
>72 months	24(9.0%)	1.4(0.8,2.1)	1.76(0.6,4.9)

Factors Associate with stillbirth

The occurrence of stillbirth was 3.1%. Fifteen (4.6%) of mothers with the age group 30-34 had stillbirth. Muslims have the lowest (0.4%) stillbirth rate. The maternal age groups with low stillbirth rate were the age group 25-29 and >35 with frequency of 9(1.5%) and 4(2.7%) respectively. This occurrence when compared with maternal age group 15-19 was not significant but when it is adjusted for variables of socio demographic factors, other past medical and obstetric history, preceding birth outcome, complication of labor, current pregnancy out comes and birth to pregnancy interval is less likely to have stillbirth with OR 0.05 and 95% CI (0.005,0.55) and OR 0.04 and 95% CI (0.003,0.6), respectively.

Mothers with educational status of elementary and secondary when compared with those who are unable to read and write with OR 0.2 and 95% CI = (0.1, 0.5) and OR 0.4 and 95% CI (0.17, 0.8), respectively are less likely to have stillbirth. Mothers from Muslim religion compared to Orthodox religion followers with OR 0.1 and 95% CI (0.013, 0.7) were less likely to have stillbirth.

Birth to pregnancy intervals of > 72 months has the lowest stillbirth rate (2.2%). Complications of labor have the highest (10.5%) stillbirth rate, the presence of complications of labor to index (current) pregnancy with OR 5.6 and 95% CI= (2.9,10) was associated with stillbirth. Among infants born with congenital malformations 44.4% were stillbirths with OR 27 and 95% CI = (7,104) associated with stillbirth. Among those mothers who had pregnancy complications to the current pregnancy 10.7% has ended in stillbirth, the presence of pregnancy complication to index (current) pregnancy with OR 4.7 and 95% CI = (2.3, 9.7) had statistically significant association with stillbirth. Form mothers who had known chronic medical problems 8.3% of diabetics, 14.3% of hypertensive and 25% of cardiac patients experienced stillbirth. Generally, no statistically significant association is observed between birth to pregnancy interval and stillbirth.

Table 5: - past obstetrics history and birth to pregnancy interval of stillbirth observed in women who gave birth for two or more times in Addis Ababa health institutions from Dec to April 2007

Variables	Yes N=94	Pre-term birth (7.1%) OR 95% CI	Adjusted OR 95% CI
Parity			
1	12(3.4%)	1.00	1.00
2 and 3	56(6.7%)	0.8(0.5,1.3)	1.02(0.6,1.8)
>4	10(7.5%)	0.9(0.4,1.9)	0.6(0.2,2.1)
Gravidity			
2 and 3	76(6.9%)	1.00	1.00
>4	29(8.3%)	1.3(0.74,2.2)	1.29(0.55,2.7)
Preceding pregnancy outcome			
Pre-term	3(21.4%)	3.6(0.98,13.3)	3.8(0.89,16.5)
SVD	82(6.8%)	0.7(0.4,1.44)	0.74(0.36,1.5)
PPH	4(21%)	3.8(1.2,12)	5.1(1.5,17.1)
C/S	11(9%)	1.3(0.7,2.6)	
Current pregnancy			
Current pregnancy Planned	59(6.7%)	0.9(0.6,1.4)	1.01(0.6,1.7)
Contraceptive Failure	9(11.4%)	2(0.9,4.2)	1.6(0.7,3.9)
Complications to Current pregnancy	18(17.5%)	3.1(1.8,5.5)	3.4(1.8,6.2)
RH factor			
Positive	87(7.2%)	1.00	1.00
Negative	3(6%)	1.9(0.6,6.4)	0.9(0.25,2.9)
Unknown	3(4.3%)	0.5(0.2,1.8)	0.56(0.2,1.9)
Birth to pregnancy interval			

<18 months	16(8.1%)	1.2(0.67,2.1)	1.7(0.68,4.4)
< 24 months	24(7.6%)	1.1(0.7,1.8)	0.8(0.34,1.87)
>60 months	29(7.5%)	1.7(0.7,1.7)	1.06(0.45,2.5)
>72 months	22(8%)	1.2(0.7,1.9)	1.1(0.4,2.72)

Discussion

In this study, it was found that the mean birth to pregnancy interval is 45.9+27.3 months (95% CI 44.4, 47.3). This finding was consistent with the finding from DHS 2005 for Addis Ababa which was 45.2 months (28)

About 65. % had a birth interval less than 18 month while in DHS 2000 it was 8% and 23.9% of non-first pregnancy which occurred less than 24 months and in DHS 2000 it was 20% (17).

Table 6: - Association of birth to pregnancy interval to maternal socio demographic situation among women who delivered for two and more times in Addis Ababa at health institutions from Dec to April 2007

Variables	Yes N=94	Pre-term birth (7.1%) OR 95% CI	Adjusted OR 95% CI
Age			
15 - 19	29(8.1%)	1.00	1.00
20 - 24	56(6.7%)	0.8(0.5,1.3)	1.02(0.6,1.8)
25-29	10(7.5%)	0.9(0.4,1.9)	0.6(0.2,2.1)
30-34			
>35	76(6.9%)	1.00	1.00
Educational Status	29(8.3%)	1.3(0.74,2.2)	1.29(0.55,2.7)
Unable To read and write			
Elementary	3(21.4%)	3.6(0.98,13.3)	3.8(0.89,16.5)
Second	82(6.8%)	0.7(0.4,1.44)	0.74(0.36,1.5)
Tertiary	4(21%)	3.8(1.2,12)	5.1(1.5,17.1)
Religion	11(9%)	1.3(0.7,2.6)	
Orthodox			
Protestant			
Muslim	59(6.7%)	0.9(0.6,1.4)	1.01(0.6,1.7)
Occupation			
House Wife	9(11.4%)	2(0.9,4.2)	1.6(0.7,3.9)
Self Employed			
Government employed	18(17.5%)	3.1(1.8,5.5)	3.4(1.8,6.2)
Current pregnancy planned yes			
Preceding pregnancy mode of delivery			
C/S	87(7.2%)	1.00	1.00
SVD	3(6%)	1.9(0.6,6.4)	0.9(0.25,2.9)

Chronic medical illness Yes (42)	3(4.3%)	0.5(0.2,1.8)	0.56(0.2,1.9)
RH factor	16(8.1%)	1.2(0.67,2.1)	1.7(0.68,4.4)
Positive	24(7.6%)	1.1(0.7,1.8)	0.8(0.34,1.87)
Negative	29(7.5%)	1.7(0.7,1.7)	1.06(0.45,2.5)
Unknown	22(8%)	1.2(0.7,1.9)	1.1(0.4,2.72)
Birth to pregnancy interval			
<18 months			
< 24 months			
>60 months			
>72 months			

The mean birth to pregnancy interval in Addis Ababa was generally higher when compared to other developing country which was three years (36 months) (19). This may happen because the total wanted fertility for Addis Ababa according to DHS Ethiopia 2005 was 1.2. This figure showed that women in Addis Ababa tend to have small family size therefore need to space their children, which affects the birth to pregnancy interval.

From our study we saw that birth to pregnancy interval that happened following planned pregnancies had 1.4 times more chance to occur in greater than 60 months than unplanned pregnancies.

Generally short birth to pregnancy interval (<24 months) is influenced by mothers educational status of tertiary education level, having previous mode of delivery through Cesarean secti9on (CS) and having chronic medical problem. Long birth to pregnancy interval (>60months) is also influenced by planned pregnancy and preceding birth delivered through spontaneous vaginal delivery (SVD). Though the DHS Ethiopia 2005 finding revealed that there is a significant in crease in the median number of months as maternal age increases (27), but our finding was not consistent with that and there was no association observed.

Mothers with tertiary education level have a significant short birth to pregnancy interval. This finding may contradict to the fact that as education increases the desire to limit family size increases. But, the relation between short birth to pregnancy interval and higher maternal education might be explained by; first, the presence of short birth to pregnancy interval might not necessarily reflect big family size. this study used data from two consecutive births only and this data doesn't show the entire birth interval trend. The second reason might be that women who were busy in schooling may get older be fore getting married and have their family.

