A rapid assessment of utilization, effectiveness and added value of the knowledge centres at Bishoftu and Durame hospitals in Ethiopia

Mirkuzie Woldie Kerie (MD, MPH)
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Acknowledgements

I would like to extend my gratitude to Mr. Garumma Tolu Feyissa who has been of significant help particularly during data collection and transcription of the qualitative data. I have to also take this opportunity to thank all of the respondents who have given all the necessary information during data collection. I thank the Global Health Workforce Alliance for funding this assessment and World Health Organization for providing technical support.

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### Abbreviations

- **CEO**  Chief Executive Officer
- **EIA**  Environment Impact Assessment
- **FMOH**  Federal Ministry of Health
- **GHWA**  Global Health Workforce Alliance
- **GP**  General Practitioner
- **HIV**  Human immunodeficiency virus
- **HMIS**  Health Management Information System
- **IBP**  Implementing Best Practices
- **ICT**  Information Communication Technology
- **IT**  Information Technology
- **KC**  Knowledge Centre
- **KCs**  Knowledge Centres
- **OPD**  Out Patients Department
- **PC**  Personal computer
- **RHB**  Regional Health Bureau
- **SOP**  Standard Operating Procedures
- **TB**  Tuberculosis
- **WHO**  World Health Organization
- **ZHD**  Zonal Health Department
Executive Summary

Background: In 2010 the Federal Ministry of Health (FMOH) of Ethiopia in collaboration with the Global Health Workforce Alliance (the Alliance / the GHWA) and the World Health Organization (WHO) agreed to establish three pilot knowledge sharing and exchange centres, or simply knowledge centres (KCs). Funding of the project was mainly handled by the Alliance while WHO provided technical support. Two of these centers have already been functional for about two years and arrangements have been completed for a third one to be established soon. The KCs are meant to “contribute to the retention of an effective, responsive and equitably distributed health workforce” by improving access to up to date information for public health and clinical practice in hospitals of remote areas.

Objective: To explore the benefits and experiences gained since the introduction of the knowledge centres at Bishoftu and Durame hospitals in Ethiopia.

Methods: A case study of the two sites was performed using a mix of rapid assessment techniques which include in-depth interview, record review, observation and mini-survey among users. Participants in the interview included representatives of the hospitals, the FMOH and the WHO. The qualitative data was first transcribed word for word and analyzed using thematic framework approach. Descriptive statistical measures were generated after entering the quantitative data into computer software (SPSS V 14.0).

Key Findings:

- All of the users at the KC in Durame are the employees of the hospital the majority being the health workers. Similarly, users of the KC in Bishoftu are health workers of the hospital although those in the town health office and the health center were also using the services. Health extension workers or other members of the society are not using the services in both of the centers.

- The online services are much more preferred than the offline services by the users of both centers. The preference of the users might relate to the fact that online services provide access to general benefits of having internet connectivity such as e-mail and Facebook communications rather than access to technical materials per se. Consequently, about 60% of the users indicated that they used the online services for e-mail and facebook communications. It was noted that specific contents used by the users are dependent on the type of the professional.

- More than a quarter of the users interviewed visit the KC at least once per day while another 41.0% visit the center three or more times per week.

- Specific contents of the offline and online services were highly appreciated by the users and managers interviewed. However, additional technical contents on radiology, anesthesia, medical laboratory, gynecology/obstetrics, pediatrics and internal medicine were recommended to be included in the e-Granary by the users.

- The presence of the KCs in the hospitals has improved access to up to date information, through different literatures and reference materials, by the health professionals.
• All participants of the assessment claimed that the practice, motivation and satisfaction of the health workers in the hospital have improved since the establishment of the KCs. It was also found that the KCs have contributed in improving the ability of the hospitals to retain health workforce.

• The KCs have helped employees of the hospital to develop and maintain a reasonable level of computer and other IT skills.

• The establishment of one additional KC in Asossa is well under way and preparations have been completed.

• The computers available to the users at the KCs were found to be insufficient. This was particularly true since only few of the computers in both centers were functional with all offline and online services working.

• The training provided to the users and others was well appreciated by all of the participants although most felt that there is a need for additional training particularly to users and the IT focal persons. This was suggested since all computers supposed to be available to users are not having all services operating correctly all the time.

• The opening hours of the KCs was judged to be largely inconvenient by the users and representatives interviewed. Location of the KC in Durame was found to be convenient while it was not the case in Bishoftu. Availing the resources at the KCs at the different service areas of the hospital was suggested by respondents of both sites.

• Although registration sheets filled in by the users were witnessed at both sites, there was no any sign of regular reporting of the activities of the KC to the hospital or other authorities. The registration sheets filled in by the users are incomplete in significant portions of the form. This was mainly related to reluctance of the users to consistently and completely register the required information on the registration forms. It was also found that the KC has no any operational plan.

• There were regular supportive supervisions to the KCs initially. Currently, all respondents agreed that it has become irregular and based on reports of failure at the KCs.

• Other challenges reported from both sites include frequent interruption of the online services and power, frequent failure in the offline services particularly the e-Granary and delay in computer maintenance.
**Recommendations:**

From the main findings listed above it follows that the way forward in the scale up of the KC initiative should take note of the following recommendations:

- The hospital authorities and the supervision team have to be engaged in further awareness creation among hospital staff and others to ensure that the resources at the center are adequately utilized. Emphasis has to be given to the value of using the offline services by the health workers.

- Despite the challenges faced, all the stakeholders in this initiative have to note that the main goal of the initiative is being realized. This has to move the Ministry of health (MOH) at all levels (the hospitals, Regional Health Bureau and FMOH), the WHO and the hospital authorities to ensure availability of enough number of functional computers, functional state of the online and offline services at the centers, and continuous and regular supervision of the KCs.

- To address the issue of regular supervision availing adequately qualified Information Technology (IT) professionals at strategic location to serve a group of KCs is recommended for the scale up phase. Such arrangements as assigning qualified IT professionals in the zonal health departments (ZHDs)/ Regional Health Bureaus (RHBs) could minimize the physical barrier between the KCs and the supervisors.

- The hospital and the RHBs should also figure out means of employing adequately qualified IT professionals who can be trained to solve problems of networking and soft/hardware crushes at the KC since this has been a significant problem in both centers.

- The hospitals in collaboration with the RHBs and the local authorities have to create a means to ensure that the opening hours are made convenient to the health workers in the hospitals. This could particularly be realized by keeping the centers open during off duty hours by making the necessary arrangements.

- Users of the KCs need to understand the value of fully completing the registration sheets after using resources at the center. It might also be made a requirement to fill in the registration form at the beginning which means the user will only have to register the contents used and time elapsed before he/she leaves the center after use. More preferably, introduction of an electronic login mechanism which automatically registers all the necessary information every time the user logs in might be designed.

- The FMOH with technical assistance from the WHO should prepare standard operating procedure (SOP) and manual to facilitate operation and maintenance at the KCs.

- Based on the successes of the two centers in meeting the intended objectives to a significant degree, it is recommended that the FMOH and other stakeholders in Ethiopia should plan for the scale up of this initiative to other hospitals located in remote parts of the country.

- Similarly, the findings in this assessment imply that other countries with similar context may consider adapting this initiative to their existing circumstances possibly with the support of the Alliance and the WHO.
1. Introduction

In 2010, the Federal Ministry of Health (FMOH) of Ethiopia in collaboration with the Global Health Workforce Alliance (the Alliance / the GHWA) and the World Health Organization (WHO) undertook a project to establish three pilot knowledge sharing and exchange centres, or simply knowledge centres (KCs). The Ethiopian FMOH decided on the location of the sites namely; a) Bishoftu district hospital in Oromia regional state, b) Durame rural district hospital in Southern Nations and Nationalities state and; c) Assossa hospital in Benshabgul Gumuz state. By the end of 2010 two sites had been established i.e. Bishoftu and Durame, with the third site to be established in 2011. The funding of the project was mainly provided by the Alliance while WHO provided technical support.

The intent of the pilot project of knowledge centres was to develop a model serving as a platform for delivering knowledge services including *information, interactive discussions and training* through gateways for the health workers at the district and community levels. The KCs, furthermore, aimed at bringing new and innovative technologies in addressing health issues of importance for the health professionals and encourage the use of modern technologies in support of sharing of knowledge for creating a change in health care practices.

To that effect, health workers were to have access to the e-based resources through internet as well as off-line devices including the e-Granary. The information resources included documents, papers, guidelines, algorithms, standards and checklists on a number of topics related to medical care, public health, and best practices, etc. An initial training was given on the use of the technology, on how to search and access to the information.

An earlier rapid assessment by the Ethiopian FMOH in collaboration with the WHO Country Office found that implementation in the first two centres was progressing well in terms of delivery of the activities initially envisaged but didn't investigate the effects on health workers satisfaction, performance or retention, and made the following recommendations:

- Build capacities of the health information staff and other health workers: The national team to provide on-site training on the use of resources as well as basic skills on computer operations.
- Expand services within the facilities to ease access of resources to physicians and nurses’ duty rooms (internal networking). Provide additional computers and networking cables.
- Support the infrastructure to enhance the efficiency of reporting.
- Intensify regular supportive supervision to support proper implementation.

To further follow up the implementation of this initiative, a rapid assessment was planned to answer the following questions:

- Services availability and use by type of health workers - assess the extent to which health workers are accessing online and offline services and the E-illuminate service. Identify the specific resources that are being accessed. Assess if other persons and community members are using the services.
- Provide a quantitative estimate on number of health workers using services in a given period, e.g., monthly, and to what extent the health workers in the facilities are using the services (coverage of staff).
Identify which contents are most liked and used, which content is found unused and un-popular, and what additional content, if any, users would like to see. Do health workers feel they are comfortable and up to date with specific content relevant to their work?

Opening hours - how are these convenient and appropriate?

Source of information about the knowledge centers - how do health workers and members of the community get to know about the knowledge centers?

User friendliness and convenience in use of the resources - including equipment and amenities

Effect of knowledge centres on motivation, capacity and performance of health workers - what have been the perceived benefits to the health workers of the presence of the knowledge centres? What are the benefits perceived to the health facilities? Are health workers less likely to leave because of these KCs? Are these KCs acting as an added attraction to health workers to serve in a rural area?

What is the value, if any, of the KCs for research purposes for the health workers and other stakeholders such as academic institutions?

What capacity building has happened e.g., computer literacy, use of Information Communication Technology (ICT) facilities?

How could documentation and reporting at the KCs be improved?

Any suggestions on supportive supervision for the KCs and by who?

How this activity could be improved in the future and/or in other countries/ location in case of scale-up.

2. Objectives of the assessment

2.1 General objective

- To explore the benefits and added value of the knowledge centres at Bishoftu and Durame hospitals

2.2 Specific objectives

1. To assess the utilization of the knowledge centres by the health workforce at local levels
2. To assess effects or changes in health worker practices, satisfaction or performance, or delivery of health care that have been brought about due to the introduction of the knowledge centers,
3. To document experiences and lessons learnt since the introduction
4. To develop recommendations for an eventual expansion of a similar activity in other similar contexts,
5. To inform stakeholders on the progress made and chart a way forward.
3. Methods and materials

3.1 Assessment area and period
The rapid assessment was conducted during 20th December 2011 and 3rd January 2012. The assessment included two KCs located in Bishoftu and Durame hospitals.

3.2 Study design
A case study design was employed.

3.3 Participants
The study involved two KCs established in two hospitals, namely Bishoftu and Durame. In the assessment 39 users of the KCs and 8 representatives of the Ethiopian FMOH (2), WHO (2) and the hospitals (4) were interviewed.

