Final report 2015-2020

Life-saving skills and subspecialty trainings in Gondar, Ethiopia; 5 years of collaboration

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on behalf of the Working Party International Safe Motherhood & Reproductive Health

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Introduction

Ethiopia is situated in Eastern Africa and bordered by six countries: North and South Sudan, Eritrea, Djibouti, Somalia, and Kenya. In 2015 the country counted almost 101 million inhabitants, living in density of 101 inhabitants/km2 (1). Maternal mortality ratio was 446/100.000 live births (2), neonatal mortality 30.7/1000 live births (3), effective ANC coverage rate around 22% (4), SBA 15.5% (5) and institutional delivery rate 26% (2016) (6). At time of writing this report, the population has increased till about 115 million and maternal mortality ratio has reduced till 401/100.000 live births (2017).

As a response to the high maternal and neonatal mortality and low skilled birth attendance, World Vision Netherlands invited the Working Party International Safe Motherhood and Reproductive Health (WP ISM & RH) to get involved in improving the maternal and neonatal care in Amhara Region in Ethiopia; more specific in Dembia District and Gondar town. The WP ISM&RH is part of the Dutch Society of Obstetrics and Gynecology (NVOG) and the Dutch Society for Tropical Medicine and International Health (NVTG) and aims to improve reproductive health of women globally by collaborating with local stakeholders and health workers.

The request from World Vision Netherlands resulted in an exploratory visit to Gondar University Hospital in 2014 and in 2015 the first Life Saving Skills (LSS) training was conducted. This training was chosen since members of the WP ISM & RH were acquainted with this training: they joined this training program in Tanzania in 2007. Aim of the LSS training, which is developed by the Liverpool School of Tropical Medicine (LSTM), is to reduce maternal and neonatal mortality. In several studies in sub-Saharan Africa it was proven that the LSS training improves knowledge and skills of local health workers to treat potentially life-threatening complications (7–9). In a multi-country longitudinal study, which evaluated the results of pre- and post-tests on knowledge and skills every 3 months up to 12 months after the training, it was shown that both knowledge and skills significant improved immediately after the training and health workers kept knowledge and skills till 12 months after the training (7). It was stressed that attending all four repeat skills-training sessions gave significant better retention of skills than attending only one or two re-assessments.

After the initial training in Gondar in June 2015, a Memorandum of Understanding (MoU) was signed. Collaborating partners were Gondar University Hospital, World Vision Ethiopia, Liverpool School of Tropical Medicine and the Working Party of International Safe Motherhood and Reproductive Health. This MoU was the start of a 5-year collaboration to improve the acute maternal and neonatal care in Dembia District and Gondar town. Aim of this collaboration was to conduct LSS trainings for both midwifes from the local health centers and midwifes and doctors from Gondar University Hospital (GUH) to improve knowledge and skills around emergency obstetric and neonatal care (EmONC). Initially the project was supported by a small grant of Share-Net; World Vision Ethiopia and the Working Party ISM&RH ensured funding at later stage.

In addition to this EmONC collaboration, exploratory supervision started on subspecialties as requested by the gynecologists from GUH. This supervision concerned oncology, urogynecology and fetomaternal medicine. Summaries of the reports of the three involved Dutch specialists are included in this report, as well as their personal future perspectives on the subspecialty trainings. Laparoscopic supervision was requested as well, however this was not in line with the primary objective of the WP ISM&RH and was not further explored.

Results of the LSS trainings

Seven LSS trainings were conducted between 2015 and 2020. Six of these trainings were conducted in Gondar and one training was given in Akesta, a town in South-Wollo zone, positioned around 500km South-East from Gondar. In 2015 the training was fully organized and given by expats, but as the result of training of trainers (ToT) and supervision activities of members of the WP ISM & RH, a group of 19 local trainers including two Ethiopian course directors was formed during the 5-year period. During the last two trainings, the WP ISM & RH only performed quality control and supervisory tasks.

In 2016 protests and demonstrations due to dissatisfaction of opposition groups about unfair distribution of wealth and political disregard of the rights and needs of rural people, gave insecurity in the specific regions including Gondar in Amhara Region. Negative travel advises from the Dutch Ministry of Foreign

Affairs resulted in a delay of visits to Gondar and the LSS trainings; two trainings were cancelled and only in September 2017 the trainings could proceed. Despite this interruption, the collaboration has shown to be strong enough to continue afterwards. The 25th Anniversary Symposium of the WP ISM & RH was organised the 1st of December 2017, attributing the morning session to this collaboration.

Capacity building

Trainees

203 people were trained: 140 midwifes from the health centers (35 from Dembia district and 105 from North Gondar Zone) and 63 gynecologists, residents and midwifes from Gondar University Hospital. During every LSS training, potential trainers were selected among the trainees. They were invited to join the ToT during the next visit and to participate as trainer in the following trainings.