Birth to pregnancy interval showed no significant association to adverse perinatal outcomes This finding may contradict from other similar studies done in St. Paul's and Tikur Anbessa Hospital in Ethiopia which reported conceiving within 12 months of previous delivery is a critical interval to cause low birth weight (18).

But the finding of this study is consistent with findings from some other countries where they reported that birth to pregnancy interval has no association in causing preterm birth (23). In Sweden the association between birth to pregnancy interval and stillbirth is confounded by maternal socio demographic status (25). And a study done in Boston (USA) reported no relation between inter pregnancy interval and risk of preterm birth (24).

In this study it is observe that factors like having PPH in the preceding delivery and complication of pregnancy and labor to current pregnancy contribute to poor perinatal outcome than birth to pregnancy interval. This finding was almost found to be a universal fact and has been revealed in many studies (1,20,21,22).

The rate of premature delivery and LBW were almost consistent with other studies done in Ethiopia (6,). But the findings from this study showed low rate in LBW and prematurity as compared to the Addis Ababa health bureau 1998 EC annual report (10). This might happen because this study has used preimary data from health facility that might decrease non-response bias and avoids missing data.

The rate of stillbirth in this study was consistent with other findings: the stillbirth rate in less developed countries could exceed

3%. (12). But, much higher than the DHS 2005 report which shoed 1.8%, also from other study done in Ethiopia which revealed 1.9% stillbirth rate (4) and the Addis Ababa health Bureau 1998 EC report 2.5%(10). But also very smaller when compared with another study conducted in Tikur Anbessa Hospital with rate of 5.3% (13).

This may happen because in DHS data is collected by interview technique which creates a recall bias and social desirability bias, culturally most mothers don't want to remember and mention their lost child creating under reporting of stillbirths. This study uses primary data and there is no chance of under reporting while in the Tikur Anbessa Hospital case; it is a hospital where most complicated cases are referred to it, as a result, getting higher stillbirth rate in Tikur Anbessa Hospital might not be strange. This study used data from health centers and this could dilute the stillbirth report from hospitals. In this study also 53% of stillbirths were reported from government hospitals.

Conclusion

Poor perinatal outcome, (LBW, and preterm deliveries), were found to be significantly associated with current pregnancy/labor complications and the occurrence of PPH in the preceding labor but not shown to have an association with birth to pregnancy interval, stillbirth;

Influenced by maternal age>25 years, maternal educational status, religion, complication of pregnancy and labor and presence of congenital malformations. Further study on the effect of birth to pregnancy interval on perinatal outcome that includes another perinatal outcome is recommended.

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ORIGINAL ARTICLE:

COMMUNITY BASED REPRODUCTIVE HEALTH (RH) INTERVENTION RESULTED IN INCREASING AGE AT MARRIAGE: THE CASE OF BEREHANE HEWAN PROJECT, IN EAST GOJAM ZONE, AMHARA REGION, ETHIOPIA

Tekle-Ab Mekbib[1] and Mitike Molla[2]

Abstract

Background: Among adolescent girls aged 10-19 years who are living in West Gojam zone, Amhara region, poor school attendance, social isolation, early marriage and poor utilization of reproductive health (RH) services were observed before the launching of the Berhane Hewan project. To mitigate these problems, Behane Hewan was initiated as a multi-component intervention. After two years of implementation of the project, it was shown that marriage was delayed, school attendance and family planning use increased. However, it was difficult to ascertain which components exerted relatively greater influence in bringing about these behavior changes.

Objectives: To explore the contribution of different reproductive health (RH) and other interventions in delaying early marriage, increasing school attendance and FP utilization.

Methods: A cross-sectional study design was conducted using both qualitative and quantitative methods in August and December 2009, respectively. The qualitative data were collected using nine in-depth interviews while the quantitative data was collected from 150 respondents among fathers; mothers and husbands of girls who were participants of the Berhane Hewan project.

Results: The husband's group was generally younger than parent respondents who ranged from 30-60 years of age.

The vast majority of male respondents were farmers, while females were housewives. The majority of respondents mentioned provision of school supplies as influential in keeping girls in school (88% of fathers, 92% of mothers and 60% of husbands). Among the intervention components that promoted delayed marriage, Community Conversations was mentioned most often by respondents (76% fathers, 66% mothers and 84% husbands). Group mobilization of girls was mentioned by 68% of fathers, 66% of mothers and 78% of husbands. Community conversation (85% fathers, 74% mothers and 76% husbands), group meetings by mentors (56% fathers, 52% mothers and 64% husbands), and house-to-house visits by mentors (48% fathers, 42% mothers

and 44% husbands) were mentioned first, second and third, respectively as intervention components that brought about improvements in FP knowledge and practice among Berhane Hewan program participants. In-depth interviews resulted in giving community conversation, social mobilization and school incentives the same priority sequence.

Conclusion: Community conversation, social mobilization and school material support could be used as major intervention components to replicate the Berhane Hewan program. For those who want to delay marriage and improve RH/FP utilization among adolescent girls, the above interventions could be enough to bring about the desired improvements among adolescents. However, in order to avail opportunities for girls' education apart from the interventions detailed above, school material support is required as one of the interventions to achieve better results. Nevertheless, these preliminary findings have to be strengthened through a carefully monitored qualitative and quantitative study by using major intervention components/models detailed above to explore the critical components that influenced behavior change that would allow Programmers and policymakers to upscale Berhane Hewan in a cost-effective and sustainable manner.

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Introduction:

Arranged marriage at an early age is common in most developing countries in general and in Ethiopia in particular. In these situations, girls are usually forced to marry an older person without their prior consultation and knowledge.

This could result in complicated reproductive health (RH) outcomes. With the advent of HIV and AIDS, this practice is fueling the spread of HIV to girls and women (1). Ethiopian girls are not free from this where culture, underdevelopment and poverty aggravate the situation (2, 3).

In Ethiopia, adolescent girls particularly in rural areas face forced early marriage and have limited opportunities for education (4). In order to understand the situation of adolescence in rural Amhara, a formative research was conducted in 2004. In this study, among adolescent girls aged 10-19 years living in West Gojam zone, Amhara region, poor school attendance, social isolation, early marriage and poor utilization of reproductive health (RH) services were observed (5). In order to improve the situation of adolescent girls, a project was initiated as a pilot in Mosebo Kebele Yimanadinsa Woreda, West Gojam zone, Amhara region. This project, entitled Berhane Hewan ("Light for Eve" in Amharic) has been implemented by the Ministry of Youth and Sports (MOYS) through its regional, zonal and woreda offices in Amhara region, since 2004. The project addresses the wellbeing of adolescent girls in rural Amhara by promoting girls 'education and delayed marriage. Berhane Hewanis currently being implemented in three districts of Amhara region: Yilmanadinsa, Mecha and South Achefer.

Berhane Hewan's overall goal is to delay marriage and support girls who are already married.

The program mobilizes girls aged 10 to 19 into clubs and supports them to remain in school and improve their RH needs through availing information and services. Currently, over12, 000 girls are members of the program.

During the pilot phase, multiple intervention components such as community conversation where community members periodically meet to discuss social matters; and social mobilization activities where mentors conduct house-to-house visits and convene group meetings were implemented. In addition, school material support;

house hold incentives (ewes to adolescent girls); and creating safe spaces so that married

and unmarried girls attend programs such as non-formal education (NFE) and life skill training as well as RH information and referrals for services are also part of the Berhane Hewan program, among others.

Berhane Hewan was evaluated in 2006 and changes associated with the project were observed including delays in marriage and increases in school attendance among younger adolescents and increases in family planning use (6). However, given that Behane Hewan was a multi-component intervention, it was difficult for evaluators to ascertain which components exerted relatively greater influence in bringing about behavior change.

Identifying the critical components that influenced behavior change would allow programmers and policymakers to upscale Berhane Hewan in a cost-effective and sustainable manner. Therefore, the aim of this study was to explore the contribution of different RH and other interventions in delaying early marriage, in increasingin school attendance and FP utilization.

Methods

The study used a cross-sectional study design (both qualitative and quantitative methods) and was conducted in Mosebo kebele, Ylimanadinsa district, West Gojam zone, Amhara region in the Berhane Hewan pilot site, in August and December 2009. An in-depth interview guide was developed for the qualitative component of study.