3.4 Data collection instrument
Data was collected using in-depth interview guides, semi-structured questionnaire, and record’s review and observation checklists. The semi-structured questionnaire had open ended questions to let the users have the chance to give their opinions in detail. All of the instruments were prepared based on the objectives and assessment questions specified on the term of reference for the assessment.

3.5 Data collection procedures
Unstructured in-depth interviews were conducted by the principal investigator and his assistant. The interviews were recorded using digital voice recorder and notes were taken. Self-administered semi-structured questionnaires were completed by users who appeared at the KCs during the data collection period. Facilitators assigned at each of the sites gave the necessary clarifications to the participants on questions. Review of records at the KCs was also carried out to collect data on the pattern of use of resources and the profile of users at the centers. Finally, observation of resources and equipment was conducted to check their state and accessibility to users.

3.6 Data analysis
Qualitative data was transcribed word by word by the research assistant who is health education and behavioral science specialist. The transcript was then read repeatedly to come up with major themes to direct further analysis. Then thematic framework approach to analyze qualitative data was employed. Direct quotes of the participants were made whenever necessary. Similar approach was followed to analyze the data collected through the open ended questions in the users’ survey. The quantitative data from the self-administered questionnaire were entered into computer software (SPSS V 14.0) to generate measures of descriptive statistics. The data from the record review and observation checklists were also narrated. Data obtained from all sources were triangulated to address the study questions and are presented using tables and narrative text.
4. Results

4.1 Description of participants

In this rapid assessment 8 key informants from Bishoftu and Durame hospitals as well as respondents from FMOH and WHO were interviewed. A total of 39 users of the KCs also returned completed self-administered questionnaires. More than two thirds of the respondents were from Bishotu hospital and about three fourth were males. Majority of them (71.8%) were between 22 to 30 years age and about 80% of them had served in the hospital for at least 5 years. The participants constituted all groups of employees in the hospital with clinical nurses, medical doctors and health officers taking the leading share and more than 80% of them being health professionals (Table 1).

Table 1 Description of users of the knowledge centers who participated in the assessment, Dec 2011 (n=39)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Bishoftu</th>
<th>Durame</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-30</td>
<td>17</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>31-56</td>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Mean age 31.1(± 8.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Professional category</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical nurse</td>
<td>6</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Medical doctor</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Health officer</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Lab. technologist/technician</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>IT professionals</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Others*</td>
<td>10</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td><strong>Type of hospital employee</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health professional</td>
<td>23</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Non-health professional</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong>Service year</strong> (n=34)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 5</td>
<td>16</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>≥ 6</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>11</td>
<td>39</td>
</tr>
</tbody>
</table>

*Others include pharmacy technician (2), doctor of dental medicine (2), physiotherapist (2), Data clerk (3), environmental health professionals (1), radiographer (1), monitoring and evaluation professional (1), and manager (1).

4.2 Resources in the KCs

During a study visit to the centres, it was found that each of the two KCs has 5 desktop computers (2 more computers in Bishofutu in the office of physicians) with appropriate chairs and tables. It was noted that initially all the computers were functional, connected to the internet and had functional offline resources including the e-Granary. Since one of the computers is kept aside to be a server of the other computers, only four of the computers were actually available to users.

On the day of the observation, both online and offline resources were functional on the server computers of each center. However, only one of the four computers supposed to be available to the users at the Durame KC was functional with both types of services working correctly. It was also noted that there was technical difficulty to navigate through the e-Granary on the other three computers which was related to software problems in the computers/materials uploaded. In the center of Bishofutu hospital the server and...
four other computers available to users were functional. Of the four computers available to the users, 2
had internet connection and all had the offline resources. But it has to also be noted that navigation
through the e-Granary was reported to be difficult at times as in the case of Durame.

The number of seats and computers available to the users in Bishoftu hospital were said to be insufficient
given the 228 employees the hospital has. The CEO said, “It is difficult to say that the center is
sufficiently equipped.” He recommended, “It is better if additional computers are availed.” The IT focal
person added that the professionals are too busy to wait for turns at the KC. He explained, “The health
professionals do not have much spare time [during work hours]. In order for them to use services at the
center we need to have enough computers.” He recommended adding at least five more computers at the
center and putting other locally connected computers in major service areas of the hospital.

The situation in Durame hospital is a bit different in this regard. Although the resources at the center are
said to be limited, they were considered to be sufficient for the current level of users. The problem with
the Durame center was that not all the computers had the online and offline services. That is why
respondents felt that the KCs are not functioning in their full capacity since the resources at the center are
not available on all the computers at the center. A respondent said, “Currently only one PC is functional
[with all services running properly].” This resulted in limiting the use of the resources by an individual for
“only thirty minutes” since others would usually be waiting. Observation at the KCs revealed that
only two (Durame) and three (Bishoftu) of the five computers, one of which is kept aside to be a server in
each of the centers, ran all services well. A respondent noted, “The access to the materials disappeared
gradually from all computers except one.” Since this happens frequently, an interviewee suggested, “A
trained person who has basic knowledge about KC, particularly about the networking issue, is needed.”

Concerning the materials availed through the e-Granary, a representative of the WHO elaborated, “The
materials which are accessed through these services are global learning materials. Most of them are from
the global package known as ‘Implementing Best Practices (IBP)’. And therefore, it is helpful for all
categories of health professionals. Moreover, the materials are adequate and up to date.”

The E-illuminate service* was operating for few days when the KCs in both hospitals began operating.
However, it was soon interrupted since there were concerns about security which needed clearance at
higher levels. It was found that the FMOH has promised to handle the process of getting permission for this service to be realized. Hence, the interruption is until the FMOH secures clearance granting the permission for operation of this service from the relevant authorities. At this point it is worth to note that the respondents have implied that this service is very much welcomed by the users if it happens to be available.

![Box 1](image)

**Box 1**

Additional resources and specific contents recommended by the users include:

- *E-illuminate online service*
- *Online courses*
- *Online consultation*
- *More books on*
  - Radiology
  - Anesthesia
  - Medical laboratory
  - Gynecology/obstetrics
  - Pediatrics
  - Internal medicine

*The E-illuminate service is a connection of the [knowledge] Centers for “real time” discussion with other health workers, whether in-country or inter-country, on problems and issues they face and the sharing of ideas and/or suggested methods for solutions. They can share information about “what works” and “what doesn’t work” (and why) from their own experiences.

Initially, the health professionals and the IT focal persons in the hospitals, the CEOs and medical
directors of the hospitals, and a team of IT personnel from the Ministry were given training on the use and maintenance of the resources at the KCs. However, additional training sessions were suggested for both the IT focal persons and the health workers. According to the respondents, this enabled the users to refresh and update their skills and the IT focal persons to have better capacity of managing problems at the KC.

It was also suggested that a training component should be a regular function of the KCs. A respondent said, “It is good if basic computer skill training is incorporated as part of the KC project.” The need for further training to the IT focal persons was suggested by a respondent when he said, “Last time, because of some technical problem, the services were interrupted for 2-3 months.” He added, “I could not do anything. The people from the WHO came and solved the problem.” Availing “manuals” which could be used as reference to solve technical problems at the KCs was also suggested.

The establishment of the KC in one additional hospital located in a remote locality (Asossa) is well under way. Representatives from the WHO and the FMOH have noted that all the necessary equipment is already purchased and ready for installation. It was found that initially there was a problem of internet connection which has been solved to date. What makes different the situation here is that the hospital has managed to purchase a one-year air time of 2GB broadband internet connection by itself. However, two-year air time was purchased for both of the other sites with the funds available to the KC establishment project. Currently, the hospital is preparing the room to be used as the KC and it is expected that installation will happen soon.

The issue of sustainability was also raised during the interviews. The CEOs of both hospitals affirmed that sustainability will not be a problem as long as the benefits of the KC are well known to the hospital management. As put by one of the CEOs, “We have now tasted its benefits. I do not think that there will be financial problem. Leave alone addressing emerging problems we may even expand the services of the KCs.” Furthermore, a health manager suggested, “The leadership should lie in the hands of the hospitals. If they do not take the responsibility … it means they would not own it in the future.”

4.3 Users and Preferred services
The services at the KCs include internet services which could enable access to a range of up to date information on almost every subject. This is supplemented by a rich (offline) digital library known as the e-Granary which is full of up to date information in the area of public health and clinical practice. Other resources at the center include the emergency surgical tools, gender women health library, patient safety resources and tools and partograph learning tools. There is also a possibility to put such libraries prepared for other purposes in the centers. The director for the human resources directorate at the FMOH said, “Rich digital library has been prepared for the Millennium Medical Initiative. This is an offline library that enables access to thousands of medical books. Perhaps, we may share that.”

The interviewees from the hospitals affirmed that the health professionals are grateful about having the KCs and are interested to use them. Moreover, it was found that “the majority of the users … are health professionals.” Of all the professional categories in the hospitals, physicians were said to be the most frequent users. However, the nurses, health officers, pharmacists, medical laboratory professionals also make use of the services at the center (also see Table 1). The findings of the record review revealed a different story. It was noted that medical laboratory professionals, nurses and health officers took the largest share in the Durame KC. Similarly, nurses, druggists/pharmacists and health officers were the most frequent users at the Bishoftu center in that order (Table 2). But it has to be noted that this might be affected by the significant proportion of users who have not registered (or registered illegibly) their
professional category. But it has to be noted that the services at the centers are meant to be used by all categories of professionals in the health system including the health extension workers.

At the KC in Bishoftu hospital users come not only from within the hospital, but also from outside. The users who come from outside of the hospital mainly include health professionals working in the Town Health Office and the health center. Although health extension workers are also welcome to use the services, the interviewees reported that they have never seen a health extension worker using services at the center. A respondent said that this might be because the health extension workers don’t know the availability of the KC and whether they can come and use it. Similarly, the CEO of Durame hospital said that health extension workers (even the urban ones) are not using the services at the center since “awareness creation was not done yet.” This might have also happened in the hospitals themselves since it was commented that some view the KC simply as an “internet center.” In Bishoftu hospital, paramedical students who come for clinical attachments were also indicated to make use of the services at the KC.

However, in the case of Durame hospital all users are employees of the hospital. Hence, neither health extension workers nor other health professionals in the surrounding are using the services at the center. A respondent explained, “All the users are staff of the hospital. The computers are not adequate even for us.” He added, “If the services were expanded, people from the health office may use the services at the center”.

Observations and document review at the KCs have indicated that users mostly prefer online services which include e-mail and facebook communication, Google search for specific information of interest, visiting HINARI etc (Table 3). The IT focal person of Bishoftu hospital commented, “Mostly they use the internet services. They use the Google search engine to look up their information of interest.” While the IT focal person in Durame hospital added, “If the online services are available, they prefer to use online resources; if there are no internet connections, they use the offline service.” This was voiced by the IT focal person at the WHO who said, “As to my observation, the health professionals were attracted by the general internet services, like Facebook and e-mail.”