Trainers

19 trainers were trained, both doctors and midwifes from GUH. It was learned that the midwifes were the most stable factor in terms of availability. These midwife-trainers were able to join the trainings repeatedly, which had positive influence on their skills as trainers during the skills-stations. Some lectures were given by midwifes, but the available gynecologists and residents gave most of the lectures and ensured quality of medical content at scientific level during the skills sessions.

Course Directorship

At first, course directorship was done by Dr Charles Ameh from LSTM in 2015. Hereafter, dr. Myrrith Hulsbergen took over, member of the WP ISM&RH and project leader of this collaboration. This course directorship was handed over stepwise under direct supervision, whereby Dr Dawit Kassahun designated as course director with midwife Kifle Yohannes as course coordinator in 2018. To improve continuity, Kifle Yohannes was designated as course director as well in January 2020.

Quality Control

While the training was handed over to the national trainers, quality control was performed by two members of the Working Party: Prof. Dr. Jelle Stekelenburg and dr. Mimosa Bruinooge. Quality control was necessary to ensure the quality standards of the training as expected by the LSTM and was performed with the official Quality Assurance Tool. Scores were given on quality of the presentations, quality of skill-stations, preparation of the venue and many more items. After every training, all quality results were sent to the LSTM for further evaluation.

Health center visits

Three visits of health centers - being run by LSS-trained midwifes - were undertaken from 2015 to 2017. Despite the organization and preparation of these visits by World Vision and the availability of gynecologists from GUH, the health center midwifes were either not present at the health facility or had been replaced. As a result, interviews could not be done, and skills could not be practiced.
Due to the unstable political situation in the region as described and the disappointing results of the first three visits, health center visits were discontinued, being cancelled by World Vision and GUH. So, the retention of knowledge could not be assessed as previously described in the multi-country longitudinal study of Ameh (7).

Test results before and immediately after the LSS training

Testing was done right before and immediately after the LSS training, to be able to evaluate the change in knowledge and skills.

Knowledge

Knowledge tests concerned the following topics: general knowledge, postpartum hemorrhage (PPH), fitting in pregnancy, preventing obstructed labour and assisted vaginal delivery. Test results were expressed in

false answers given. The graphs in annex 1 show the average score of false answers per trainee at all trainings during the period of collaboration.
From 2015-2020 between 189 and 196 trainees were tested before and after the training on the topics postpartum hemorrhage (N = 189 and 195), fitting in pregnancy (N = 190 and 196), and preventing obstructed labour (N = 187 and 196). Around 135 trainees (N = 131 and 139) were tested on assisted vaginal delivery and general knowledge was tested in 105 before and 111 trainees after the training. Differences in number of trainees tested were the result of the late arrival of some trainees. Also, the national course directors found assisted vaginal delivery not useful enough for health center midwifes so decided to take this test out of the LSS program during the last two trainings, and let people spend more time on the other tests. Results of the tests are presented in the graphs below and show a strong reduction of false answers immediately after the training, which can be translated in an improvement of knowledge on all topics. The results from 2015-2020 seem to be stable over the years. In the tests on "PPH" and "preventing obstructed labour", the post-tests results seem to be slightly improving over the years. Reasons have not been evaluated, but could be better knowledge beforehand, better motivation during the training or an improvement of the quality of the training itself. Results on "fitting in pregnancy" and "general knowledge" were constant in time.

Skills

Skills which were tested included 1) the performance of manual vacuum aspiration (MVA), 2) neonatal resuscitation and 3) breech delivery. Each trainee was tested on two of these three topics, whereby MVA was always tested, and the neonatal resuscitation and breech delivery exams were divided amongst the group. Each trainee was tested on the same two topics before and after the training.
187 and 199 trainees were tested on MVA before and after the training, 100 and 103 on neonatal resuscitation and 98 and 99 on breech delivery. Results of the tests are presented in the graphs in annex 2. The average score for every trainee is described for the year in which the training was conducted. The results show an improvement of test score immediately after the training for all three skills. The results seem to be constant in time during the 5-year period of this training program.

Satisfaction of the participating trainees

Trainees were requested to evaluate the training in general, the lectures and the skills sessions. In general, they showed high satisfaction. Most elements of the training were evaluated as (very) useful, some parts were evaluated as neutral, and very rarely someone evaluated a lecture or session as not useful. It was discussed with the trainers to give more attention and preparation to the sessions with negative evaluation.

Written quotes were always positive:

"Was so very interactive, continue like this"

"No comments, was very nice"

"The training time is very short, please extend to seven days i.e. add for three days"

"The trainers are very good"

"Keep the training for the other staff for better outcome. Please add the time"

"I'm Happy so Much!"

Satisfaction of the trainers and course directors

Feedback was requested from the trainers and course directors. Feedback was positive on teamwork, commitment, friendly environment and knowledge of the trainers themselves. During the five years of collaboration, the comments became more outspoken and even more positive.