The quantitative data is based on 150 interviewees and equal proportion of mothers, father, mothers and husbands participated.

Components of the Berhane Hewan

Program interventions

Berhane Hewan was a multi-component intervention that included mobilization of adolescent girls to school, community conversations where community members periodically meet to discuss social matters; and social mobilization activities where mentors conduct house-to-house visits and convene group meetings were implemented. In addition, the program also included school material support; economic incentives; creation of safe spaces, non-formal education (NFE), life skill training, RH information and referrals for services.

Mentors conducted house-to-house visits to identify eligible adolescent girls aged 10 to 19 to participate in the Berhane Hewan program.

Once identified, girls are invited to join the program and if necessary, mentors negotiate with gatekeepers such as husbands and in-laws for the girl's participation. The other

major component of Berhane Hewan is increasing adolescent girls' access to formal and NFE. Adolescent girls who are going to school and those who want to join the formal school are encouraged by the program. School material support is provided to all by the project. Girls who could not read or write can join the NFE clubs in order to get lessons in Amharic alphabet, simple arithmetic, environmental science, English alphabet, etc. After getting the NFE for 18 months, these girls are eligible to join the fourth grade in the formal school.

Community conversation meetings took place twice per month with community members discussing social issues particularly harmful traditionalpractices (HTPs). Participants explore options to address harmful practices affecting adolescent girls such as early marriage, female genital mutilation/cutting (FGM/FGC), and marriage by abduction. Mosebo girls who participated in the Berhane Hewan program ewes to empower them economically.

Selection of respondents

Study participants, including husbands, mothers and fathers were selected purposefully through different girls clubs. The mentors of respective clubs listed the names of the fathers, mothers and husbands of project beneficiaries and selected fifty out of the listed names for the different categories by a simple lottery method out of a total of 300 eligible participants. The project coordinator of the district facilitated the identification of respondents.

Data collection

For the qualitative study, an in-depth interview guide was developed including the following topics: questions about places where adolescent girls meet to chat and mix with other girls other than school and home; school attendance by adolescent girls. It also included questions about the impact of various program components such as economic incentives, community conversations, school material support, and mobilization of girls into clubs. In addition, a standard questionnaire was developed to collect quantitative information on the socio-demographic profile of respondents, school attendance, marriage timing and family planning utilization. Survey participants were asked about the importance of various intervention components in increasing school attendance, delaying marriage and increasing FP use.

Interviewers for the qualitative study were graduates in the social sciences and experienced in qualitative research. They were trained for two days on the discussion guide and qualitative interviewing techniques. On the last day of the training, interviewers pre-tested the instrument among respondents from Bahirdr and discussed how to improve the guide and their interview techniques. Two interviewers, one male and one female, were assigned to the research site. The male interviewer interviewed males, and females interviewed females. Where possible, the interviews took place at participants' homes.

Interviews were conducted in Amharic, tape recorded, translated into English and transcribed. Likewise, the survey questionnaire was conducted in Amharic. Informed consent was obtained from all respondents

Data processing & analysis

Qualitative data was analyzed comparing similar themes across the three types of informants and summarized. Quotes are used in the report to reflect illustrative or common themes that emerged from respondents. The data from completed questionnaires were analyzed using simple frequencies followed by ranking of responses. Averages and distribution tables are presented.

Results

Profile of respondents

Nine individuals, three from each group- fathers, mothers and husbands - took part in depth interviews. The husband's group was generally younger than parent respondents who ranged from 30-60 years of age. The demographic profile of respondents for the rapid assessment survey appears in Table 1. The vast majority of male respondents were farmers, while females were housewives. Their age ranged from 20-71, and husbands were younger than other respondents.

Characteristics	Mothers (n=50)	Fathers (n=50)	Husbands (n=50)	All	Percent
Age					
20-30	12	2	33	47	31.3
31-40	21	11	11	43	28.7
41-50	12	23	2	37	24.7
Greater than	5	14	4	23	25.3
50	48	43			
Literacy	2	7	43	134	89.3
Illiterate			7	16	10.7
Literate*					
Occupation	50	-		50	33.3
	-	50	-	100	66.7
Housewife			50		
Farmer					

School attendance

Table 2 shows the percent of respondents who reported specific programmatic components as influential in promoting girls' school attendance.

The majority of respondents mentioned the provision of school supplies as influential in keeping girls in school (88% of fathers, 92% of mothers and 60% of husbands). The next most commonly mentioned component was the economic incentive (44% of fathers, 52% of mothers and 36% of husbands). The third most common response was the mobilization of girls, which was mentioned by 38% of fathers, 28% of mothers and 48% of husbands.

School attendance

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economic incentive (44% of fathers, 52% of mothers and 36% of husbands). The third most common response was the mobilization of girls, which was mentioned by 38% of fathers, 28% of mothers and 48% of husbands.

Table 2: Intervention components contributing to the increase in school attendance by category of respondents

Intervention component	Fathers		Mothers		Husbands		All
	n	%	n	%	n	%	%
Supply of school materials	44	88	46	92	30	60	80.0
Providing ewes to girls	22	44	26	52	18	36	44.0
Group meetings led by	19	38	14	28	24	48	38.0
mentors	22	44	8	16	16	32	30.6
Community Conversation	4	8	10	20	15	30	19.3
Mentors house to house visits	8	16	4	8	9	18	14.0
Providing wells to	5	10	3	6	11	22	12.6
communities							
Household improvements							

Incentives like school material support were considered as motivating factors for families to send their daughters to school:

'… nowadays people prefer to have girls than boys because of their girls get school materials and these incentives helped girls to go to school and to delay early marriage.' (Husband, age 28, farmer, literate) Although some mothers in the survey mentioned economic incentives, a mother underscored the importance of school material support for her daughters' continuation of participation in Berhane Hewan program, and its effect in increasing girls' confidence in continuing

"My *three children are members of Berhane Hewan and they get exercise books and pens. When they receive these materials, I keep them safely and give my children whenever the need arises. That way, they are put in good use."* (Mother, age 50, house wife, illiterate)

Delayed marriage

The impact evaluation of the Berhane Hewan program showed a considerable reduction in marriage among girls aged 10-14 (6). However, the marriage of older adolescent girls seemed to accelerate after age 15, suggesting that the earliest marriages were deferred to later adolescence. In this study, when asked about program components that promoted delayed marriage, community conversations were mentioned most often by respondents (76% fathers, 66% mothers and 84% husbands) (Table 3).

Table 3: Intervention components contributing to the delay in early marriage by category of respondents (n=150)

Intervention component	Fathers		Mothers		Husbands		All
	n	%	n	%	n	%	%
Community Conversation	38	76	33	66	42	84	75.3
Group meetings	34	68	33	66	39	78	70.6
Mentors house to house visits	15	30	16	32	14	28	30.0
Supply of school materials	4	8	4	8	1	2	6.0
Providing ewes to girls	2	4	1	2	3	6	4.0
Providing wells to communities	3	6	1	2	2	4	4.0
	-	-	2	4	3	6	3.3

Group mobilization of girls was mentioned by 68% of fathers, 66% of mothers and 78% of husbands. Most in-depth interview participants mentioned that they were no longer supportive of the practice of early marriage as a result of the program:

'… some people think a girl should marry if she fails from grade 8 or 9, but I wouldn't do that. I will help her to engage in small trade. I learned the harmful effects of early marriage from the Berhane Hewan Program'. (Mother, age 30, housewife, illiterate)

The contribution of the Berhane Hewan Program in delaying early marriage was profound. Some respondents described that girls started challenging their parents' decisions about marriage:

'… previously, parents used to arrange marriage for their daughters, but nowadays, the girls are aware of the consequences of

early marriage and they say no to it! Before the program, at least 15 arranged marriages occurred annually but after the project, there is no arranged marriage for very young girl in our community.'

(Mother, age 50, housewife, illiterate)

Fathers, mothers and husbands interviewed indicated that the program engaged almost everyone in community conversations, with initial participants encouraging others to attend.

To this effect, people in the area have committed themselves in eliminating HTPs like FGM and early marriage.