<table>
<thead>
<tr>
<th>Professional category</th>
<th>Frequency of sessions (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Durame</td>
<td>Bishoftu</td>
</tr>
<tr>
<td>Health officer</td>
<td>13 (8.2)</td>
<td>39 (10.8)</td>
</tr>
<tr>
<td>Druggist/pharmacist</td>
<td>3 (2.9)</td>
<td>41 (11.4)</td>
</tr>
<tr>
<td>IT</td>
<td>3 (1.9)</td>
<td>16 (4.4)</td>
</tr>
<tr>
<td>Nurse</td>
<td>15 (9.5)</td>
<td>50 (13.9)</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>0</td>
<td>19 (5.3)</td>
</tr>
<tr>
<td>Medical laboratory</td>
<td>38 (24.1)</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Midwifery</td>
<td>0</td>
<td>13 (3.6)</td>
</tr>
<tr>
<td>Environmental health</td>
<td>6 (3.8)</td>
<td>0</td>
</tr>
<tr>
<td>Physician</td>
<td>12 (7.6)</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Surgeon</td>
<td>0</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Others</td>
<td>4 (2.5)**</td>
<td>13 (3.6)***</td>
</tr>
<tr>
<td>Unregistered</td>
<td>34 (21.5)</td>
<td>139 (38.5)</td>
</tr>
<tr>
<td>Illegible hand writing</td>
<td>30 (19.0)</td>
<td>19 (5.3)</td>
</tr>
<tr>
<td><strong>Total sessions used</strong></td>
<td>158</td>
<td>361</td>
</tr>
</tbody>
</table>

*The frequency is the number of times one or more person(s) has/have used the service.

**Monitoring and evaluation, Data clerk and Dentist.

***Surgeon, gynecology and obstetrics specialist and manager
On the other hand, 21 (56.8%) of the users who participated in the assessment reported that the online services at the KCs are ‘sometimes functional’ while 10 (27.0%) indicated that they are only rarely functional. The offline services are ‘always functional’ as commented by 16 (42.1%) of the participants but sometimes functional as to other 17 (44.8%). It was also found that 16 (41.0%) of the users who participated in the assessment visit the KC three or more times per week while another 11 (28.2%) claimed to visit the center at least once per day. When inquired how frequently they used the online services when available, 16 (42.1%) of the respondents replied ‘sometimes’ while 14 (36.8%) of them used these services ‘most of the time’. The corresponding figures for offline services are a bit lower and 8 (21.6%) of the participants ‘rarely’ make use of these services (Table 4).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Bishoftu</th>
<th>Durame</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency of visit to the KC (n=39)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least once per day</td>
<td>8</td>
<td>3</td>
<td>11 (28.2)</td>
</tr>
<tr>
<td>Once per week</td>
<td>3</td>
<td>2</td>
<td>5 (12.8)</td>
</tr>
<tr>
<td>Twice per week</td>
<td>2</td>
<td>2</td>
<td>4 (10.3)</td>
</tr>
<tr>
<td>Three or more times per week</td>
<td>13</td>
<td>3</td>
<td>16 (41.0)</td>
</tr>
<tr>
<td>Only rarely</td>
<td>2</td>
<td>1</td>
<td>3 (7.7)</td>
</tr>
<tr>
<td><strong>Functional state of online services (n=37)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always functional</td>
<td>5</td>
<td>1</td>
<td>6 (16.2)</td>
</tr>
<tr>
<td>Sometimes functional</td>
<td>15</td>
<td>6</td>
<td>21 (56.8)</td>
</tr>
<tr>
<td>Rarely functional</td>
<td>6</td>
<td>4</td>
<td>10 (27.0)</td>
</tr>
<tr>
<td><strong>Functional state of offline services (n=38)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always functional</td>
<td>10</td>
<td>6</td>
<td>16 (42.1)</td>
</tr>
<tr>
<td>Sometimes functional</td>
<td>14</td>
<td>3</td>
<td>17 (44.8)</td>
</tr>
<tr>
<td>Rarely functional</td>
<td>3</td>
<td>1</td>
<td>4 (10.5)</td>
</tr>
<tr>
<td>Not functional at all</td>
<td>0</td>
<td>1</td>
<td>1 (2.6)</td>
</tr>
<tr>
<td><strong>Frequency of using online services (n=38)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use it most of the time</td>
<td>10</td>
<td>4</td>
<td>14 (36.8)</td>
</tr>
<tr>
<td>I use it sometimes</td>
<td>10</td>
<td>10</td>
<td>16 (42.1)</td>
</tr>
<tr>
<td>I rarely use it</td>
<td>6</td>
<td>0</td>
<td>6 (15.8)</td>
</tr>
<tr>
<td>I don’t use it at all</td>
<td>2</td>
<td>0</td>
<td>2 (5.3)</td>
</tr>
<tr>
<td><strong>Frequency of using offline services (n=37)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use it most of the time</td>
<td>5</td>
<td>5</td>
<td>10 (27.0)</td>
</tr>
<tr>
<td>I use it sometimes</td>
<td>12</td>
<td>2</td>
<td>14 (37.8)</td>
</tr>
<tr>
<td>I rarely use it</td>
<td>7</td>
<td>1</td>
<td>8 (21.6)</td>
</tr>
<tr>
<td>I don’t use it at all</td>
<td>2</td>
<td>3</td>
<td>5 (13.5)</td>
</tr>
<tr>
<td><strong>Convenience of opening hours (n=37)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very convenient</td>
<td>9</td>
<td>2</td>
<td>11 (29.7)</td>
</tr>
<tr>
<td>Slightly convenient</td>
<td>18</td>
<td>7</td>
<td>25 (67.6)</td>
</tr>
<tr>
<td>Not convenient at all</td>
<td>1</td>
<td>0</td>
<td>1 (2.7)</td>
</tr>
<tr>
<td><strong>Convenience of resources and equipments (n=36)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very convenient</td>
<td>6</td>
<td>5</td>
<td>11 (30.6)</td>
</tr>
<tr>
<td>Slightly convenient</td>
<td>20</td>
<td>4</td>
<td>24 (66.7)</td>
</tr>
<tr>
<td>Not convenient at all</td>
<td>1</td>
<td>0</td>
<td>1 (2.8)</td>
</tr>
</tbody>
</table>
With regard to resources and specific contents used, the e-Granary (41.0%), HINARI, emergency surgical tools, patient safety tools and gender women’s health were the offline resources indicated to be used frequently by the participants of the assessment. Specific contents which were claimed to be used frequently include global health issues, cardiovascular diseases, blood transfusion, environmental impact assessment (EIA), malaria, Tuberculosis (TB), Human Immunodeficiency Virus (HIV), information communication technology (ICT) and biological weapons. It was also noted that some of the users infrequently use offline resources such as the e-granary (20.5%), emergency surgical tools and community health issues. On the other hand, e-mail and Facebook communication (59.0%), HINARI, Google search engine, e-medicine and chat rooms were the frequently used online resources by the participants. But some indicated that they infrequently use the online HINARI, Google search engine, and Facebook and e-mail communications.

Respondents of the in-depth interviews also indicated that the specific content visited by the users depends on the specialty/field of the health professionals using the services. However, the CEOs of both hospitals claimed that those who have received training on the use of the services at the KC mostly use the e-Granary which contains information on almost every topic in the fields of public health and medical sciences.

In both of the centers visited, it was found that there are no time limits while using the resources at the KC. A respondent said, “One can use the services as long as he/she wants unless there are others waiting.” This was supported by the findings of the record review. Table 5 below demonstrates how variable the durations of sessions are within and across the KCs. In Durame hospital majority of the sessions (24%) had a length of 30 minutes while the corresponding proportion in Bishoftu hospital was 35.5% for sessions which had a length of 10 minutes (Table 5).

<table>
<thead>
<tr>
<th>Duration of a session in minutes</th>
<th>Number of sessions (%)</th>
<th>Bishoftu</th>
<th>Durame</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>46 (12.7)</td>
<td>6 (3.8)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>128 (35.5)</td>
<td>11 (7.0)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>37 (10.2)</td>
<td>13 (8.2)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>66 (18.3)</td>
<td>29 (18.4)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>7 (2.0)</td>
<td>12 (7.6)</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>32 (8.9)</td>
<td>38 (24.0)</td>
<td></td>
</tr>
<tr>
<td>&gt;30</td>
<td>40 (11.0)</td>
<td>49 (31.0)</td>
<td></td>
</tr>
<tr>
<td>Illegible hand writing</td>
<td>5 (1.4)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total sessions used</strong></td>
<td><strong>361</strong></td>
<td><strong>158</strong></td>
<td></td>
</tr>
</tbody>
</table>
4.4 Operation and management

Both of the KCs visited are served by one attendant (originally the library attendant) and IT focal persons (originally the health management information system focal person). The attendant ensures proper use of all resources in the center and the IT focal person provides support in cases of difficulties while using the resources at the center. However, it has to be noted that the IT professionals have to take care of the responsibility of administering the health management information system (HMIS) network in the hospital, for which they are primarily employed. This makes it difficult for the professionals to be available for helping users of the centers all the time that they are needed.

The library attendant handles all the resources within the center and checks whether the users are appropriately recording what they have used. If there is any technical problem, s/he reports to the focal person. The focal person tries to solve the problem by himself and if not successful, discusses the issue with the medical director who communicates with the WHO IT focal person. However, a representative of the WHO complained, “Although we provided training, the WHO is consulted whenever things go wrong [including minor problems].” He added, “Some of the problems could have been resolved there by the local experts.” Moreover, representatives of the WHO and the FMOH complained that there is a delay in reporting technical failures when they occur at the centers. A respondent said, “Once we were informed after the internet connections were already interrupted for over a period of three months.”

4.4.1 Convenience of opening hours

The main issue raised almost by every respondent concerning operation of the KC was the concern about convenience of the opening hours. The KCs are open from 8:30am to 12:30pm in the morning and from 1:30pm to 5:30pm in the afternoon which are the regular working hours of the hospital. However, in both hospitals respondents replied that health professionals, who are meant to be the main users of the KCs, are busy caring for patients during work hours. This is particularly true during the hours before noon. A respondent said, “[The professionals] are busy during the morning hours handling patients.”

During the afternoon period most of the professionals, except for physicians and nurses at the emergency and inpatient departments, will have some spare time to visit the KC. However, when everybody appears at the KC at the same time (during the afternoon hours) the available resources don’t allow serving the users as required. The IT focal person at the center in Bishoftu hospital explained, “In the afternoon the computers are not enough. Hence, they are obliged to wait for turns.” He added that many of the nurses cannot come to the center if they are caring for patients in the inpatient wards since the KC is not located near the wards. This explains why the majority (67.6%) of the user who participated in this assessment viewed the opening hours of the KCs only slightly convenient (Table 3).

A suggested solution for this was availing the services at the KCs outside the work hours including Saturdays and Sundays. This was voiced by almost all respondents. The CEO of Durame hospital reasoned, “There are only few computers, but there are many people who want to access the resources in the KC. Moreover, the spare time the professionals manage to find during the work hours is not sufficient to satisfy their information need at the center.” Therefore, Durame hospital is planning to extend the opening hours of the center to off duty hours after discussing the matter with hospital management and the board. The CEO indicated, “We have planned to extend opening hours of the center by making off duty payment [to the attendant and the IT focal person].” The recommendation to make the services at the centers during off duty hours was also made by 20 (51.3%) of the users who participated in the assessment.
Implementing this solution is rather differently perceived by the CEO of Bishoftu hospital. He explained that there are no regulations allowing the hospital to make off duty payments to administrative staffs such as the KC attendant. Hence, although the hospital has got enough financial resources to make these payments and extend the opening hours it has to get the issue approved by the Oromia Regional Health Bureau (RHB). However, the matter has already been discussed with the WHO and the FMOH. Apart from making arrangements to extend opening hours by making off duty payments another solution was suggested by one of the respondents. He suggested that shift rotation can be used to extend opening hours at the KCs. But this will be difficult to implement given that the KCs are run by one attendant and the IT focal person. Moreover, the IT focal person has got other duties to take care of.