The challenges that were highlighted by the trainers and course directors were: time-management, quality of equipment, language (training materials were in English language), the preparation of the trainers beforehand, distraction by other commitments in work and private, follow-up of trainees by mentoring midwifes in the health centers, contextualization of the training materials to the Ethiopian context and per diem for the trainers. Some of these challenges seemed to improve over time, like time-management, preparation and contact with midwifes in the health centers by initiatives of the national trainers. Other challenges remained.

Data from Gondar University Hospital

In this paragraph, maternal and neonatal mortality data are described by Kifle Yohannes from Gondar University Hospital. Maternal mortality ratio (MMR) and caesarean section rate (CS rate) were calculated by the author of this report. Data on referrals, indications and outcome could not be retrieved at GUH. No explanation could be given on the neonatal death numbers in GUH.

Health Indicators					
	2015	**2016**	**2017**	**2018**	**2019**
Maternal deaths	11	10	13	14	9
Neonatal deaths	73	37	157	234	268
Still births	170	176	213	226	305
Total number of deliveries	8,075	8,834	9,289	9, 437	12,231
Spontaneous vaginal deliveries (SVD)	5,821	7,015	7,483	7,590	9,828
Caesarean deliveries (CS)	2,254	1,819	1,806	1,847	2,403
Maternal mortality ratio (MMR) (Mat deaths/100.000 live births)	139	116	143	152	75
CS rate (SC/total number of deliveries)	27.9%	20.6%	19,4%	19.6%	19.6%

Data from World Vision

Accurate data from Dembia Region are not available. Some reasons mentioned by Mihretu Sisay from World Vision Ethiopia are the demolishment of the World Vision office in 2016-2017 and the leave of trained health workers due to promotion or due to family matters. According to Mihretu Sisay, the unpublished district health report showed that the numbers of pregnant mother referred from health

centre to hospital has been reduced and the unpublished annual management report of Dembia Area program shows that the number of skilled delivery increased from 50% (2015/16) to 82% (2018/19). No neonatal death was registered, and maternal mortality decreased from 3 in 2015 G.C to 1 in 2019 G.C. Numbers of pregnant mother referred to hospital decrease from 306 (in 2015 G.C) to 120 (in 2019 G.C) from health centres according to the Dembia district health office.

One of the midwifes from Ayimba Health Center quoted:

"Most of the time I wrote many referral papers for those pregnant mothers who has any kind of danger sign symptoms. Many of mothers faced shortage of transportation like ambulance; faced shortage of money; and complication on their ways to hospital. Lack of knowledge, skills, trust, and confidence made me to refer to hospital but now I have equipped with the necessary knowledge & skill to manage cases during delivery except some cases. So, I am now confident thanks to those who gave me the training to help these mothers. I am glad because many of the mothers are poor; illiterate; victims of harmful traditional practice; get no or less support from the community. These people deserved my support and I can do it".

Projects, manuscripts and publications

This international collaboration resulted in several projects, manuscripts and publications.

Projects

1 Research Project for master's degree in medicine, Marieke Meulenbeld 2016. Thesis: "Evaluation of introducing a training in Emergency obstetric and newborn care in Gondar, Ethiopia".
2 Research Project Mimosa Bruinooge and Linda Barry, 2015. Title: "Quality of maternal health Care Service in Northern Ethiopia: what does the midwife think of it?"

Manuscripts

1 Evaluation of emergency obstetric and new-born care training in Gondar, Ethiopia; a mix methods study. Marieke Meulenbeld, Sabine van Nievelt, Birhanu Ayana, Mulat Adefris, Dawit Kassahun, Charles Ameh, Myrrith Hulsbergen, Mimosa Bruinooge, Jelle Stekelenburg, Marcus J. Rijken *(in progress)*
2 Quality of maternal health care service in Northern Ethiopia: what does the midwife think of it? Mimosa A.P. Bruinooge, Linda Barry, Genet Gebremedhin, Tigist Mamo, Longina Jakubowska, Birhanu Ayana, Myrrith Hulsbergen, Jelle Stekelenburg, Marcus J. Rijken *(in progress)*

Publications

1 The right to safe motherhood: taking stock and looking forward, M.H Hulsbergen, J. Stekelenburg, Medicus Tropicus Sept 03, 2017, editorial.
2 Collaboration to improve women's health in Gondar region, Ethiopia, B. Ayana, M.H. Hulsbergen, Medicus Tropicus Sept 03, 2017, 21-22.

Funding

This project was awarded for the Share-Net Small Grant of 23.000 euro in 2015, ensuring the first two years of trainings.
In 2017 a benefit dinner with Prof Jelle Stekelenburg was organized in Leeuwarden, the Netherlands. This resulted in additional funding of 25.999,47 euro.
Due to these substantial amounts, international trainers could travel to Gondar, national trainers were paid and other expenses like necessary training materials could be covered.

Results of the subspecialty supervision and training visits

This paragraph gives an overview of the subspecialty visits undertaken by three subspecialists from the working party.