'… in my view, after Berhane Hewan, harmful traditions are vanishing. Nowadays, girls in Mosebo arerequired by the Kebele administration to take a medical check-up before marriage to confirm if they are not below 18 years of age.' (Father, age 60, farmer and literate)

Participation of girls in Berhane Hewan unmarried girls club was mentioned as one of the most important factors in delaying early marriage; it was described by one of the respondents as follows:

'A woman asked her daughter to marry before she died. The girl refused and the father also tried to force her, but the girl continued to refuse because of information she got from the clubs'

(Husband, age 33, farmer, and illiterate)

Respondents described 'community conversations' as an effective tool in delaying marriage and keeping girls in school:

'… the knowledge we got from the conversations helped the community to understand the harmful effects of early marriage. Therefore, we understand the need for keeping our daughters in school.'

(Father, age 50, farmer and literate)

Increased family planning utilization

According to the impact evaluation study, increase in family planning utilization was one of the impact indicators that were observed during the pilot phase among Berhane Hewan program participants (6). Community conversation (85% fathers, 74% mothers and 76% husbands), group meetings by mentors (56% fathers, 52% mothers and 64% husbands), and house-to house visits by mentors (48% fathers, 42% mothers and 44% husbands) were mentioned first, second and third, respectively as intervention components that brought about improvements in family planning knowledge

and practice among Berhane Hewan program participants (Table 4).

Table 4: Intervention components contributing to the increase in family planning utilization by category of respondents (n=150)

Intervention component	Fathers		Mothers		Husbands		All
	n	%	n	%	n	%	%
Community Conversation	41	82	37	74	38	76	77.3
Group meetings	28	56	26	52	32	64	57.3
Mentors house to house visits	24	48	21	42	22	44	44.6
Supply of school materials	1	2	2	4	6	12	6.0
Providing ewes to girls	1	2	-	-	1	2	1.3
Providing wells to communities	1	2	-	-	-	-	0.6
	-	-	1	-	-	-	0.6

Community conversation reportedly helped to create awareness about family planning. Fathers who sought to delay child birth described their circumstances:

'I have one daughter who is seven years old… after we started participating in community conversations; I didn't want to have another child for some time. The project provided us with inject able contraceptives and my wife has been using it since.) (Father: age 45, farmer and illiterate).

Husbands credit mentors, as major contributors in creating awareness about family planning and keeping girls at school:

'… If there is a problem in the family, mentors would try to handle it by discussing with parents. They also advise parents to use family planning, because if mothers give birth, the daughters have to abstain from school to help the family.' (Husband, age 38, farmer and literate)

Table 5 summarizes responses of study participants regarding influential intervention components associated with increased school attendance, delayed marriage and increased family planning use. The most commonly mentioned components are the supply of school materials, community conversation and group meetings led by mentors.

Table 5: Intervention components and their contribution to outcome indicators by respondents (n=150)

Intervention component	Increase school attendance N % (out of 150)		Delayed early Marriage N % (out of 150) N		Increase in family planning use % (out of 150)		All* %
Community Conver-sation	46	31.0	113	75.0	116	77.00	61.1
Group meetings	57	38.0	106	71.0	86	57.0	55.3
Mentors visits	29	19.0	45	30.0	67	45.0	31.3
Supply of school materials	120	80.0	9	6.0	1	0.7	28.9
Providing ewes	66	44.0	6	4.0	1	0.7	16.2
Household improvements	24	16.0	6	4.0	9	6.0	8.6
Providing wells	21	14.0	5	3.3	1	0.7	6.0

*Interviewee responded to three sets of questions about outcome indicators.

Discussion

This rapid assessment indicated that community conversations, social mobilization by girl mentors and provision of school materials contributed to the increase in girls' school attendance and the increase in age of marriage of girls.

Though this study examined the impact of the interventions in a specific population where the intervention was conducted, the impact may not be purely attributed to the Berhane Hewan intervention. Media and the global initiatives like the Millenium Development Goals could have also impacted the change. Established in 2004 as a pilot program, the Berhane Hewan Project has been supporting rural girls to stay in school and to delay the age of marriage by providing school material and through social

mobilization and community awareness. The current rapid assessment used both qualitative and quantitative methods to identify the interventions that contributed towards increasing the age of marriage

Community conversation: This intervention component when ranked by respondents as the most influential component in delaying the age of marriage and improving the utilization of family planning services. Community conversation was geared towards achieving abandonment of HTPs, particularly early marriage, FGM/C and marriage by abduction; motivate community members to use RH/family planning services, and finally convince parents to send their daughters to school. Community conversation also proved to be effective in decreasing HTPs in the SNNPR by other projects (2). This finding also suggested that this tool could be effectively used to transform communities to achieve better health and development in a cost-effective manner.

Social mobilization: This intervention component consisted of group meetings led by mentors and house-to-house visits by mentors. In the overall analysis of intervention components, social mobilization was ranked second (55.3%). This approach has opened opportunities for adolescent girls to acquire the necessary skill and knowledge in RH and safe motherhood to overcome their social and health needs.

Mentoring has rarely been used as an intervention strategy in rural Ethiopia, but rural girls and families accepted it very well. It is a sustainable approach that can be integrated into the activities of health extension workers.

Supply of school materials: School material support was found to be an essential intervention component that helped parents to send their daughters to school, which otherwise may not have been possible. Questions about school materials specifically referred to the influence of these materials on increased school attendance, therefore, this data may not be appropriate for determining the relative importance of school materials compared to other components in regards to their impact on delaying marriage or increasing family planning use. As a result, this analysis may not provide an accurate reflection of the effectiveness of this particular component on delayed marriage.

Interventions such as community conversation and social mobilization along with school material support can be instrumental in efforts to increase school attendance for adolescent girls in the studied area and beyond.

In rural Ethiopia, where the primary school enrollment of rural girls is low, supporting girls' education is justified (7). Studies also suggest that educating girls is associated with increased age of marriage, decreased family size and increased child survival.

Community conversation, social mobilization and school material support can be used as major intervention components to replicate the Berhane Hewan program in other areas of the country. This rapid assessment showed several options that program planners can consider when choosing intervention components based on the availability of resources and effectiveness of the intervention. However, these preliminary findings can be strengthened through carefully monitored qualitative and quantitative studies in which various intervention models are implemented in different communities to identify the most cost-effective, efficient and scalable approaches. Adolescent girls need to acquire the necessary skill and knowledge in RH and safe motherhood to overcome their social and health needs.

Acknowledgment

The rapid assessment to explore the effectiveness of the Berhane Hewan project would not have been possible without the support of the Amhara Regional Bureau of Youth and Sports and the United Nations Population Fund (UNFPA). We wish to thank Annabel Erulkar, Country Director, Population Council for the constructive comments on the draft report. Our thanks also go to Adey Muche, an Intern from UK, and Yared Mulugeta, research assistant for coordination, supervision and actual monitoring of the survey as well as data collection. Finally, we thank the mothers, fathers and husbands of the adolescent girls participating in the Berhane Hewan program for sharing their ideas and experiences.

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PROGRAM BRIEFS

Engender Health

Engender Health is a leading global reproductive health organization that works in 27 countries e train local health professionals to provide high quality care to women and families to partner with governments and communities to make sure that every pregnancy is planned, every child is wanted, and every mother has the best chance of survival.

Engender Health in Ethiopians an overview

In partnership with government offices and nongovernmental organizations, Engender Health works to make quail reproductive health care available to all Ethiopians From 1987 to 1998, Engender Health trained local health professionals to provide Norplant insertion and removal, infection prevention, and medical monitoring and supervision, Engender Health also developed and supported the adoption of technical guidelines to ensure and maintain standards and addressed policy and service delivery constraints.

As a result of this work, contraceptive sterilization and family planning counseling became accepted components of the national family planning program since 2001, Engender Health resumed and expanded its work in Ethiopia to increase use of long acting and permanent methods (LAPMs) of family planning, including male and male sterilization, IUDs, and implants. These efforts led to an increase in the number of LAPM clients served yearly in Engender Health supported sites from 1,292 in 2002 to 11,485 in 2007.

More recently, to address the low level of knowledge about and demand for LAPMs in Ethiopia, Engender Health developed and implemented an LAPM awareness strategy in Amhara.