Respondents were also requested to comment on the suitability of the location of the KC in the hospital compound. Observation at the hospital and the comments forwarded by the respondents showed that the KC in Durame hospital is suitably situated to all sections in the hospital. However, it was found that the KC in Bishoftu hospital is located near the exit from the hospital. This location makes it too far to be visited by physicians and nurses caring for patients in some of the inpatient wards. A respondent commented, “The KC is far from the wards.”

In Bishoftu, to improve access by these professionals, the services of the center have been availed on two computers in the physicians’ office. On top of addressing the issue of location, this enables the physicians to access the services of the center during off duty hours at which the center is not operating. But this is being used only by the physicians since any other person is not allowed into this office. Availing the services in the nurses’ office is being considered in consultation with the WHO. Users who participated in the assessment also forwarded this solution to improve access to the resources of the center. A participant said, “It is good if the services of the KC are made accessible at the different service areas in the hospital.”

Moreover, despite the convenient location of the KC in Durame hospital, it was suggested that networking computers in the office of the professionals to avail services of the center would improve utilization of the services. A respondent said, “We are considering availing services of the KC through networking so that health professionals can use the services in their offices. This is because health workers at Out Patients Department (OPD) cannot come to the center for they have to continuously serve patients.”

4.4.2 Documentation and reporting

The only evidence of activity recording found in the KCs was the formats filled and signed by the users every time they make use of the services at the center. The recording sheet contains name of the user, profession, type of resources used and duration of time. These formats were found to be incomplete although most parts are filled in. The columns of professional category, type of resources used and duration of session were not completed or completed illegibly by the users (Table 2, 3 and 5). A respondent remarked, “The users may sometimes forget to record after using the services.” It was also found that the KCs had no plan for activities to be carried out. A respondent admitted, “The KC does not have a plan. Its purpose is just giving services. The services delivered will be recorded and the records are collected and reported to the WHO.”

However, no compiled report (filed hard copies) was documented in both centers although a soft copy of the last report submitted (some eight months ago) by the Bishoftu KC was witnessed. It was found that weekly activity report was being sent to the WHO initially, particularly by the center in Bishoftu, but has been interrupted for more than six months. A respondent from Durame confirmed, “We have never
reported to anybody.” Hence, reporting of activities is not happening both within (to the Medical
director/CEO) and outside (to the RHB, FMOH or WHO) of the hospitals. However, a CEO described the
benefit of having regular reports as, “If there were reports, we could have known the number of people
who used the services, and the contents they focused on.”

On the other hand, a representative of WHO said that a reporting format was provided to both of the
centers. This claim was confirmed by accessing the soft copy of the format in the centers during the data
collection visit. The report format has items that help to check availability of the resources in the center,
the pattern of use, feedback from users and recommendations to the particular site. At the bottom it
contains an e-mail address (of a WHO staff) to forward the report.

A recommended approach to ensure regular reporting of activities of the KC was to integrate it with the
already existing reporting system through the HMIS. A manager said, “In order for the information to
flow from the district to the zone, and then to the regions and the federal level, the reporting system
should be integrated into the existing system.”

4.4.3 Supervision and technical support

Another concern identified during the interviews was the fact that solving technical problems at the KCs
usually requires contacting the IT focal person at the WHO. This has been considered to be problematic
particularly to KCs located far from the capital city as in the case of Durame. The CEO of Durame
hospital questioned, “How long do they continue coming from Addis Ababa?” He suggested, “They
better train professionals at lower levels so that they can manage the problems onsite.” Similarly, the
CEO of Bishoftu hospital recommended, “It is better to assign a well-qualified person at a strategic
location with easy reach to a group of KCs.” This is “clustering approach” (as stated by one of the
respondents) which enables efficient supervision while resources are limited. Hence, the respondents
agreed that centralized technical support is not commendable if scale up happens to occur. They rather
suggested having one supervising center to satellite KCs located nearby. Explaining the problems in this
regard, a respondent said, “Especially, our communication with the FMOH is through the phone. They
say ‘do this thing; click that thing’ on the phone. That is not comfortable!”

This was compounded by the fact that supervision to the KCs has been irregular. A respondent from
Durame said, “There is no any supervision. They come only when we tell them that there are
interruption/failure of the services.” Another respondent said, “During the early days of its establishment
the supervision was good. But this has not been maintained to date.” Similarly, a representative of the
WHO recalled, “We were going two times a year [for supervision].” Moreover, it was noted that the
supervisions were being done mainly by the WHO and the FMOH. A representative of the WHO said,
“People from the FMOH and our people [people from the WHO] were going to the sites to provide
technical support [every six months].”

Although a representative of the WHO claimed that the RHBs were well involved since the beginning,
their involvement was found to be unknown to the respondents from the hospitals. This is despite the fact
that the implementers expect the Woredas, Regions and Hospitals to take responsibility of running the
KC when they are well established. A health manager hoped, “The districts, the regions and the
hospitals should be able to manage the centers by themselves after two years. We are sure they can run
the centers by their own.”

However, currently there are no signs of shifting responsibility to these bodies. In both of the sites visited
the respondents affirmed that the RHBs, which are overseers of the hospitals, are not yet involved in
issues related to the operation and management of the KCs. It was indicated that the main problem in this regard is the fact that the RHBs lack appropriate IT professionals to get involved in the process. A respondent suggested, “During the scale up, it is good if WHO trains professionals at the RHB so that they can get involved and support the operation of the KC.” This agrees with the intention of the implementers since “The regions should do the supervision afterwards.”

4.5 Benefits and added value of the knowledge centers

4.5.1 Improved access to information

All the interviewees have emphasized the benefits of having a KC in the hospital setting. The advantages mentioned by the respondents include the fact that the KC is useful in helping health professionals to update their knowledge and practice. This was voiced by both health managers at the hospitals and the representatives at the FMOH and WHO. The chief executive officer (CEO) of Bishoftu hospital explained, “I cannot say our hospital was a complete hospital before the establishment of the KC. In order to say that it is a complete hospital, there should be a means by which health professionals update their knowledge.” A respondent at the FMOH also said, “In order to help [professionals working in remote areas] acquire recent advances in the field of health, the knowledge centers are helpful.”

It was also stated that the knowledge centers had created opportunities of easily accessing literature by health professionals who are conducting research as part of their graduate level studies. This was observed in both sites visited during the assessment. A respondent noted that this was also pointed out by the internal assessment conducted by the implementers six months ago. A representative of the WHO summarized the finding of the internal assessment when he said, “We have found that the centers are very useful and that all categories of health workers are using the resources.”

A representative of the FMOH recalled that physicians in different parts of the country were once given the opportunity of conducting researches by a joint initiative of the Addis Ababa University, American Medical Association and Ethiopian Medical Association. “However,” said the manager, “many failed to finish what they began since they had little access to literature and the internet.” He concluded, “Services at the KCs can sufficiently address this problem.”

Even more such benefits are expected to occur in the future. A health manager claimed, “They [KCs] also help the health professionals when they want to study for specialization.” He added that it helps the health professionals not to remain as “chronic General Practitioner (GP)”, as physicians who remain general practitioners for long are usually named. Another respondent explained, “If they [health professionals] want a reference for their distance education, they do not need to come to Addis Ababa. They can use resources of the KC in their respective work place.” That is why a respondent concluded, “The KCs serve the purpose of availing global learning materials and opportunities of continuous medical education and research undertaking.”

The availability of reference materials to inform the practice of the health professionals has improved with the establishment of the KCs. The centers not only enable professionals to access a range of up to data information through the international web, but they also have got offline digital library (e-Granary) which the professionals could use even when internet connections are interrupted. A representative of the WHO said, “Even if the internet service is not available, they can access the offline services.” This has substantially supplemented the libraries in the hospitals. The CEO of Bishoftu hospital admitted that the library in the hospital did not have all the books and other resources required to inform the practice of the
professionals. However, with the establishment of the knowledge centers “many books” and other resources are being accessed by the health professionals through both the online and offline services.

### 4.5.2 Changes on practice, motivation and retention of health workers

One key question posed during this assessment was “did the presence of the KCs affect the practice, motivation and retention of health workforce in the hospitals in any way?” The interviewees claimed that the centers had some contribution in this regard. The CEO of Bishoftu hospital said, “Though answering this question needs an in-depth study, I can say it has some contribution from what I see in the morning sessions and when difficult cases are encountered.” Others felt that use of the resources at the center has also boosted confidence of the professionals while managing cases. A respondent explained, “If the health professionals encounter an extraordinary case, they order relevant laboratory investigations and in the meantime go to the KC to browse issues related to the case.”

Hence, respondents felt that the practice of the health professionals is somehow positively affected due to the presence of the KC. A health manager said, “The KCs have benefited the society in that it helps the professionals to apply up to date and best practices while managing their patients.” Another respondent frequently heard the professionals saying “I saw this online, I saw that offline…” during discussions with colleagues which implies that the resources at the KCs are being at least referred to. A participant also noted, “Even though I do not have documented evidence, I believe there is a change [in the performance of the health workers].” The CEO of Durame hospital explained, “In this hospital, reference materials are not available as they are in teaching institutions. So, only limited reference materials are available. The health professionals refer the materials in the KC for their morning session discussions which could possibly affect how they manage patients.” Moreover, 34/36 (94.4%) of the users who participated in the assessment said that they feel up to date and confident about their practices informed by the resources at the KCs (Table 6).

The respondents in Bishoftu hospital further stated the advantage of the KC by claiming that it has also played a role in improving satisfaction of the health workers with their job. The CEO explained, “An indicator for this is that our professionals don’t leave the hospital compound even after 5:00pm. Guests from different parts of the country found this to be quite impressive since workers in other hospitals leave the compound as early as 4:00pm.” Similarly, all of the 34 (87.2%) who responded to this question in the mini-survey claimed that they have been more motivated to patient care due to the services they access at the KCs (Table 6).

As indicated in the concept note for the establishment of the KCs, the major aim of setting up the centers is to “contribute to the retention of an effective, responsive and equitably distributed health workforce” in the health system. In view of this the director for human resources directorate at the FMOH said, “The centers are helpful in improving staff retention in hospitals such as Durame and Asossa [in remote areas of the country].” This purpose of establishing the KCs was known to all of the health managers interviewed. A manager at the WHO said, “When we designed the project, along with the Global Health Workforce Alliance, it was aimed to be part of the new initiative [of the country] for the retention of health workers in remote areas.”

Hence, although it is too early to really attribute the changes in the ability of the hospitals to attract and retain human resources for health to the presence of the KCs, respondents have felt that the presence of a KC in a hospital can contribute to such efforts. According to the CEO of Bishoftu Hospital, the KC has played a part in the successful retention of health workers although the hospital is already attractive to all
categories of workers for several reasons. The IT focal person in the hospital supported this claim when he said, “Even the physicians do not want to leave the hospital.”

The presence of the KCs is even more important in this regard in hospitals located in remote parts of the country such as Durame. Respondents noted that since the main aim of establishing the KCs is to support efforts of retention of health professionals in remote areas, the scale up phase will focus on hospitals located in remote areas of the country. A representative of the WHO said, “We selected Bishoftu, because there was a problem of [internet] connection in other sites. This is only for the pilot period. After the pilot period is over, we will expand it to remote areas.” This was also voiced by the representatives of the FMOH.

In support of this, the CEO of Durame hospital noted that the KC has resulted in a better probability that health professionals remain as employees of the hospital since it has satisfied their information and communication needs. This explains why one of the health managers viewed KCs as “a non-financial retention mechanism.” Similarly, 33/37 (89.2%) of the participants in the survey replied positively when asked whether the presence of the KC affects their decision to stay and work in their respective hospital (Table 6).