Gynecologic oncology

In June 2015 and September 2017, Dr. Heleen van Beekhuizen visited GUH to join the gynecologic oncology fellows and gynecologists for supervision and lecturing.

Two gynecologists were trained as sub-specialists in gynecological oncology during the 5-year period of the collaboration. A gynecologic oncologist from Leipzig University made 6 monthly visits to GU for supervision and on the job training, but she did not give lectures. Heleen worked with the fellows only once since they were studying for their fellowship exams during the second visit.

In Gondar -like many sub-Saharan African countries- cancer of the cervix is a major problem. Mortality of cervical cancer is exceeding maternal mortality. In early detection, surgery (radical hysterectomy) is possible. When detected late, only (chemo)radiotherapy is a curative option.
The cervical cancer screening unit is in the gynecology outpatient clinic, founded by an American gynecologist who has been in Gondar for almost a year. This screening unit begins to run well. Many women are diagnosed with cervical cancer, mostly high stage carcinoma, and are referred to Addis Ababa for radiation therapy. The waiting list in Addis is six months and many patients do not have funding for travel and accommodation costs.

In Gondar University Hospital, gynecologic oncology surgery is performed in the operating theater of the fistula hospital. This is an adequate location but needs some improvement, especially in terms of light, electricity & instruments. To support this, during the second visit Dr van Beekhuizen supplied the team with a complete radical hysterectomy surgical tray. The theatre is well equipped: four brand new laparoscopy units are in place but not in use yet due to lack of skills in surgery and maintenance of equipment. Currently a radiotherapy bunker is built.

During the two visits Heleen gave lectures on the following topics: cervical cancer, trophoblastic tumors, and palliative care. She performed surgery with the sub-specialists during the first visit and was happy with their skills. Since they were being trained to become gynecologic oncologists afterwards, she presumes that their skills are now upon standards. At the second visit no patients were asked to come for surgery.

Future perspectives from Dr Heleen van Beekhuizen:

Since no request for cooperation followed the last visit, the collaboration is ended for now. Heleen is happy to cooperate on cervical cancer prevention and treatment and start of palliative care (for cancer patients) upon request. Challenges for the future are HPV vaccination, improving and extension of screening, palliative care, starting of the radiotherapy unit and multidisciplinary meetings. However, Heleen sees challenges for cooperation: multiple donors and NGO's are involved in GUH. Requests for cooperation are sometimes more donor driven than requested by the Ethiopian counterpart. A long-term plan should be made when further cooperation is requested, especially on cervical cancer prevention, screening and treatment.

Urogynecology

In 2018, Dr Mark Vierhout visited GUH for the period of one month.
Dr Vierhout believed that, because in general the urogynecological division of the department of O&G from the GUH was a well performing division within the limits of the setting of a developing country, it was among the top 10% of uro-gynaecological expertise in Ethiopia and had the ambition of becoming a centre of excellence within the region and possibly within Ethiopia. Supervision and coaching of the operative procedures from the present two urogynecologists seemed not a major goal since their skills were

adequate and supervision was given by Dr Anna Kiefer, a German gynecologist coming on regular basis to supervise and perform surgery.
Future perspectives from Dr Vierhout:
Dr Vierhout found that, if the WP wanted to invest in an already relatively strong division it would need several dedicated and experienced urogynecologists who would commit themselves for several years with a frequency of visiting GUH of at least once per year. Only then he recommended support in 1) setting up conservative treatment for pelvic floor dysfunctions (physiotherapy and pessary treatment), 2) upgrading residents' knowledge of pelvic floor dysfunctions, 3) setting up a structure to give residents sufficient and controllable expertise and dexterity in POP surgery, 4) setting up appropriate research projects preferably leading to one or more PhD trajects.
Until now, there has not been enough motivation from GUH site and dedicated manpower from the WP ISM & RH to be able to contribute to the above listed contributions. Also, the initiating gynecologist is not working at GUH anymore. As a result, the supervision has not continued.