This campaign demonstrated the success of method specific promotion in increasing demand and use, the government has requested that Engender Health expand the IUD revitalization effort to additional woredas in Amhara and to other regions Engender Health Ethiopia continues to work to reduce maternal mortality and morbidity by increasing contraceptive use and expanding access

to safe abortion care in public health facilities in Ethiopia. Launched in 2008, the Access to Better Repro du cove Health Initiative (ABRD project seeks to:

- Increase the availability, quality, and use of integrated Comprehensive Con mace on (CO and Comprehensive Abortion Care (CAC) services.
- Increase knowledge about and accept ability of CC and CAC services to ultimately increase service uptake, and
- Create an enabling environment for sustained quality service delivery

ABRI has so far helped close to 1.7 million women and men access family planning services in supported facilities, as well as more than 8,000 women to access abortion-related care. Ken achievements, as of the end of September 2010 include,

- Identifying and addressing gaps to en sure service readiness and capacity;
- Strengthening national training systems and capacity,
- Training 430 facility-based providers and 128 clinical supervisors in CC and CAC; at 47 health facilities.
- Introducing facilitative supervision (FS) and quality improvement (QD approaches and introducing Client-Oriented, Provider-Efficient (COPED)
- strengthening the youth friendliness of CC and CAC services;
- Increasing awareness of and use of services through targeted behavior change communication strategies, including mass media and client counseling materials;
- Establishing referral mechanisms between community volunteers and public health centers, and
- Contributing to the development and dissemination of supportive policies, guide lines, and tools

strategy and technical approach

Engender Health's comprehensive Strategy and Technical Approach accounts for current lenges with weak health and human resource systems, the government's health extension program (HEP, the decentralization of health services, the lack of information and demand for services, and the controversy and stigma associated with abortion services in particular. Moreover, our strategy applies Engender Health's extensive experience and lessons learned in expanding use of quality

reproductive health services in Ethiopia over the past 20 years, and internationally over the past several decades. Accordingly, we employ the following strategies and approaches to achieve our:

Technical approach:

- Identifying and addressing the most critical supply, demand, and policy determinants
- Focusing on integration of CC and CAC services within the overall reproductive health services
- Institutionalizing and sustaining services
- Collaborating with all key local and international partners

Comprehensive programming

Engender Health addresses three dimensions of comprehensive programming: the supply, demand, and enabling environment. Engender Health's comprehensive programming model centers on the service encounter between client and provider, with supply, demand, and advocacy elements working in synergy to achieve quality client-provider interactions, resulting in more services to more people in more places.

For more information, please visit www.engender.org

Or

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Consortium of Reproductive Health Association (CORHA)

Introduction

The Consortium of Reproductive Health Aiarioos(CORI Introduction The Consortium of Reproductive Health Associations (CORHA), formerly known as COFAP, was formed in 1993 as a loose affiliation of the few Ethiopian and International NGOs that were then offering integrated MCH and FP ser. vices in the country. However, it was in 1995 the seven founding members (Family Guidance Association of Ethiopia, Marie Stopes International Ethiopia, Ethiopian Evangelical Church Mekane Yesus, Ethiopian Gemini Trust, Naareth Children's Centre Integrated Development, Save the Children Federation-USA, and Good Shepherd Family Health Care Services) ratified and signed the Consortium's Memorandum of Association.
Recognizing that the new Reproductive Health concept offers opportunities to broaden the scope of existing programs, addresses the needs of a wider range of people across all stages of life, and increases the role of the Consortium its members in the Reproductive Health continuum, the General Assembly of CORHA convened in 2002 and decided the change of CO FAP to CORHA.

Today, CORHA is re registered as an Ethiopian Resident and Foreign Charities and Societies Consortium and has more than 100-member organizations.

CORHA's Vision

Vibrant, dynamic and proactive member of the civil society with broad based membership and centre of excellence in coordination, capacity building, and advocacy in Sexual and Reproductive Health and Rights in Ethiopia.

Mission

CORHA is a member driven umbrella organization of NGOs committed to the provision of comprehensive integrated sustainable SRH information, services and rights in Ethiopia Its

ultimate goal is improving the overall SRHR status and the quality of life for all the people thereby contributing to national development. CORHA strives for equiry and empowerment of communities and members through effective partnership and participatory processes in repro ductile health and rights in Ethiopia

Strategic Objectives Key Result Areas

There are four strategic objectives key result areas that were identified during the revision of CORHA's five-year strategic plan 2006-2010). These include. Advocacy. Representation, Networking and Coordination Capacity Resource Mobilization CORHA has made notable achievements in the identified areas over the past years Some of the achievements made in the above areas are described below.

Advocacy

In 2002, CORHA has formed an advocacy coalition group "National Advocacy Network" comprising 13 member and partner organizations to advocate on common issues of concern and bring about changes in policy, laws, and programs affecting SRH issues To support the efforts of the NAN, CORHA has led and under taken different studies that served as inputs for evidence based advocacy. At the time when contraceptives shortage has been a serious problem in most parts of the country, CORHA

has conducted an assessment on contraceptive needs, and also developed a documentary film that shows the need of the clients and the prevailing shortage of die findings and the subsequent advocacy efforts have brought about major achievements that resulted in budget allocation by the Federal and regional governments Through the advocacy effort of the NAN, wavering of taxes was also allowed for the purchase of contraceptives. CORHA has also carried out assessment on SRH situation of student. In higher academic institution of the four-major region (Tigray. Amhara, SNNPR, and Oromia) of the country The dissemination the findings of the study and the subsequent advocacy have brought about mayor achievements that resulted on the expansion of the provision of SRH information and services in higher learning institutions to address the identified SRH concerns of students of different universities.

Representation, Networking and coordination

CORHA represents its member organizations in Governmental, non-governmental and donors' forums such as the HPN donors' group and the Steering Com of the Protection of Basic Services (PBS) Project.

There are many NGOs providing reproductive health information and services in the country. CORHA coordinates the activities of these organizations The coordination model has contributed to minimize duplication of efforts and wastage of resources. Activities that were un tended to strengthen networking and coordination among the reproductive health community have been carried out over the past decade. CORHA organizes different forums where members and partners discuss on reproductive health issues of common concern and hold common positions. CORHA organizes in country experience sharing visits in areas where good practices exist to allow participants learn from each other and replicate similar initiatives for their program success.

The reproductive health Gin carried out regularly at regional level(conducted up to now in Addis Ababa, Oromia, Amhara and SNNPR) have played significant role in promoting strong partnership among NGOs and the government sector and creating an excellent opportunity for reproducer health organization to share their experiences and strengthen their future collaboration Likewise, CORHA's bi annual bulletin and quarterly newsletter are instrumental in sharing best practices amount the RH community and updating members in upcoming events in the RH arena To maximize the use of in-country technical resources, strengthen partnership, and of joint undertakings, ensure ownership CORHA has formed different Technical Working Groups (TWGs) by thematic areas The Resource Sharing Center located in the premises of CORHA as created an opportunity to members and partner to access new materials on RH including electronic versions produced in the country and elsewhere. OORHA's website is also another means for information sharing among member and pannier organizations.

Capacity Building

In its effort to build the capacity of member organizations, CORHA develops and updates training curricula, manuals, guidelines, supervision checklists and LEC/BCC materials in collaboration with Government, member, and partner organizations. Through USAID assistance and in collaboration with the Federal Ministry of Health. CORHA has developed the Community Based Reproductive Health Training Curriculum, service delivery protocols and supervision manual. It has also developed a comprehensive Facility Based Reproductive Health Curriculum. All NGOs in the field and the Government have been using these materials The Consortium has also developed a curriculum on Home Based Care(HBC) for people living with HIV/AIDS for national use. With these training curricula, CORHA has been engaged in providing TOTs for member and partner organizations.

CORHA has carried out various capacity building trainings in order to build and strengthen the capacities of service providers, program managers, board of directors and administrative and financial personnel of member and partner organizations including the public sector.

Resource Mobilization

CORHA works towards diversification of its resource base with the aim to strengthen its in situational capacity and that of its members as well as for the expansion of RH programs. With the above-mentioned objective, CORHA has secured financial assistance from Sida since 2004. 25% of this grant is used for enhancing the capacity of CORHA secretariat and its members, and 75% is used to implement Integrated RH/FP, ARH, and HIV/AIDS Program through community-based approach in a total of 12 woredas of Amhara, Oromia and SNNP regions.