A representative of the WHO said that the KCs contribute not only in retention but also in the development of human resources for health while they are at work. He explained, “It is possible to network the centers with large hospitals, for example with the Black Lion Hospital, and with universities.” He added that if professionals are leaving the hospital for further education, this will aggravate the already existing shortage of professionals. “However, if the KC is connected to universities, the duration for which they will be required to be at the universities will be minimized. Moreover, the center will solve the problem of access to books and other resources while they are learning.”

Realizing this contribution of having KCs in hospitals located in remote parts of the country, the human resource directorate of the FMOH has included establishment of KCs in such hospitals in one of the initiatives it has planned, motivating and retaining health workers. The director said, “The FMOH has the intention to give laptop computers for those health professionals who are willing to work in remote areas.” He added, “The main purpose of doing this is to enable them update their knowledge and keep them motivated.” This is in line with the very purpose of establishing the KCs from the outset. Hence, establishing KCs is definitely an addition to the already existing package of incentives for health professionals working in health facilities of remote localities. The CEO of Durame hospital said, “… nowadays, people search for places where there is access to information. That is why we indicate the existence of the KC when we announce vacancies.”

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved motivation to patient care (n=34)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>34 (100)</td>
</tr>
<tr>
<td>Motivated to stay and work (n=37)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33 (89.2)</td>
</tr>
<tr>
<td>No</td>
<td>4 (10.8)</td>
</tr>
<tr>
<td>Feel up to date and confident (n=36)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>34 (94.4)</td>
</tr>
<tr>
<td>No</td>
<td>2 (5.6)</td>
</tr>
<tr>
<td>Affect computer skill (n=36)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 (38.9)</td>
</tr>
<tr>
<td>No</td>
<td>22 (61.1)</td>
</tr>
<tr>
<td>Affect IT skills (n=35)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17 (48.6)</td>
</tr>
<tr>
<td>No</td>
<td>18 (51.4)</td>
</tr>
</tbody>
</table>

Table 6 The effect of the services at the KCs on human resources and capacity building, Dec 2011
4.5.3 Other benefits
The opportunity of better communication access for the users of the KCs was pointed out by participants, particularly referring to the situation in Durame. As stated by a representative of the WHO, creating access to online resources which the professionals can use was one of the main issues during the establishment of the KCs. This has served a secondary objective of enabling the health professionals and other users of the centers to have access to internet connections which they might use to create and maintain relationships with the outside world. A respondent explained that the centers are useful in this regard “for areas not having access to internet services.” This was affirmed by the CEO of Durame hospital who said, “Had it not been for the establishment of the KC, we did not have access to internet.”

Another useful byproduct of having the KCs was its effect on computer literacy and familiarity to the internet among the employees of the hospitals. This happened since “training was given to most of the health professionals” during the establishment of the KCs as explained by a WHO representative. Moreover, an IT focal person said, “Most of the time, only the offline service is available. Therefore, we show them how to use and navigate through it.” The IT professional in Bishoftu hospital said, “This is what I liked most about my work here. We have oriented individuals who have never touched the keyboard.” He added, “Now, I am pleased to see them using the internet and open e-mail accounts without requiring any help.” Similarly, the IT professional in Durame concluded, “After the establishment of the KC, the IT skills of the health professionals and the way they browse the internet has improved.”

The capacity building in this regard is ongoing since the IT professionals and the KC attendants are helping the users when difficulties are encountered. It was found that 14/36 (38.9%) of the users who participated in the assessment claimed that the services at the KC have affected their computer skills. On the other hand, 17/35 (48.6%) of the participants said that the services have affected their IT skills as in the case of using the internet. One of the participants said, “I started at zero. I learnt how to turn on and off the computer at the KC.” He added, “Currently, I know how to trace up to date information and communicate through e-mail and facebook.”

4.6 Challenges faced
Given the objectives of establishing the KCs, in-depth interview respondents implied that there are some serious problems requiring due attention. These include repeated interruption of internet connection (particularly in Durame), failure of the e-Granary, inconvenient opening hours, non-functional computers, and failure to access journal articles in the HINARI.

Internet technologies being used in the two centers are of different types. The one in Bishoftu is more stable since it is a better technology while the one in Durame gets frequently interrupted since it is based on satellite means. The IT expert at the WHO explained, “The internet connection in Durame may be interrupted if there are clouds.” On the other hand, one can easily get connected to the internet in the compound of Bishoftu hospital where there is a broadband wireless connection.

The password required to access journal articles in the HINARI was provided to the KC in Bishoftu hospital. However, the library attendant and the IT professional complained that it changes frequently. Currently, resources in the HINARI are not accessible to users in the KC of Bishoftu hospital. When inquired why they did not report, the IT focal person replied, “We did not know whom to consult about this.” Similarly, the resources in the HINARI have never been accessed at the KC in Durame hospital. The password once received by the center did not work. Respondents reported that although the team
from WHO promised to resend a password that has not happened yet. Box 1 below presents the list of problems identified by the users who were interviewed in the assessment.

Box 2
Problems listed by users of the KCs include:

- Opening hours limited to work hours
- Frequent internet interruption
- Delayed computer maintenance
- Shortage of computers
- Power interruption
- Failure to navigate through the offline resources
- Shortage of papers for printing

One more challenge so far encountered relates to the frequent turnover of managers in the hospitals. Representatives of the WHO and FMOH complained that there was no proper hand over of issues related to the KC when the CEOs changed about three times during the two years period. A health manager at the WHO said, “It was for this purpose that we established technical support groups at the hospitals, RHBs, and FMOH.” He added, “The medical director, the CEO, the hospital administration as a whole should have followed up this.” Moreover, it was said that institutionalizing the KCs requires that people at the respective sites should welcome it and there should be appropriate hand over whenever people leave their posts. Others recommended that preparation of manual on how the KC should operate might help address the problem of lack of orientation by the new coming managers.

It was suggested that the roles and responsibilities of all stakeholders in the management and operation of the KCs should be clarified and documented in writing. For instance, it should be clearly indicated which problems should be handled by local experts and which mandate calling for external assistance. Other recommendations forwarded by the respondents were: the purpose of the KCs needs to be well understood by all users, availing services at the KC during off duty hours, and create sense of ownership by the MOH staff at all levels.
5. Conclusions

From the findings of the rapid assessment presented so far the following conclusions were drawn:

- All of the users at the KC in Durame are the employees of the hospital the majority being the health workers. Similarly, users of the KC in Bishoftu are health workers of the hospital although those in the town health office and the health center were also using the services. Health extension workers or other members of the society are not using the services in both of the centers.
- The online services are much more preferred than the offline services by the users of both centers. About 60% of the uses indicated that they used the online services for e-mail and facebook communications. It was noted that specific contents used by the users are dependent on the type of the professional.
- More than a quarter of the users interviewed visit the KC at least once per day while another 41.0% visit the center three or more times per week.
- Specific contents of the offline and online services were highly appreciated by the users and managers interviewed. However, some contents were still suggested to be included in the offline services.
- The presence of the KCs in the hospitals has improved access to up to date information, through different literatures and reference materials, by the health professionals.
- All participants of the assessment claimed that the practice, motivation and satisfaction of the health workers in the hospital have improved since the establishment of the KCs. It was also found that the KCs have contributed in improving the ability of the hospitals to retain health workforce.
- The KCs have helped employees of the hospital to develop and maintain a reasonable level of computer and other IT skills.
- The establishment of one additional KC in Asossa is well under way and preparations have been completed.
- The computers available to the users at the KCs were found to be insufficient. This was particularly true since only few of the computers in both centers were functional with all offline and online services working.
- The training provided to the users and others was well appreciated by all of the participants although most felt that there is a need for additional training particularly to users and the IT focal persons. This was suggested since all computers supposed to be available to users are not having all services operating correctly all the time.
- The opening hours of the KCs was judged to be largely inconvenient by the users and representatives interviewed. Location of the KC in Durama was found to be convienent while the case in Bishoftu was the opposite. Availing the resources at the KCs at the different service areas of the hospital was suggested by respondents of both sites.
- Although registration sheets filled in by the users were witnessed at both sites, there was no any sign of regular reporting of the activities of the KC to the hospital or other authorities. The registrations sheets filled in by the users are incomplete in significant portions of the form. It was also found that the KC has no any operational plan.
- There were regular supportive supervisions to the KCs initially. Currently, all respondents agreed that it has become irregular and based on reports of failure at the KCs.
• Other challenges reported from both sites include frequent interruption of the online services and power, frequent failure in the offline services particularly the e-Granary and delay in computer maintenance.

6. Lessons learnt

It was found that most of the users at the KCs are health workers of the hospitals. More specifically, all of the users at the KC in Durame are the employees of the hospital the majority being the health workers. Similarly, users of the KC in Bishoftu are health workers of the hospital although those in the town health office and the health center were also using the services. Health extension workers or other members of the society are not using the services in both of the centers. Given the intention of availing the services at the KCs to a wide range of health workers and possibly to others in the community little has been done to make the services known to health extension workers and others. This might be related to the fact that ownership of the program still remains in the hands of the hospitals, FMOH and WHO. Since the health systems in the regions are governed by the regional governments and the RHBS working to transfer/share ownership of this program to these bodies might make the KCs more popular.

The online services are much more preferred than the offline services by the users of both centers. The preference of the users might relate to the fact that online services provide access to general benefits of having internet connectivity such as e-mail and Facebook communications rather than access to technical materials per se. This was evident from the fact that about 60% of the users used the online services for e-mail and Facebook communications. It was noted that specific contents used by the users are dependent on the type of the professional.

More than a quarter of the users interviewed visit the KC at least once per day while another 41.0% visit the center three or more times per week. Specific contents of the offline services such as the e-Granary and HINARI and the online services which provides internet connectivity were highly appreciated by the users and managers interviewed. However, services such as the E-illuminate service, online courses and online consultations were suggested to be added to the existing services of the KCs. Moreover, additional technical contents on radiology, anesthesia, medical laboratory, gynecology/obstetrics, pediatrics and internal medicine were recommended to be included in the e-Granary by the users.

The presence of the KCs in the hospitals has improved access to up to date information, through different literatures and reference materials, by the health professionals. All participants of the assessment claimed that the practice, motivation and satisfaction of the health workers in the hospital have improved since the establishment of the KCs. Moreover, the KCs were perceived to have contributed in improving the ability of the hospitals to retain health workforce. This is a remarkable finding in the light of the main objectives of the establishing the KCs. Hence, continued support to run these KCs and scale up of this effort in similar settings can safely make the assumption that presence of a KC positively affects the development and retention of human resource in district hospitals located far from the center of a country. This is even more pronounced by the fact that the KCs have helped employees of the hospital to develop and maintain a reasonable level of computer and other IT skills which are quite useful to the effort of computerizing the health information system of the country.

The computers available to the users at the KCs were found to be inadequate. This was particularly true since only few of the computers in both centers were functional with all offline and online services
working. This implies that there is a need to pay critical attention to increasing the number of the available computers per center and maintaining services on the existing ones promptly to make sure that future efforts to scale up the establishment of KC in similar settings do not suffer the same problem. This also indicates that the IT personnel, up on whom the operation of the KCs largely depends, do not have adequate skills to diagnose and treat the problems faced in the centers which calls for assignment of more qualified IT professionals in/near the KC.

It has to be noted that this might also be related to the lack of regular supervision of the KCs. It was found that there were regular supportive supervisions to the KCs initially. Currently, however, all respondents agreed that it has become irregular and based on reports of failure at the KCs. This implies that centralized supervision such as the one in the pilot phase will not be feasible if scale up of this effort happens to occur. Such arrangements as assigning qualified IT professionals in the zonal health departments (ZHDs)/RHBs could minimize the physical barrier between the KCs and the supervisors.