Fetal maternal medicine

In 2020, Dr Harry Kragt visited GUH and trained during four weeks on fetal maternal medicine.
Four qualified gynaecologists namely Kiros Terefe, Yeshiwas Abebaw, Solomon Berhe and Chernet Baye took the lead in 2017 to improve their knowledge on fetal maternal (FM) medicine. Their curriculum contained a detailed overview of all aspects of a two-years training program on fetal maternal medicine at Gondar University Hospital. The training and lectures were provided by FM specialists from Assuta Hospital in Ashdod, Israel by periodical presence of a couple of weeks every trimester. The four fellows were not only trained in Ethiopia, Gondar. Solomon and Kiros were also trained on ultrasound in Halle (Germany), and Kiros in Asuta Hospital (Israel). To sustain a continuous education program, support was asked from the Dutch Working Party of International Safe Motherhood and Reproductive Health (WP ISM&RH) in April 2019. The WP ISM & RH agreed upon a visit for training and evaluation. Three two-year old ultrasound machines Sonoce X7 with colour doppler, power doppler, graphs and storage plugs were already present in Gondar University Hospital and formed the basis to improve ultrasound skills. Dr Kragt found that knowledge and skills were already at a pretty high level. Although the learning system of seeing and doing ultrasound performed by all levels of health workers (gynecologists, senior and junior residents and interns) was lacking, there was a mode of standardisation. It was proposed and agreed that a quality system should be developed to perform ultrasound following international standards. The International Society of Ultrasound in Obstetrics and Gynaecology (ISUOG) was introduced with their existing outreach program, was informed about the training in Gondar and the necessary information was forwarded.
In the meantime, Dr Kragt trained the fellows on basic level ultrasound investigations to improve their skills. Every day hands-on instructions were provided in an OPD room with the two ultrasound machines. Lectures were given by slideshows and one lecture was provided ISUOG on internet. Several subjects were taught amongst others, like basic training and several learning modules of the ISUOG, first trimester ultrasound, fetal anomalies, soft markers, fetal echocardiography, doppler, screening for vasa praevia and 3D ultrasound. Normal values of the PI UA, MCA were provided, as well as 20 volumes of the "Essential O+G guidelines" from M Breen, books on (doppler) ultrasound as well as all the slideshows of the given lectures.
Future perspectives from Dr Harry Kragt:
The future depends on the possible agreement of the ISUOG to become involved with GUH. It was speculated that the ISUOG would be able to provide an enormous help for the fellows by giving standardised lectures on ultrasound to residents (35) and intern (50). As Dr. Kiros is well advanced in his skills, he can train the other gynaecologists and residents after agreement of the ISUOG. Second phase will be to train other mid-level professionals like health officers, emergency officers and midwifes working in the 11 primary healthcare units, which units include one district Hospital, five health centers and 25 satellite health posts. Funding which is searched for by the fellows.
It can be stated that a fetal maternal specialist should function as a spider in a web. Within the hospital, close cooperation between residents, interns, midwives, and ultrasound assistants is needed but interdisciplinary meetings with radiologists, pediatricians, physicians, genetic counsellors, and neurosurgeons as well. Outside the hospital a network can be developed to cooperate with medical officers

in the 11 district hospitals around Gondar, which are already provided with new ultrasound equipment. A data collection system could be built up by connecting the US machines with a computer system.

Discussion and limitations of the LSS training

This five-year collaboration on Life Saving Skills trainings has resulted the training of 203 healthcare workers from GUH and surrounding health centers on emergency obstetric and neonatal care. Also, a group of 19 motivated national trainers has been established. This group of trainers is able to organize the LSS training and transfer the knowledge necessary to improve maternal and neonatal care. This great achievement was due to efforts of the collaborating partners and could be accomplished within 5 years despite the cancellation of two trainings due to security reasons. Improvement of all different knowledge and skills tests immediately after the training has been shown, and feedback of the trainees and trainers were overall positive.

Many initiatives to improve health and healthcare have impact on maternal and neonatal health indicators, and several organizations in Gondar and surroundings try to make a change by their running projects. This means that possible improvements on maternal and neonatal morbidity and mortality cannot be solely attributed to the LSS training. But, hospital data on referrals, indications and outcome could not be retrieved at Gondar University Hospital, and no explanation could be given on the increase in neonatal deaths. Also, data from World Vision did not seem to be accurate.
Looking at the evidence from the LSS training in general, we believe that this project has its own impact on the maternal morbidity and mortality and needs to be continued in the future. Since accurate data collection is obligatory to be able to show results of running programs and to request funding, this will hopefully be a drive for the national partners to improve data collection and monitoring in the future.

Outcome of the given trainings, except the change of knowledge and skills immediately after the training, could not be measured due to the failure of (quality) follow-up visits of the health centers with direct supervision, extra skill-training, follow-up of statistical data and interviews. Challenges were communication, replacement of midwifes to different HC, absence of midwifes at the day of follow-up, security problems in Ethiopia and financial means. As a result, the long-term results of the LSS training in the health centers could not be measured during the 5 years of collaboration. However, evidence on the LSS trainings from the LSTM is known, as described in the introduction.

Quality of this training depends on trainer's quality, availability of equipment, preparation and motivation of the trainees including time-management. With the ToT, 19 trainers have been trained. The quality of teaching has shown strong improvements over the past years. However, cultural differences between the collaborating parties and the need to perform other tasks in the hospital during the training, give difficulties in timing and preparation of the training. This issue has been discussed often but needs to be addressed in the future as well, to ensure a continuous improvement of quality.

The financial drive for the trainers to join the training continues to give disappointment about financial allowances despite earlier agreements. This gives rise to the need for even more clear agreements about the amount to be paid per day, the required availability of trainers during the full course and the payment structure (cash or bank-transfer). It is suggested that the WP ISM & RH should not be responsible for payment of allowances but purely deliver knowledge and skills.