The program is being implemented through four local NGOs which are members of CORHA.
Up to now, over 19 million SEK (Swedish Kruner) is secured out of which more than 14 million SEK has been channeled to the sub grantees. About 3.1 million People residing in the 12 das are benefiting from this project. Mothers and children are receiving maternal and child health care

ARH information and services are provided to youths; and couples are getting FP services. About 100,065 CYP is generated from January 2006 July 2010, in the project catchments areas.

JHPIEGO

Introduction **JHPIEGO** is an international development organization that works to prevent the needless deaths of women and their families around the world. Founded in 1973, it is an affiliate of Johns Hop- kins University with more than 700 employees worldwide, Jhpiego is currently working in 54 countries and has experience working in 154 countries

Our Mission Ihpiego enhances the health and saves the lives of women and families in limited resource set. Tings. For nearly four decades, we have put evidence-based health innovations into everyday practice to overcome barriers to high-quality health care services for the world's most vulnerable populations from our origins as technical experts in reproductive, maternal and child health, Jhpiego has grown to embrace new challenges, including prevention and treatment of HIV/AIDS malaria and cervical cancer reflecting the increasing interconnectedness of global health.

Our Vision

Jhprego empowers frontline health workers by designing and implementing effective, low cost. handson solutions that strengthen the delivery of health care services, following the household-to hospital continuum of care. We partner with organizations from the community to the national level, building sustainable, local capacity through advocacy, policy development, and quality and performance improvement approaches.

Our Approach

- Building local human resource capacity
- Working in partnerships with government, nongovernmental organizations, universities, professional associations and communities
- Strengthening health care systems
- Developing evidence- based innovations & sharing best practices

Our Technical Expertise

Worldwide, Jhpiego works on family planning maternal and newborn health, post partum hemorrhage, malaria in pregnancy, cervical can HIV/AIDS.

Jhpiego in Ethiopia

Since 2004, with funding from President's Emergency Plan for AIDS Relief(PEPFAR) through the Centers for Disease Control and Prevention(CDC), Jhpiego has been providing support to the Federal Ministries of Health Education and Defense on capacity building for quality HIV prevention, care and treatment services. Jhpiego program areas in HIV/AIDS in clude:

- Prevention of Mother to Child Trans mission of HIV(PMTCT)
- Standards Based Management and Recognition(SBMR)
- Infection Prevention
- HIV Counseling and Testing(HCT)
- Male Circumcision(MC)
- Pre-service Education
- Electronic(e) Learning
- Training Information Monitoring System

Jhpiego has been funded by USAID to implement Maternal and Child Health activities initially through the ACCESS program and currently the Maternal Child Health Integrated Program (MCHIP). with funding received from UNICEF and USAID through IFHP, Jhpiego works to expand and strengthen healthcare providers through Basic Emergency Obstetrics and Newborn Care(BEmONC), Jhpiego is also funded by PEPFAR through the Department of Defense(DoD) to implement Medical Male Cir. Cumcision (MC) services in the Ethiopia National Defense Forces.

Major Activities

- Strengthening the capacity of health care providers by providing Basic Emergency Obstetrics and Newborn Care (BEmONC) trainings.

- Improving the quality of maternal and newborn health (MNH) services in Ethiopia by implementing Standard Based Management and Recognition (SBM-R) as a quality improvement method.
- Providing different HIV Testing and Counseling courses, developing new training packages and instituting best practices by working with partners.
- To provide safe, comprehensive, and high quality Medical Male Circumcision (MMC) services for HIV prevention.

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INSTRUCTIONS TO AUTHORS

1. Type of Articles

The Ethiopian Journal of Reproductive Health (EJRH) publishes original articles, Review articles, short reports, program briefs, and commentaries on reproductive health issues in Ethiopia, and the African region. The ERJH aims at creating a forum for the reproductive health community to disseminate best practices, and relevant information on reproductive health.

Original Articles: Articles reporting on original research using quantitative and/or qualitative studies could be submitted to EJRH.

Review Articles: Review articles on all aspects of reproductive health issues could be considered for publication in the EJRH.

Commentaries: Commentaries on any aspects of reproductive health in Ethiopia or the African region will be considered for publication in the EJRH.

Program briefs: A one or two pages of description of a program run by governmental or nongovernmental organization could be submitted for publication. These briefs should give short summaries about the objectives, strategies for implementation, and expected outputs of programs that are executed by different organizations.

Short Reports: Preliminary research findings or interesting case studies could be presented in a summarized form to the journal.

2. Uniform Requirements

In order to fulfill uniform requirements for the journal, the following instructions have to be followed by authors:

Manuscript layout: Manuscripts should be written in English and typed double spaced leaving generous margins. Pages should be consecutively numbered. The body of the manuscript should be organized under appropriate headings and sub headings such as introduction, methods, results, discussion, acknowledgements, and references.

Title page: the title page should have title of the article; name of each author and institutional affiliation, and address of the corresponding author.

Abstracts: articles should have abstracts of not more than 250 words. It should summarize the background, objective, methods, major findings and conclusions.

Tables and Figures: all tables and figures should be submitted on separate sheets of paper and be clearly labeled in the order of their citation in the text. A reader should be able to read only the tables and easily understand all information without reading the text.

Reference: References have to be numbered consecutively in the order in which they are first mentioned in the text. Reference must also follow the Vancouver system.

3. Submission of Manuscripts

Manuscripts should be submitted to the Editor in three good quality copies accompanied by a cover letter signed by all authors. In addition, an electronic copy of the article has to be submitted via email to the journal. When articles are accepted, authors will be required to submit a filled 'Author (s) Guarantee form', which certifies that all authors have contributed to worked submitted, and that the content of the manuscript has neither been previously published nor being considered for publication elsewhere. Please note that Case Reports and faxed submission of manuscripts will not be accepted.

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ORIGINAL ARTICLE:

REDUCING MATERNAL MORTALITY AND INCREASING USE OF SKILLED BIRTH ATTENDANCE: ETHIOPIA AND MDG-5

Marge Koblinsky[1], Frances Tain[2] and Solomon Tesfaye[3]

Abstract

The two indicators for Millennium Development Goal 5-reduction of the Maternal Mortality Ration and increased use of skilled birth attendance-reflect the present challenges for Ethiopia. With an early 1990s' estimate of the MMR at 871, Ethiopia is unlikely to reach the MDG 5 target for 2015 of 218 given that the 2005 estimate is 673; the MMR continues to be persistently hi8gh. Over the decade prior to 2005, use of skilled birth attendance remained low at 6% the only relevant indicators with improvement in that period are the fertility decline from 6.4 to 5.4 and an increased contraceptive prevalence to 15% Barriers are many stating with geographical vastness, unavailability of transport, low women's education, early marriage, high fertility, and gender-biased decision-making, preference for com-munity solutions to manage ill health and low availability and use of maternal health services. The paper reviews the available literature on the two MDG5 indicators. The challenges to address the goal of MDG 5- improved maternal health- remain daunting in Ethiopia.

Ethiopian Journal of Reproductive Health, 2010, 4(1):4-15

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Introduction

With a population of 74.5 million in mid-2005 and 2.8 million births per year (1,2) Ethiopia's estimated maternal mortality ration (MMR) of 673-720 per 100,000 live births in 2005 (2,3) equates with 19,000 maternal deaths per year. Ethiopia is one of the top five countries with the highest number of maternal deaths world-wide (3).

Contributing factors to this death toll include early age at marriage, high fertility, low availability and use of maternal health services, extremely low population density (72/km2) with few roads and vehicles for the 85% of the population living in rural areas, and low literacy of women with 89% of the poorest quintile unable to read (2). Measures of development for Ethiopia, whether it be the Human Development Index (169th out of 177 countries), the Human Poverty Index (HPI-1) (105th of 108), or the Gender Empowerment Measure (GEM) (72nd of 93) (4) imply a level of development that is affected by and affects health.