An important factor that makes a service rendering center such as the KC liked by its users is the convenience of its opening hours to the customers. In this assessment it was found that the opening hours of the KCs (limited to working hours) were judged to be largely inconvenient by the users and representatives interviewed. Hence, there is a need to make arrangements to avail the services of the KCs during off duty hours since health professionals are in almost all cases too busy to visit the KC adequately during working hours. This cannot happen without full engagement of the regional governments and the RHBs whose support is mandatory to easily realize such intentions which require allocation of budget.

Location of the KC in Durama was found to be convenient while this was not the case in Bishoftu. This implies that even the location of the room to be used as the KC need to be chosen carefully. Availing the resources at the KCs at the different service areas of the hospital was suggested by respondents of both sites to address the problems related to opening hour and location. This means more computers need to be available and local networking has to be done at different service areas of the hospital. The costs of doing this have to be weighed to those of making arrangements to avail services at the KC during off duty hours and properly situating the KC in the hospital compound.

The registrations sheets filled in by the users were incomplete in significant portions of the form. This was mainly related to reluctance of the users to consistently and completely register the required information on the registration forms. This happens despite the continued reminder given by the KC attendants to fill in all the information immediately after use and availability of the required stationeries to do so. Hence, introduction of an electronic login mechanism which automatically registers all the necessary information every time the user logs in might be helpful in this regard.

On the other hand, although registration sheets filled in by the users were witnessed at both sites, there was no any sign of regular reporting of the activities of the KC to the hospital or other authorities. This means internal and external stakeholders of the KC are poorly informed about the achievements and challenges of the center which affects their enthusiasm to support continued operation of the center. If responsible managers inside and outside the hospital are well informed about the activities at the center, however, they may proactively act to ensure sustainability and scale up of the services at the center.

Coming to other challenges faced so far, any scale up effort should make sure that sites to be used for establishment of a KC should have reliable internet connection. This must be a concern particularly in areas like Durama where there is frequent failure of internet connections. There is also a need to make
sure that the room to be used as the KC is located at a location of the hospital compound which is accessible to workers from all the services areas. The functional state of the e-Granary has to be followed up closely to ensure that it works properly. This is particularly critical in areas where there are frequent internet interruptions. Moreover, password to access journal articles in the HINARI should not change too often and there is a need to timely communicate the new password to the KCs if any change happens to occur.

Box 3
Summary of lessons learnt

- Presence of a KC in a hospital of remote locality positively affects the development and retention of human resource for health
- Ownership of the initiative by the appropriate authorities governing the hospitals is crucial
- Implementation of the initiative has to take its complete form by including the E-illuminate service, online courses and online consultations
- Continuous IT support and adequately equipping the KC were noted to be very essential
- Centralized and irregular supervisions have were not helpful in the effective operation of the KC
- Suitability of opening hours of the KC has to be contextual determined
- Suitably locating the KC in the hospital compound and internal networking are possible means of improving access to the services
- Reliable internet connections and power supply are backbone to smooth operation of the KC.
8. Recommendations and Way forward

From the conclusions made above the following measures are recommended to inform the way forward in the scale up of the KC initiative for local and global purposes:

- The hospital authorities and the supervision team have to be engaged in further awareness creation among hospital staff and others to ensure that the resources at the center are adequately utilized. Emphasis has to be given to the value of using the offline services by the health workers.

- Despite the challenges faced, all the stakeholders in this initiative have to note that the main goal of the initiative is being realized. This has to move the MOH at all levels, the WHO and the hospital authorities to ensure availability of enough number of functional computers, functional state of the online and offline services at the centers, and continuous and regular supervision of the KCs.

- To address the issue of regular supervision availing adequately qualified IT professionals at strategic location to serve a group of KCs is recommended for the scale up phase. Such arrangements as assigning qualified IT professionals in the zonal health departments (ZHDs)/RHBs could minimize the physical barrier between the KCs and the supervisors.

- The hospitals in collaboration with the RHBs and the local authorities have to create a means to ensure that the opening hours are made convenient to the health workers in the hospitals. This could particularly be realized by keeping the centers open during off duty hours by making the necessary arrangements.

- Users of the KCs need to understand the value of fully completing the registration sheets after using resources at the center. It might also be made a requirement to fill in the registration form at the beginning which means the user will only have to register the contents used and time elapsed before he/she leaves the center after use. More preferably, introduction of an electronic login mechanism which automatically registers all the necessary information every time the user logs in might be designed.

- The MOH at all levels, the WHO and the hospital authorities have to look for possibilities of availing services of the KC at strategic locations in the hospital (through local area networking) rather than limiting the services in the KC itself. This definitely needs procurement of more computers and additional local area networking for each of the sites.

- The FMOH with technical assistance from the WHO should prepare standard operating procedure (SOP) and manual to facilitate operation and maintenance at the KCs.

- The RHBs have to be actively engaged in this whole process since they are definitely concerned about the proper development and maintenance of health workforce in their hospitals. For instance, it is high time that the RHBs were involved in the regular supervision and follow up of the activities of the KCs as they do for other matters in their hospitals.

- Based on the successes of the two centers in meeting the intended objectives to a significant degree, it is recommended that the FMOH and other stakeholders in Ethiopia should plan for the scale up of this initiative to other hospitals located in remote parts of the country.

- Likewise, the findings in this assessment imply that other countries with similar context may consider adapting this initiative to their existing circumstances possibly with the support of the partners like the Alliance and WHO.
9. Annex I: Questionnaires

a. In-depth interview guide

a1. Health facility managers and KC attendants,

Introduction

In 2010 the Federal Ministry of Health (FMOH) of Ethiopia in collaboration with the Global Health workforce Alliance and the World Health Organization undertook to establish three pilot knowledge sharing and exchange centres, or simply knowledge centres (KCs). Accordingly the knowledge center in your hospital was established.

We are conducting a rapid assessment to document the benefits and experiences gained since the introduction of the knowledge centre. As manager of the health facility/attendant of the KC we have found your participation to be helpful for the purpose of the assessment. Your participation in this assessment is completely voluntary. However, we would like to remind you that the information you provide in the course of the interview is highly valued and will be used to come up with recommendations for strengthening existing centers and for future scale up of the activities of the knowledge center in other similar settings (within and outside the country).

Shall we proceed with the interview?

Yes ____________

No ____________

Questions and probes

1. In your view, what is the value of having the knowledge center in your hospital?
   Follow up:
   a. Do you feel the KC has all the necessary resources and facilities to provide the support it should for all categories of health professionals in your hospital?
   b. How frequently do your health professionals make use of the resources in the KC?
   c. Do you feel the KC is conveniently operating (opening hours, location etc.) to all health professionals who should access its services?

2. Which of the services of the KC are mostly used by the health professionals visiting the center? (online/offline)
   Follow up:
   a. Can you specify particular contents of these services being frequently used?
   b. Was the E-illuminate service started? Why was it discontinued?

3. How do you compare the practice of your health professionals before and after the establishment of the KC?
   Follow up:
   a. Do you feel that the presence of the KC has made a difference in the way your professionals provide healthcare to your clients and patients? If so, how?
b. Do you think this had any effect on the capacity and performance of your health professionals? Please, explain.

4. What capacity building has happened (e.g. computer literacy, use of ICT facilities etc.) in addition to the primary purpose of providing up to date information for medical care and public health practice?

5. What is the effect of the presence of the KC in your hospital on the satisfaction and motivation of your health professionals?
   Follow up:
   a. Do you feel that the presence of the KC has helped your hospital to better retain health professionals? If so, can you substantiate this with data?
   b. Do you think the KC in your hospital serves as an added attraction to health workers to serve in a rural area (in areas far from the capital)?

6. What is the value, if any, of the KC in your hospital for research purposes for the health workers and other stakeholders such as academic institutions?
   Follow up:
   a. Has anybody/organization used the resources of the KC for research undertaking?

7. Do you know any other individuals/group of individuals (other than your staff) utilizing the KC in your hospital? If yes, who are these?

8. How do you comment on the operation and management of the KC?
   Follow up:
   a. Are you and your staff comfortable with the way the KC is being managed currently? If not, what changes do you recommend?
   b. Do you have any comments on how to improve the documentation and reporting at the KC in your hospital?
   c. Is there any supportive supervision for the KC currently? If not, do you feel it should have any sort of supervision? If yes, by whom?

9. How could activities in the KC and their effectiveness be improved in the future?
   Follow up:
   a. Which of the operations/management of the KC need modifications if these activities are to be implemented in other countries/locations (in case of scale-up)?
   b. What are the changes you recommend?
   c. What are the strengths of the KC at your hospital you suggest to retain during scale up efforts?

   a2. FMOH and WHO staff

Introduction

In 2010 the Federal Ministry of Health (FMOH) of Ethiopia in collaboration with the Global Health workforce Alliance and the World Health Organization undertook to establish three pilot knowledge sharing and exchange centres, or simply knowledge centres (KCs). Accordingly the knowledge centers in Bishoftu and Durame hospitals were established.

We are conducting a rapid assessment to document the benefits and experiences gained since the introduction of the knowledge centre. As representative of the FMOH/WHO we have found your participation to be helpful for the purpose of the assessment. Your participation in this assessment is completely voluntary. However, we would like to remind you that the information you provide in the
The course of the interview is highly valued and will be used to come up with recommendations for strengthening existing centers and for future scale up of the activities of the knowledge center in other similar settings (within and outside the country). The interview will take 30 to 40 minutes.

Shall we proceed with the interview?

Yes ____________  
No ____________

Questions and probes

1. In your view, what is the value of having knowledge centers (KCs) in hospitals of settings similar to Bishoftu and Durame?
   Follow up:
   a. Do you feel the KCs have all the necessary resources and facilities to provide the support they should for all categories of health professionals in the hospitals?
   b. Do you feel the KCs are conveniently operating (opening hours, location etc.) to all health professionals who should access its services?
   c. Do you feel that the KCs are well utilized by health professionals of the hospitals?

2. How do you comment on the effect of the KCs on the health workers performance?
   Follow up:
   a. From the reports you have received/your observation during visits to the KCs, do you think the establishment of the KCs had any effect on the capacity and performance of the health professionals working in the hospitals? Please, explain.
   b. Do you feel that the KCs have made a difference in the way the health workers provide healthcare to clients and patients? If so, how?

3. What capacity building has happened (e.g. computer literacy, use of ICT facilities etc.) in addition to the primary purpose of providing up to date information for medical care and public health practice?

4. Can you relate the presence of the KCs in the hospitals with the satisfaction and motivation of health workers in the hospitals?
   Follow up:
   a. Do you feel that the presence of the KCs have helped the hospitals to better retain health professionals? If so, can you substantiate this with data?
   b. Do you think the KCs in the hospitals serve as added attractions to health workers to serve in a rural area (in areas far from the capital)?

5. What is the value, if any, of the KCs for research purposes for the health workers and other stakeholders such as academic institutions?
   Follow up:
   a. Has anybody/organization used the resources of the KC for research undertaking?

6. How do you comment on the implementation process of the different service of the KC (i.e. online, offline and E-illuminate services)?
   Follow up:
   a. Did any of these services prove to be difficult to implement? If yes, can you explain why?

7. Do you know any other individuals/group of individuals (other than hospital staff) utilizing the KCs? If yes, who are these?