Also, this period gave rise to several subspecialty visits in gynecologic oncology, urogynecology and fetal maternal medicine. The last subspecialty visit has resulted in the initiative to connect Gondar University Hospiral to an acknowledged training by the Society of Ultrasound in Obstetrics and Gynaecology.

Future perspectives

The project has given a strong bond between the different partners, which can be used to develop future collaboration plans. The two local stakeholders World Vision Ethiopia and Gondar University Hospital,

together with the WP ISM & RH, believe in the strength of this program. The importance to continue these trainings in the future has been pointed out by all parties during the last visit in January 2020. However, to ensure sustainability of this training program several factors are important:
First, the two local partners WV Ethiopia and GUH need to take ownership and show willingness to continue to organize trainings and re-start follow-up visits whereby clinical support and skills testing can be performed till at least 12 months following the initial training. A collaboration with the midwifery association might be an option but needs to be explored. During the last training in January 2020, this has been shortly discussed.
Second, quality of the training needs to be ensured. The two national course directors are invited to join one LSS training organized by the LSTM in Kenya to improve their skills in course directorship. This will be funded by the WP ISM & RH. The WP ISM & RH can support the attendance of one WP member for quality control during the next two trainings and might be able to support the purchase of necessary equipment.
Third, a sustainable local financial system needs to be established to pay trainer fees, replacement of equipment and allowances for trainees. During writing of this report, a project proposal for continuation is being written by the GUH team, to request for further support to ensure continuation of the project.
Fourth and most important, the local partners need to take responsibility to continue with this program, without the WP ISM & RH as initiating partner.

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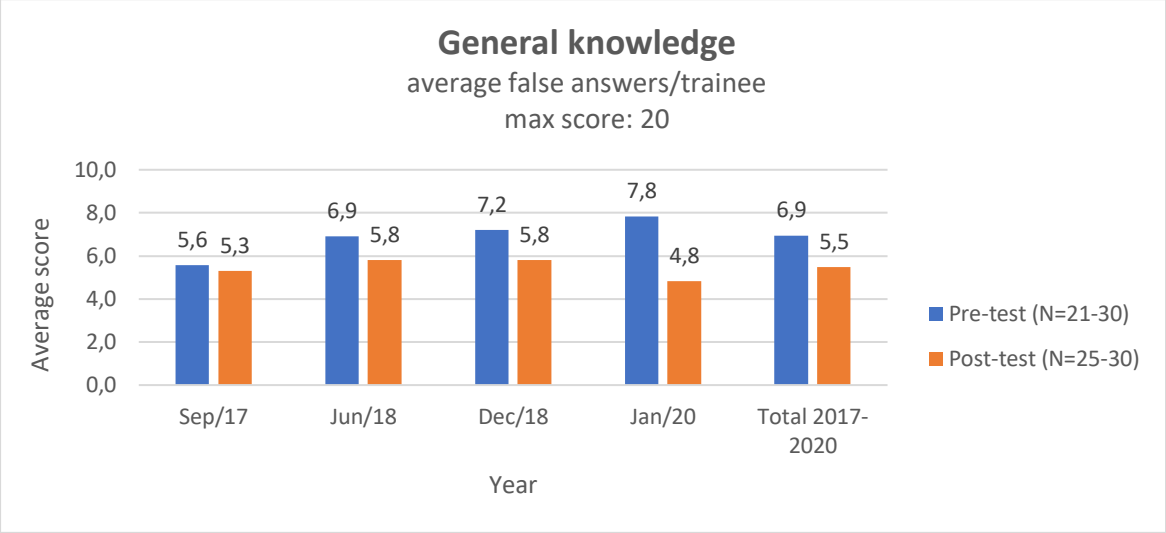
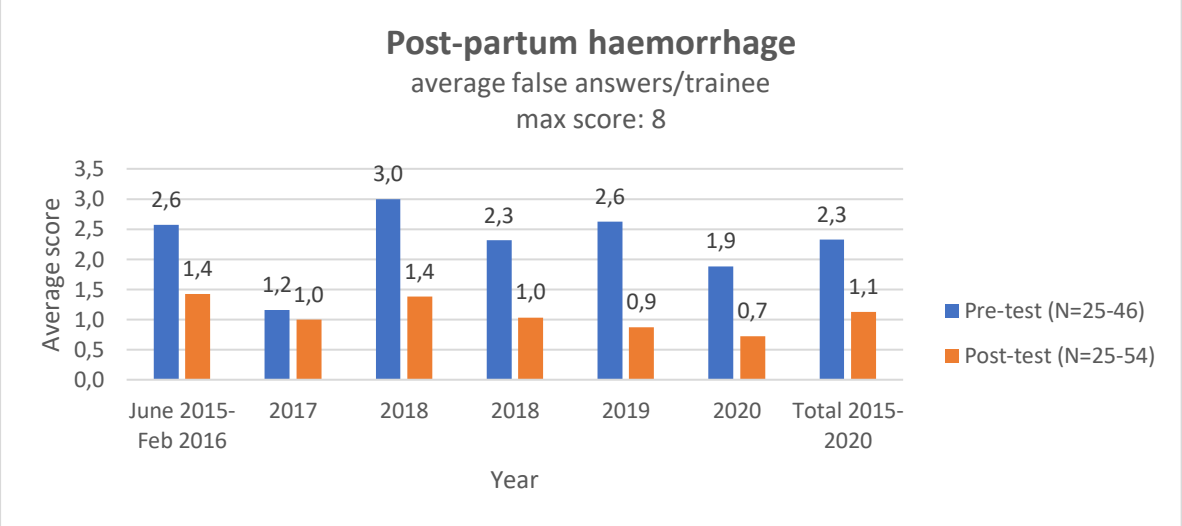
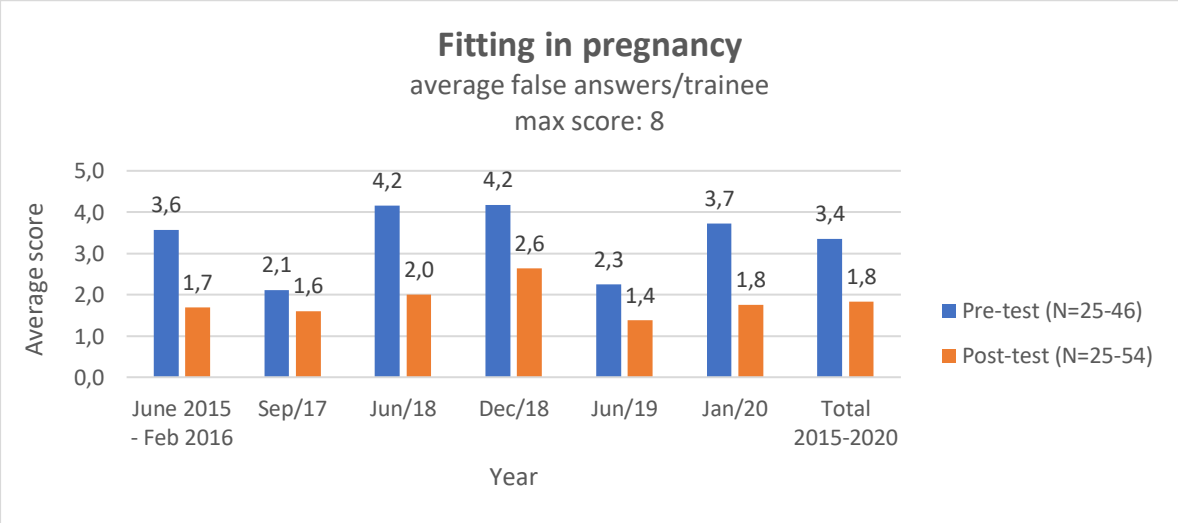
References