Yet the Ethiopian government was one of the first in Africa to make a strong commitment to the United Nation's inspired Millennium Development Goals (MDGs) by making the MDG targets central to its national development strategy (5). The MDG 5 goal it to improve maternal health but meeting the MDG 5 target of reduction of maternal mortality by three quarters between 190 and 2015, would mean reducing Ethiopia's MMR to 218/100,000 live births by 2015 from the 1990 estimate of 871. A 2008 mid-term review of the health Sector Development Program (HSDP-III) found that this is unlikely to happen given the Programs' present status (6). In this paper, we review the status of the maternal indicators for MDG 5, specifically the data on the MMR and on use of skilled birth attendants

Methods

Literature review used Mesh and Pub-Med data sources and the following broad search terms (maternal mortality, maternal health services, maternal-child health centers, pregnancy complications and Ethiopia). References tracked from relevant articles were traced from library of the University of Addis Ababa specifically from its faculties of Medicine and public health. We retrieved 276 abstracts from the two sources and 84 articles were eligible to use for this review. As this is a literature review, no ethical review was required.

Results

MDG 5: Improving maternal health: progress towards the indicators

Indicator 1-Reduce the maternal mortality ratio (MMR)

MMR levels

MMR estimates in Ethiopia vary considerably. But since the 1980 estimate of 2,000 per 100,000 live births (7,8), estimates have declined to 1400 in 1990 (9), 850 in 2000 (10) and 720 in 2005 (460-980) (Table 1) (11). The Ethiopian Demographic and Health surveys of 2000 and 2005 give figures for the period 0-6 years prior to the surveys: 871 and 673/100,000 live births respectively (2,12). As the confidence intervals of these two numbers overlap, it is not possible to conclude that there has been a decline. According to EDHS 2005 (2), the 95% confidence interval of the 2000 MMR lies between 703 and 1039 while that for 2005 ranges from 548 to 799.

Table 1. Estimated Maternal Mortality ration, Ethiopia 1980 to 2005

Year	MMR (per 100,000 live births)	Method	Reference
1980	2,000	Estimated	United Nations (8); Catipovich (7)
1981-1983 Addis Ababa	566	Population-based survey, Addis Ababa	Kwast et al (13)
1986-1990 Jimma town	402	Cross sectional retrospective	Mersha et al (14)
1987-1996 Butajira, south-central Ethiopia	581-665	Direct observation, case-control, sisterhood	Berhane (37)
1990	1400	Estimated	WHO, UNICEF ((9)
1991 Illubabor	570-725	Indirect sisterhood method	Shifera and Tessema (38)
1995	1800	Sisterhood	WHO, UNICEF, UNFPA (39)
2000	850	Sisterhood	WHO, UNICEF, UNFPA (10)

	871	Sisterhood	EDHS (12)
2005	720	Sisterhood	Hil et al (11)
	673	Sisterhood	EDHS (2)

Beyond the EDHS, population-based studies qare few and none are current. An often-quoted Population based study in Addis Ababa found 45 maternal deaths among the 9,115 live births in 1981-1983 for a MMR of 566/100,000 live births (13).

Since then other population-based studies have reported similar rates (Table 1). Hospital studies reporting maternal deaths typically give higher MMRs (Table 2) - up to 2600 per 100,000 deliveries.

Table 2: Maternal mortality ratios in 5 hospitals, from 4 regions (Addis Ababa, SNNPR, Oromiya and Tigray) Ethiopia, 1990-2005

Hospital and area, study years	MMR 100,000	Maternal Deaths	Denominator	Period
Tikur Anbessa Hospital, (Addis Ababa)	961	Not available	Not available	1980-1995
Attat Hospital (SNNPR)	2120	13	613 live births	1987
Jimma Hospital (Oromiya)	2616	22	241 deliveries and 573 abortions	1991-1992
Adigrat Hospital, (tigray) 1993-2003	448	32	7150 singleton births	1993-2003
Ambo Hospital (Oromiya)	1852	73	3941 live births	2001-2005

Causes of maternal deaths

In population-based studies of the 1980s and 1990s, septic abortion was the major direct cause of maternal deaths contributing about 50% in the 1981-83 Addis Ababa study. Other maternal death causes in order of percentage contribution were puerperal sepsis, hemorrhage, hypertensive disorders, and ruptured uterus (13,14). Hospital based studies of the same period also found septic

abortion to be the major direct cause of mortality (15,16) However, in 2001-2005 a study conducted in Ambo Hospital, Oromiya Region (17) found hemorrhage contributing the largest proportion (55%) although uterine rupture was the primary underlying cause (25 of the 73 deaths).

Ruptured uterus and obstructed labor have been continuing problems noted in hospital maternal mortality studies, with ruptured uterus contributing between 13% to 32% of maternal deaths (15, 18, and 19). A 10-year review in Jimma Hospital (1990 to 1999) (20) found 7% of deliveries had obstructed labor with a case fatality rate (CFR) of 9%, primarily due to ruptured uterus. Cephalo pelvic disproportion was the cause of 81% of the obstructed labor cases, and most (63%) ended in stillbirths; among the babies that lived a quarter had perinatal asphyxia with an Apgar scoreless than 7 at the first minute (20). In another rural hospital, Attat, a 1991-95 prospective study of 245 patients with ruptured uterus reported a CFR of 5.3%; 98% had a stillbirth (18).

Indirect causes have been a major problem in the past, contributing to 31% and 14% to the maternal deaths in the hospital studies in Addis and southwest Ethiopia respectively: such causes include infectious hepatitis, malaria, and pneumonia among many others (15, 16). The Addis Ababa population-based study of the early 1980s found nearly half the maternal deaths were from indirect causes, with infectious hepatitis contributing to a third of these deaths (13). Another Study in Addis Ababa teaching hospital showed that pregnant women were more susceptible to hepatitis E infection than other hepatitis viruses, and that HEV was associated with high maternal as well as neonatal mortality (21).

Fertility change

High fertility contributes to maternal mortality primarily through use of unsafe abortion for unwanted or poorly timed pregnancies. Ethiopia has witnessed a fertility decline over the past 20 years- from 6.4 to 5.4 (2) – yet, women stated that they want a four-child family but have an average 1.4 children more (2). Part of the fertility decline can be attributed to increasing use of contraception. At 14.7% in the 2005 EDHS, the contraceptive prevalence rate has tripled since the 1990 NFFS (4.8%) with much of the increase in modern methods, particularly injectables (increased from 3% to 10% over 15 years).

Nutritional Issues

Severe and milder forms of anaemia have been linked with maternal mortality (25). According to the EDHS 2005 (2), nearly a third of Ethiopian women aged 15-49 were anaemic with 17 percent mildly anaemic, 8 percent moderately anaemic, and just over 1 percent severely anaemic.

Low maternal body mass index is a risk factor for intrauterine growth restriction which may lead to other perinatal conditions (23). Over a quart6er of Ethiopian women were chronically malnourished (BMI less than 18.5), with more rural women suffering such undernourishment (28 percent) than in urban areas (19 percent) (2). There has been no improvement over the past decade: the EDHS 2000 reported 30% of women with BMI < 18.5, 32% in rural areas and 23% in urban areas (12).

Infection

Ethiopian women 15-49 years of age had a HIV prevalence of nearly 2 percent while for men of the same age, it was just less than 1 percent (2).

Among women who received antenatal care at a health facility and especially among the few who delivered with a health professional in the three years prior to the 2005 EDHS, HIV rates were higher (4 percent and 10 percent, respectively) (2).

In Addis Ababa between 1995 and 2003 HIV prevalence among pregnant women attending antenatal clinics declined from 21% to 13% (26), Possibly due to a parallel decline in active syphilis (27). An HIV decline was also reported from the University of Gonder Teaching Hospital where the present prevalence of 9.6% of pregnant women is lower than the 14% reported in 2003 (28). Given that the HIV/AIDS status in no generally known among the Ethiopian population, let alone among pregnant women and women who die during the maternal period, the contribution of HIV/AIDS to maternal mortality in Ethiopia in not known. Similarly, the burden of malaria in pregnant women and its contribution to maternal death could be high, given high fertility and 68% of the population living in malaria endemic areas, but remains unknown (PATH personal communication).