8. How do you comment on the operation and management of the KCs?
Follow up:
   a. Are you and your staff comfortable with the way the KCs are being managed currently? If not, what changes do you recommend?
   b. Do you have any comments on how to improve the documentation and reporting at the KCs?
   c. Is there any supportive supervision for the KCs currently? If not, do you feel that they should receive any sort of supervision? If yes, by whom?

9. How could activities in the KCs and their effectiveness be improved in the future?
   Follow up:
   a. Which of the operations/management of the KC need modifications if these activities are to be implemented in other countries/locations (in case of scale-up)?
   b. What are the changes you recommend?
   c. What are the strengths of the two KCs you suggest to retain during scale up efforts?

10. Finally, would you like to forward any comments in relation to the establishment and operation of the KC at Assosa?

   **b. Observation checklist**
   1. Name of the facility ____________________________
   2. Duration since the KC started functioning ____________________________
   3. Is the KC located conveniently to all departments and units of the hospital? (ask the KC attendant)
      a. Yes
      b. No
         i. Give a description of the location of the KC.
            __________________________________________________________
            __________________________________________________________
   4. Does the KC have personnel with the capacity to give ICT assistance to the users?
      a. Yes
      b. No
   5. How many computers does the KC have? ____________________________
      a. Are these sufficient for the services it provides to the health workers? (ask the KC attendant)
         i. Yes
         ii. No
            1. If no, how many additional computers are required?
   6. Is the space used by the KC sufficient for the client flow it has? (ask the KC attendant)
      a. Yes
      b. No
   7. Which services were available (functional) at the time of observation?
      a. Online services
      b. Offline services
      c. E-illuminate service
      d. None
   8. How many of the available serving computers were occupied during the observation?
   __________________________________________________________
9. Once a person has started making use of a service at the KC, for how long can he/she use it?
   a. As long as he/she wishes
   b. It is limited by time
      i. If so, how many minutes are allowed per session? ______________

10. Which of the services were being used at the time of the observation?
    a. Online services
    b. Offline services
    c. E-illuminate service
    d. None

11. Was (were) there service user(s) at the KC other than the health workers of the hospital during the
    observation?
    a. Yes
    b. No

12. How many hours a day does the KC provide service? _______________________

13. At what time does the KC open and close? _______________ and _______________

**c. Record review**

1. Name of the facility ____________________________

2. Are there proper recording of daily activities at the KC?
   a. Yes
   b. No

3. Does the KC have an annual plan document? (if yes, ask if you can see it)
   a. Yes
   b. No

4. What is the average number of persons per day visiting the KC? (take the data for the last three
   months and give minimum and maximum) _____________________________

5. During the last three months how many persons visited the KC:
   a. Once? __________
   b. Twice? __________
   c. More than twice? __________

6. During the last three months how many of the following visited the KC?
   a. Health workers of the hospital __________
   b. Other hospital staff __________
   c. Health workers outside the hospital __________
   d. Other members of the community __________

7. Does the KC report to anybody/organization regularly?
   a. Yes
      i. If yes, to whom and how frequently?
         __________________________________________________________________
         __________________________________________________________________
   b. No

8. Can we observe how the reports are prepared and copies are kept here? (observe the report and
   document your comment)
d. **Self administered interview (users of services at the KC)**

In 2010 the Federal Ministry of Health (FMOH) of Ethiopia in collaboration with the Global Health workforce Alliance and the World Health Organization undertook to establish three pilot knowledge sharing and exchange centres, or simply knowledge centres (KCs). Accordingly the knowledge center in this hospital was established.

We are conducting a rapid assessment to document the benefits and experiences gained since the introduction of the knowledge centre. As a beneficiary (user) of the services of the KC we have found your participation to be helpful for the purpose of the assessment. Your participation in this assessment is completely voluntary. However, we would like to remind you that the information you provide in the course of the interview is highly valued and will be used to come up with recommendations for strengthening existing centers and for future scale up of the activities of the knowledge center in other similar settings (within and outside the country). The interview will not take more than 15-20 minutes.

Shall we proceed with the interview?

Yes ____________  
No ____________

**Background information**

1. Age ____________
2. Sex                    a. Male                      b. Female
3. Your professional category
   a. Medical doctor
   b. Clinical nurse
   c. Midwife nurse
   d. Medical laboratory technician/technologist
   e. Environmental health professional
   f. Health educator
   g. Pharmacy technician/pharmacist
   h. Others (please specify) __________________________
4. Year of service (if you are employee of the hospital) __________________________
5. Are you:
   a. A health worker of the hospital?
   b. A health worker outside the hospital?
   c. A non-health worker employed in the hospital?
   d. A non-health worker who came from outside of the hospital?
   e. Others (please specify) __________________________
6. How frequently do you visit the Knowledge Center (KC) in this hospital?
   a. At least once daily
   b. Once per week
   c. Twice per week
   d. Three or more times per week
   e. Only rarely
7. How is the availability (functional state) of the following services whenever you visit the center?
a. Online services
   i. Are always functional
   ii. Sometimes functional
   iii. Rarely functional
   iv. Not functional at all

b. Offline services
   i. Are always functional
   ii. Sometimes functional
   iii. Rarely functional
   iv. Not functional at all

8. When the services are available, which services do you use frequently?
   a. Online services
      i. I use it most of the time
      ii. I use it sometimes
      iii. I rarely use this service
      iv. I don’t use this service at all
   b. Offline services
      i. I use it most of the time
      ii. I use it sometimes
      iii. I rarely use this service
      iv. I don’t use this service at all

9. Which of the contents of the offline services do you use frequently?
   _________________________________________________________
   _________________________________________________________
   _________________________________________________________
   ______________________________________________________

10. Which of the contents of the offline services are least frequently used by you?
    _________________________________________________________
    _________________________________________________________
    _________________________________________________________
    ______________________________________________________

11. Which of the contents of the online services do you use frequently?
    _________________________________________________________
    _________________________________________________________
    _________________________________________________________
    ______________________________________________________

12. Which of the contents of the online services are least frequently used by you?
    _________________________________________________________
    _________________________________________________________
    _________________________________________________________
    ______________________________________________________

13. Do you recommend any additional contents to be included in any of the above the services?
   a. Yes
      i. If yes, please list the additional contents you recommend?
         _________________________________________________________
         _________________________________________________________
         _________________________________________________________
         ______________________________________________________
14. How did you come to know about the KC in this hospital?
   a. Heard about it from a friend (co-worker)
   b. Notified by an awareness creation meeting
   c. Notified by a letter from the hospital CEO
   d. Read about it on the notice board
   e. Other(s) (please, specify)__________________________

15. How convenient are the opening hours of the KC to you and your colleagues?
   a. Very convenient
   b. Slightly convenient
   c. Not convenient at all

16. If the opening hours are slightly convenient/not convenient at all to you, when should the KC open
    and close to meet your needs? ________________________________

17. How convenient are the resources and equipments in the KC to you and your colleagues?
   a. Very convenient
   b. Slightly convenient
   c. Not convenient at all

18. If the resources and equipments are slightly convenient/not convenient at all to you, what changes do
    you suggest to meet your needs?

19. Do you feel more motivated to patient care you provide in this hospital due to the services available to
    you at the KC?
   a. Yes
   b. No

20. Are you more motivated to stay and work in this hospital due to the services available to you at the
    KC?
   a. Yes
   b. No

21. Do you feel up to date and confident about your practice informed by the resources at the KC?
   a. Yes
   b. No

22. Did the services available at the KC affect your computer skill?
   a. Yes
      i. If yes, please explain how?

23. Did the services available at the KC affect your skills of using ICT tools (e.g. using the internet)?
   a. Yes
i. If yes, please explain how?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

b. No
9. Annex II: Concept note of the Knowledge centres

Federal Ministry of Health

Knowledge Centers for Better Healthcare (KCBH) in Ethiopia

Collaboration:

Global Health Workforce Alliance    World Health organization
Project Goal: Contribute to the retention of an effective, responsive and equitably distributed health workforce.

1. Background: Ethiopia is a huge country, with weak health systems due to the lack of properly trained and inadequate skill mix of health expertise, manifesting significant disparity between regions. More than 85% of the population has limited access to basic health services. Topographically the country is inaccessible and information cannot reach all regions easily. Therefore, health workers do not want to stay and work in rural and remote areas since infrastructure, best practice guidelines/information for skills building (continuous professional development) and communication is difficult. Furthermore, most of the health facilities in the country do suffer frequent stock-outs of drugs, equipment and supplies to deliver basic life-saving surgical (including anesthesia, obstetrics and trauma) services at district level.

2. Project Concept

The health workforce is the backbone of the health system. We are at a time of change when governments are recognizing the importance of well-trained health workers in sufficient quantities to address the health needs of their populations. There are not enough well-trained personnel to meet the health needs of the population. There are multiple factors of importance to the shortage, such as: skills imbalances; mal-distribution of workers between urban and rural areas and within those, public and private sectors; poor work environments; lack of incentives to remain in post; and lack of strong management, all of which have added to the push factors of migration, which has accelerated in the last decade. Governments are looking for new solutions to address the health workforce shortage; and health workers themselves, from ministry of health to grass root levels, are articulating the desire and need for more evidence-based information to inform practice and equip the health workers with the appropriate competencies.

The report by the GHWA Scaling Up Education and Training task force entitled 'Scaling Up, Saving Lives' points to the fact that the massive scale-up of education and training required to achieve the necessary increase in the health workforce will demand coordinated action and commitment from each country and the local communities, as well as from the international community. It emphasizes that in addition to a significant increase in dedicated long-term funding, new and innovative approaches to education and training are needed. Evidence is emerging about what can be done to scale up the education and training of health workers quickly and effectively.

One of these innovative approaches is the use of technology, which is becoming more accessible to developing countries and which the Alliance or a network can help to launch/promote. Various sources, along with an academic study on health informatics, revealed that necessary conditions for sustaining e-Health in developing countries include the following: capacity development, knowledge sharing, and local ownership. It was also agreed on the following needs: simple, practical, maintainable, and reliable solutions. They identified other critical factors necessary for successful initiatives: workforce, funding, basic health infrastructure, and management. Those are many of the same factors that are articulated globally for the success of scaling-up the health workforce, whether e-Health or other types of initiatives such as multi-tasking skills.

Therefore the Global Health Workforce Alliance (GHWA) is collaborating with the World Health Organization (Department of Knowledge Management and Sharing (KMS), and WHO Ethiopia), and the Federal Ministry of Health in Ethiopia (FMOH), to implement Knowledge Centers in sub-urban and rural communities in Ethiopia.

GHWA is providing the policy direction and conceptual development of the initiative, while WHO-KMS is coordinating the overall project implementation, including the packaging and delivery of knowledge services, as well as directing ICT infrastructure planning and implementation in countries. WHO Ethiopia is facilitating negotiations with the Ministry of Health Ethiopia, and contributing to the project development and implementation in light of the national health strategy of Ethiopia. FMOH guides and helps prioritize the implementation plan, including the transfer of project ownership to local communities.
3. Project Objectives/Purpose

In addition to creating partner synergy and advocating for an increase in health sector funding from national governments and externally from donors, the role of Knowledge Centers supported by GHWA, and WHO is to bring some of the new and innovative technologies to bear on addressing the problem of scaling up quickly and effectively. GHWA has taken on the role of a catalyst to provide a model that can be replicated in other countries. GHWA has already run communities of practice designed to encourage “knowledge to practice” through the Implementing Best Practice gateway that is link it multiple communities of practice which reach 190 countries. GHWA Knowledge Centers will serve as the platforms for delivering the knowledge through gateways to health workers at the local community level, particularly to those in rural areas where the shortage of health workers and the lack of knowledge and information are most severe. However, Knowledge Centers could be integrated into clinics or hospitals or other existing structures in urban areas that also have severe shortages of health workers, health knowledge and information, and/or applicable and relevant education and training resources (financial and/or human). They meet the GHWA criteria of moving learning to the community level, of increasing the use of information and communication technologies, and of promoting life-long learning of health workers. Therefore, through community based Knowledge Centres, the project will:

- Empower and enable knowledge capacity and decision making of health care workers to implement best models of practice for health care delivery services in their localities and thus support retention of health workers in their localities.
- Encourage local health care providers to engage them in research projects in a collective attempt to seek answers to problems including health, capacity-building and retention of health workers
- Motivate and generate interest among healthcare workers by affording them access to carefully selected, practicable, regularly updated and much-needed systematic reviews of health information from academically and professionally accredited journals, publications etc. in paper form and/or in a digital library or through e-Granaries.