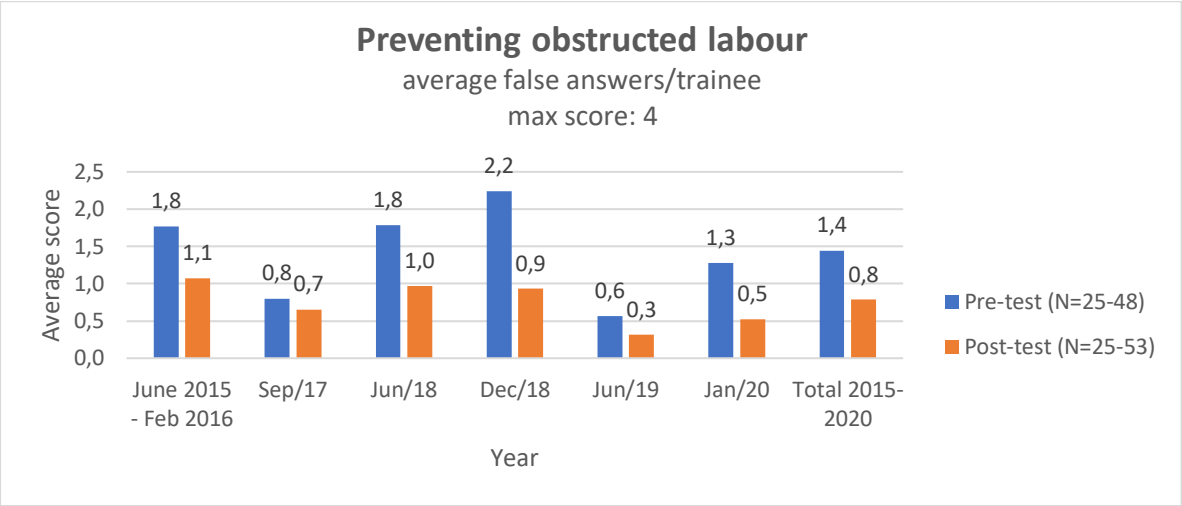
1. Worldometer. Population Ethiopia.
2. The Worldbank Group. MMR ethiopia [Internet]. 2019. Available from: https://data.worldbank.org/indicator/SH.STA.MMRT?locations=ET
3. The Worldbank Group. Neonatal mortality Ethiopia [Internet]. 2019. Available from: https://data.worldbank.org/indicator/SH.DYN.NMRT?locations=ET),
4. Yakob B, Gage A, Nigatu TG, Hurlburt S, Hagos S, Dinsa G, et al. Low effective coverage of family planning and antenatal care services in Ethiopia. Int J Qual Heal Care. 2019;
5. The World Bank Group. Skilled birth attendance Ethiopia [Internet]. 2019. Available from: https://data.worldbank.org/indicator/SH.STA.BRTC.ZS?locations=ET
6. Central Statistical Agency Addis Ababa E. Ethiopia Demographic and Health Survey [Internet]. 2016. Available from: file:///C:/Users/mhhul/Desktop/Final report/DHS Ethiopia 2016.pdf
7. Ameh CA, White S, Dickinson F, Mdegela M, Madaj B, Van Den Broek N. Retention of knowledge and skills after Emergency Obstetric Care training: A multicountry longitudinal study. PLoS One. 2018;13(10):4–15.
8. Ameh CA, Kerr R, Madaj B, Mdegela M, Kana T, Jones S, et al. Knowledge and skills of healthcare providers in sub-Saharan Africa and Asia before and after competency-based training in emergency obstetric and early Newborn Care. PLoS One. 2016;11(12):1–14.
9. Ameh C, Adegoke A, Hofman J, Ismail FM, Ahmed FM, Van Den Broek N. The impact of emergency obstetric care training in Somaliland, Somalia. Int J Gynecol Obstet. 2012;117(3):283–7.