Indicator 2- increase the proportion of births attended by skilled health personnel

Rates of use of professional birth attendants

Ethiopia remains a country with most women outside of health services at the crucial time of delivery. During 2000-2005 when the MMR Was an estimated 673, only6 6% of delivering

women used a health professional for birthing, 28% used a traditional birth attendant and the vast majority (61%)were at home with relatives/others; 5% were alone (2). If women did use professional care, it was in facilities: 6% of births were in facilities (5% public and 1% private; 43% in urban areas and 2% in rural areas) (2). In the six years prior to 2000, as reflected in the 2000 EDHS, the rate of facility use was about 5% (see Figures la and b) (12). Predictors of use of professional care at birth include urban residence, wealthy and educated, as well as first birth. Of the expected 2.8 million deliveries a year in 2005 (1), 2.7 million were likely to occur at home with assistance of TBAs, relatives or alone.

Figure la. Assisted delivery in urban areas of Ethiopia in 1995-2000 912; n=1277) and 2000-2005, (2; n=815)

Supporting data for Figure la. Assistance during delivery for urban areas, Ethiopia 1995-2000

Person Providing assistance during delivery					
		Health Professional (%)	TBA (%)	Relative/other	No one
Urban residence					
	1995-2000	34.5	37.2		
	2000-2005	44.6	22.9		

Caesarean section rates

In 2005, only 1% of deliveries were by caesarean section, primarily for the least poor, well-educated urban woman (2). In rural areas, the rate was 0.3% (2) was below the 1% level needed to reduce maternal mortality from absolute maternal indications (29).

Use of antenatal care

There was virtually no progress between 2000 and 2005 in use of antenatal care (ANC) provided by a health professional- the

proportion of women who had at least one ANC consultation was 27% in 2000 and 28% in 2005 (although the EDHS 2005 does not some regional changes). Only 12% of women made the four or more visits recommended by WHO.

Supporting data for Figure 1b. Assistance during delivery for rural areas, Ethiopia 1995-2000 and 2000-2005

	Person Providing assistance during delivery			
	Health Professional (%)	TBA (%)	Relative/other (%)	No one (%)
Urban residence				
1995-2000	2.3	29.7	62.1	5.8
2000-2005	2.6	28.5	62.9	5.8

Women in rural areas were most deprived: three of four rural women remained without any antenatal care, and only 8% made four visits. Area of residence (e.g., urban), socioeconomic status (e.g., highest wealth quintile), higher education of mother, lower parity, married status, and religious affiliation (e.g., nonbelief in traditional religion) (30) were significant predictors for seeking ANC, as well as distance to the nearest health center (31) and quality of care received (e.g., iron tablets, information re pregnancy complications) (2).

One component of antenatal care, neonatal tetanus protection, did improve over time. The EDHS of 2005 reported that last births were protected against neonatal tetanus for 28% of pregnant women, with younger women and those with lower order births (3 and below) slightly more likely to have protection compared with their older or higher order counterparts; those who were the richest and most educated also showed an advantage in level of protection. This was an improvement over the 17% of pregnant women who had received the two injections required for protection in their last birth reported in the 2000 EDHS, although these percentages are difficult to compare given

varying methods of calculation in the two surveys.

Use of postpartum care

It is assumed that if there is a skilled attendant at birth, s/he would attend to immediate postpartum problems but at 6% use of skilled birth attendance; most women are outside such care. Use of postpartum care with a skilled care provider for women outside of professional birthing care remains very limited – 5.5% during 2001-2005, 5% within the first 48 hours after birth (2).

Barriers and facilitators to increased uptake of maternity services

Predictors of use and perceived barriers

In the EDHS 2005, 81% of women stated that they did not seek medical care for birth because of their concern that there would be no provider. About 7 of every 100 women stated that money required for treatment, no female health provider, lack of transport, and no one to complete household chores were major issues for them. For 6 of every 10 women distance to a health facility and not wanting to go alone were perceived as problems. Only a third perceived permission to go for treatment as problematic (2). However, in one rural study in Butajira using both qualitative and quantitative means, the decision to seek care for any woman's health problem was found to be highly dependent on the husband's decision (89.3%), and facility care would only be sought after traditional means of help in the woman's immediate area had been exhausted (32)

Other studies have noted that poor provider attitude, including harassment, and lack of attention to women's complaints, and lack of follow up in labor, were deterrents to use of delivery services (33); that women perceive health providers as insensitive and unduly harsh specifically if they come late for care or their clothing is 'dirty' (32); the providers are also felt to be unresponsive to community beliefs and practices (34); some even slap the women (32); In one rural area, women felt that young health workers were inexperienced and were 'simply practicing on us' (32). Delivery procedures in particular were perceived by women as alien and unnatural, and act as a significant deterrent to facility births. Referral may be seen as a measure of incompetence and only exacerbates existing suspicion of incompetence and inefficiency of both health facilities and providers (34).

A qualitative study, Safe Motherhood Community based survey (2006), found that gender dynamic governed decision making and resources with regard to care seeking, with

community the first and primary site of care (34).

The desire for community control influenced the timing of referrals and played into the attribution to evil spirits for poor outcomes in the community rather than to local traditional providers.

In contrast to delivery which is seen as the highest risk period, pregnancy is perceived as low risk for the mother and more focused on the focus, and hence use of antenatal care remains low while tetanus toxoid injections (although still only received by a third of women) are sought for their perceived benefit to the baby and to insure against prolonged or complicated delivery (34).

With the exception of the immediate post delivery period when bleeding and retained placenta are linked with the high-risk delivery, the remainder of the postpartum period is viewed also as low risk for mothers but high risk for newborns, especially from malevolent spirits. To guard both, the 40-day rule for home confinement is commonly observed (34), virtually ensuring low use of any outside care.

Supply side barriers

Reports of these projects that aimed to improve access and use of Emergency Obstetric Care (EmOC) SERVICES CARRIED OUT AT THE END OF THE 1990s and early 2000s provide testimony to the gaps in infrastructure and service practice and the difficulty in making progress in such environments (33,35,36).

Both the 199 FIGO save the Mothers Project (35) and CARE's FEMME project (36) found shortage or absence of trained manpower at all levels, including staffing shortages and turnovers among midwives and health assistants in the labor ward, knowledge and skill gaps among service providers, inconsistency of available blood, shortages of essential drugs and supplies and lack of medical equipment, and an ineffective referral system.

Evaluations of these projects continued to emphasize some of the barriers they started with facility infrastructure and human resources for maternal health care at skilled birth attendant and specialist levels being key gaps. Beyond these deficits, the projects signaled quality of care issues, in both personal interaction as well as skills, that need attention but which are otherwise undocumented.

Cultural barriers to increased use of skilled care remain substantial (e.g., late recognition of danger signs and decision making, communi8ty ownership), along with barriers

due to distance (e.g., transport, costs). The variability of cultural and geographical barriers through this highly diverse country however demands localized solutions. This requires building local knowledge to ground such solutions as well as the local infrastructure to respond and monitor progress.

In response, the Federal Ministry of Health of Ethiopia has instituted a vision with strategies beginning at community level. In 2003, the government initiated the Health extension program (HEP) in 2003 as part of the health sector Development Program (HSDP) to improve equitable access to preventive, promotive and select curative health interventions through paid community level health extension workers (HEWs), including delivery care at the household level. But while the Government's target of two HEWs per Kebele for a total of over 30,000 HEWs has been reached, the 2015 MDG target for the MMR, 218, remains difficult to accomplish. The HSDP has set a target of 32% use of skilled birth attendant by 2010 but only about 12% use was found in a 2009 survey of the four most populated regions of the country, plus 4% use of HEWs, (41). Even with some use of HEWs for birthing, HEWs have minimal training and virtually no hands on training in skills needed for normal birthing. They also have very little knowledge or skills in the first aid needed to stabilize a woman for referral.

The HEWS are also occupied with a variety of other tasks that require their time and for which they are likely better prepared, including house hold and community visits for health promotion efforts focused primarily on hygiene and sanitation activities. Obstetric and new born referral support for the HEWs remains minimal: there are few specialists or even trained midwives accessible especially to rural women. Even so, the HEP provides opportunities to improve maternal health through promotion of family planning, application of misoprostol for active management of third stage of labor, immediate postpartum visits to ensure both mother and newborn are doing well and breast feeding is well established, and improved referral through coordination from community to health center or hospital level if they are not well.

It is anticipated that the increase in provision of such efforts will move Ethiopia closer and more rapidly to the MDG 5 goal of improved maternal health.

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