4. Specific Activities

The Knowledge Centers are simple, practical, maintainable, and with proper energy sources, reliable. Their purpose, within the overall one of scaling up the health workforce, is capacity development through focused and carefully-designed use of knowledge and information sharing. They are designed to become integral parts of the local community.

The pilot Knowledge Centers will target community based health workers, based upon the GHWA research showing that this is the quickest way to scale up and to increase access to essential health interventions in both rural and urban areas.

4.1. The approach: the project implementation has two phases.

a) A pilot phase (Phase I: April-May 2010), where two district hospitals selected by the Ministry of Health will be equipped with appropriate computers, broadband Internet, and knowledge resources that would be hosted on local computers, as well as accessed via Internet. The facility would be managed and operated by an IT professional recruited by the hospital, who would guide and support the health workers in the community that would use the facility.

From the outset, a small core team made up of persons from the Federal Ministry of Health, WHO, selected NGOs and representatives of identified universities in Addis will form a group who will be instrumental in working with the said districts to identify learning and training needs and providing coaching and mentoring in the use of the technology and would work closely with the IT experts, health providers (users who impact clinical practice at district health facility level) and others identified at the knowledge centre sites to help
sustain the best use of the Centres. This is an important factor in sustainability of the core function of the knowledge centres since it will provide a sense of ownership at the national and local levels. WHO headquarters and other collaborators who wish to provide content for the knowledge centres can also have a point of contact at the country level.

b) Scale up phase (Phase II: 2010 – 2012): In conjunction with the national roll out plan of health information systems in Ethiopia, up to 100 districts selected by the Ministry of Health will be equipped with equipment and broadband connectivity, in which knowledge services will be provided to health workers in the regions.

At this stage of the planning process, more stakeholders can be co-opted as necessary and can include partners of the FMOH who can provide content and technical support to the network of knowledge centres. This will assist in embedding the use of the knowledge centres and in the identification of relevant learning/training material that can be tailored to suit the needs of the health professionals and other health workers using the Centres. Training on the use of the internet for on line discussions or training can be provided by WHO (in collaboration with relevant technical program support) to the core group, who in turn will provide support to the different regions. This will enhance the skills of the core group but not require any significant period of time to be spent becoming familiar with the techniques involved and technical support from programs to demonstrate clinical applicability of the information/tool in day to day practice at district and sub-district level.

4.2. Knowledge Centers as platforms for accessing up-to-date information and knowledge

Technology can help to address an issue often-articulated by rural health workers in countries with few resources: the capabilities, or lack of, for accessing up-to-date information about developments in their fields of practice, for example. Health workers will be able to access an almost unlimited number of topics related to health, medical and surgical care, public health, best practices, etc. Once they are trained in the use of the technology, health workers, for example, can search and access the information locally, during times that are convenient to the health worker, at or near the place of his/her work.

This is crucial when transportation or money for transportation to other locations to search for information (or for training) is scarce, or in the situation in which the workload makes it impossible for the health worker to leave his/her post.

4.3 On-site and digital libraries

The Knowledge Center is not a library, although on-site and digital libraries are crucial components (in addition to the capabilities to search the web for information). There are several options already in existence, including the WHO Blue Trunk and the e-granary digital library and others. On-site libraries must be kept up-to-date and be easy to use; methods already exist to do this. The library is one component of the Knowledge Center that can be used by the community at large, in addition to its use by health workers, and therefore is important in the establishment of “ownership” by the local communities. A by-product is more knowledge and information gained by local community members about ways they can help to protect their own health (or learn more about the importance of environmental factors and their health, for example). [Training members of the community to use the library will be one function of those who staff the Knowledge Center.]

4.4 Platform for “real-time,” cost-effective, collaborative training/learning

a) Discussions with peers

A Knowledge Center equipped with the proper technology is a multi-disciplinary, multi-sectoral platform. One of the activities the platform(s) will support is connection of the Centers for “real time” discussion with other health workers, whether in-country or inter-country, on problems and issues they face and the sharing of ideas and/or
suggested methods for solutions. They can share information about “what works” and “what doesn’t work” (and why) from their own experiences. The uses of E-illuminate, Skype or similar systems allow this communication at little to no cost and are “user-friendly.” Providing and facilitating such discussions with peers will help to foster (even if virtually) a sense in the health worker of “I am not alone” as he/she face the issues.

b) Training sessions or classes

It is also possible through the types of systems cited above to connect health workers at various locations for actual class sessions, as one avenue for health worker in-service training. More traditional “distance learning” courses will be available as well (without connectivity to a “real time” class) to allow a health worker to pursue a course or online training session at a time that complements his/her work schedule instead of competing with it. In addition, classes can be taught on-site at each Knowledge Center. A particular class or training session can be held “in person” by local or external trainers for a particular cadre of health workers. [Each Center will be equipped with tables/desks, chairs, computer/projector for presentations, chalk or white boards, and the necessary aids and materials (markers, pens, chalk, paper, etc). Live, on-site training also is dependent upon a reliable energy source, or backup source, such as solar panels.] The Knowledge Centers will help to fulfill the GHWA criteria of fostering in-service training and life-long learning for health workers. At the same time, the providing of training on-site or near where the health worker is employed maximizes the opportunity cost over the off-site (away from workplace) education and hence, minimizes disruption of the delivery of care and has a quicker introduction/implementation of best practices at the point of care.

c) Research

There are opportunities for many types of research at each of the Knowledge Centers, plus the added opportunity of comparative research once there are several Centers in place in the pilot program. For example, if educational institutions are involved in the training at the Knowledge Centers, it is highly probable that faculty members from those institutions are conducting research which could involve the Centers. When health workers who participate in the Knowledge Center programs, or staff of the Knowledge Center, are trained in research skills, they could join with members of the local community in community-based participatory research (CBPP) on topics that are of importance relating to health issues in the community (educational institution faculty perhaps would be interested in joining as well.

There is the consistently-stressed need for HRH research, including the capacity to collect and act upon health sector research findings, as stated by GHWA. The Knowledge Centers provide the opportunity to help to build that capacity in members of the health workforce by teaching research skills to community-level health workers, while at the same time providing the opportunity to gather HRH data and availability of a working environment (health facility data) at the grassroots level of the health system. There also is the opportunity to gather data about health workforce training and information and the effectiveness of the trainings provided at the Knowledge Centers. As more Knowledge Centers are established, the greater the opportunity for comparative research on these issues.

Clinical data and epidemiological data gathering and analysis are other examples of what is possible at a Knowledge Center located within a local community.

5. Regional Partnerships and Center of Excellence

At the outset of the pilot program, one possibility is to partner a country that has begun work on its Human Resources for Health (HRH) country plan and scaling up its workforce with a country or countries in the same region (or continent) that have not progressed to the same level to date. It would be feasible, for example, to partner Ethiopia (with its extensive work in developing Health Extension Workers and many active international donors interested in HRH together will the existing and planned roll out of a computer network at health facilities at the district level) with other countries supported by GHWA and thereby create synergies with other GHWA programs.
6. The main activities:

- Conduct the following types of activities:
  - training of trainers (T.O.T.)
  - blended learning,
  - face to face teaching of selected health intervention modules and distance learning,
  - addressing specific issues that are of relevance both to health workers in situ and based on the country profile which can include: HIV/AIDS, Tuberculosis, Malaria, Maternal and Child, Emergency and Surgical Care, Epidemiology, Public Health, Mental Health, Public Health Management or Research in that region or locality (the list is not exhaustive).

7. Results/Outputs

- Provide an agreed percentage (with the Ministry of Health) of health care workers in the catchment area access to sustainable continuous professional development materials/tools through ICT.
- Continuous updates of the materials in the Knowledge Center.
- Increased ability of the health care workers to replicate or design research specific health interventions, including HRH research.
- Increase motivation of the healthcare workers to present their research proposals for funding and incentives.
- Sharing the results of the research for continuous medical and health worker education, knowledge exchange.
- Increase availability of well-trained healthcare workers to combat shortage or perform higher functions, when appropriate, and encourage retention of health workers in their local facilities.

8. Monitoring and Evaluation

A quantitative and qualitative evaluation of the project will be carried out to measure the achievements of the project vis-à-vis the expected results. The measurement will cover processes, from pre-implementation to post-implementation, and long term usage of the ICT-based Knowledge Center by health workers. The M&E will report the health outcomes based on indicators, taking into account the project objectives (para 3) and expected results (para 7). It would also measure user satisfaction and implementation of best practices information, through interviews or workshops.

Annex 1 lays out some of the ways in which monitoring and evaluation can undertake. These can be combined with other measures for monitoring such as: the keeping of a log-book which records the persons using the centre, their profession, where they are located, (e.g. the hospital or health centre), date and time; tracking the use of the internet; short, periodic on-line questionnaires about the benefits of the use of the knowledge centre (related to the objectives and outcomes) with the attendant demographic details of users. It would also be of importance to measure user satisfaction through workshops when this can be integrated into distance learning.

The responsibility for monitoring and evaluation can be taken on by the core team with the involvement of persons designated by the team at the facility where the knowledge centre is located.

9. Implementing agencies: WHO, in close consultation with GHWA, and in collaboration with FMOH and beneficiary regions and districts in the country, will be responsible for the implementation of the project.
10. Monitoring Indicators for the use of the Knowledge Centres

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Monitoring Indicators</th>
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<tbody>
<tr>
<td>Empower and enable knowledge capacity and decision making of health care workers to implement best models of practice for health care delivery services in their localities and thus support retention of health workers in their localities.</td>
<td>Number of training courses run per year via IBP gateway.</td>
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<tr>
<td></td>
<td>Frequency of internet use.</td>
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<td></td>
<td>Number of health workers of different categories participating in on line discussions (e.g. communities of practice).</td>
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<td></td>
<td>Number of health workers using the knowledge centre on a weekly basis.</td>
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<td></td>
<td>Evidence of knowledge to practice through interviews with users of the Centre.</td>
</tr>
<tr>
<td>Encourage local health care providers to engage them in research projects in a collective attempt to seek answers to problems including health, capacity-building and retention of health workers</td>
<td>Number of research projects using data accessed via the knowledge centre.</td>
</tr>
<tr>
<td>Motivate and generate interest among healthcare workers by affording them access to carefully selected, practicable, regularly updated and much-needed systematic reviews of health information from academically and professionally accredited journals, publications etc. in paper form and/or in a digital library or through e-Granaries.</td>
<td>Number of electronic journals accessed (internet hits).</td>
</tr>
<tr>
<td></td>
<td>Interviews to ascertain access to systematic reviews and benefits from accessing them.</td>
</tr>
<tr>
<td></td>
<td>Availability of e-Granary/Digital Library and updates.</td>
</tr>
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