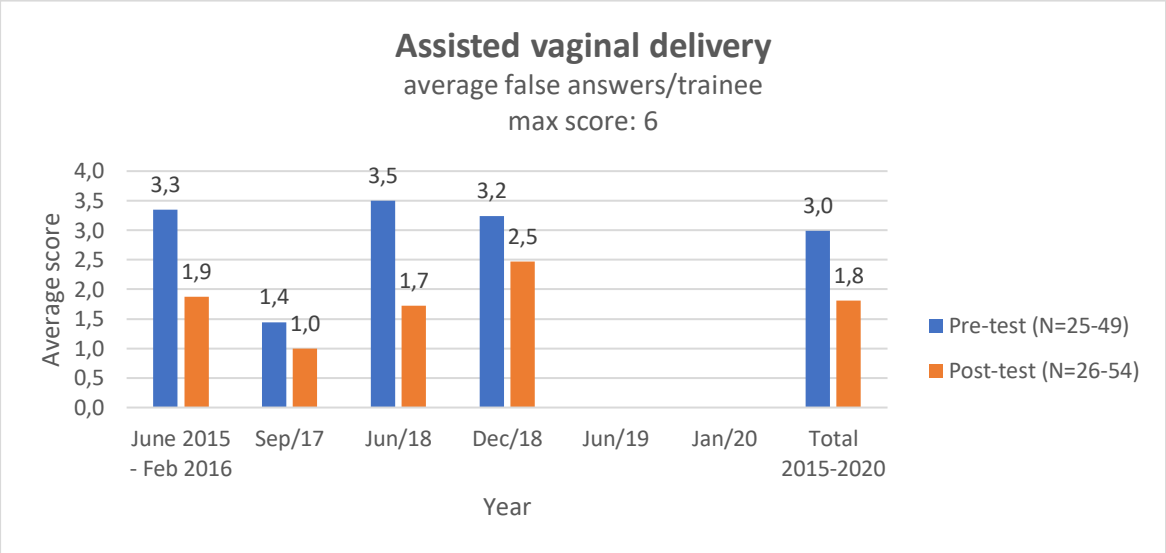
Annex 1: Knowledge tests








Preventing obstructed labour
average false answers/trainee
max score: 4
Average score
2,5
2,0
1,5
1,0
0,5
0,0
1,8
1,1
0,8
0,7
1,8
1,0
2,2
0,9
0,6
0,3
1,3
0,5
1,4
0,8
June 2015 - Feb 2016
Sep/17
Jun/18
Dec/18
Jun/19
Jan/20
Total 2015-2020
Year
Pre-test (N=25-48)
Post-test (N=25-53)


Assisted vaginal delivery
average false answers/trainee
max score: 6
Average score
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
3,3
1,9
1,4
1,0
3,5
1,7
3,2
2,5
3,0
1,8
June 2015 - Feb 2016
Sep/17
Jun/18
Dec/18
Jun/19
Jan/20
Total 2015-2020
Year
Pre-test (N=25-49)
Post-test (N=26-54)

Annex 2: Skills tests