



**UiO : Institute of Health and Society**  
**University of Oslo**

**PhD research protocol**

**Free digital health education for diseases of public health importance (HIV / AIDS, Tuberculosis and *Taenia solium* cysticercosis/taeniosis) in Iringa, Tanzania**

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## Project summary

Increased health education has the potential to facilitate better use of health care services and to promote early treatment, thus it can strengthen the health care system, and ultimately reduce morbidity and mortality. In this study, we will develop and test the effect of digital health messages related to HIV, Tuberculosis (TB) and *Taenia solium* cysticercosis/taeniosis (TSCT) (the intervention diseases) in Migoli and Izazi (the intervention villages), in Iringa, Tanzania (TZ).

The intervention is planned as follows: A digital platform, providing the intervention villages with digital health messages related to the above-mentioned diseases, will be implemented in TZ in 2019. The platform will be accessible free of charge, through own devices and tablets based in the local Wi-Fi spots in the villages.

In the first part of the PhD-project, the doctoral research fellow will participate in developing the digital health messages, together with experts from the medical and teaching environments in Tanzania, Norway, Germany and USA.

The second part of the PhD-project consists of a cluster non-randomised controlled trial and semi-structured interviews in Tanzania. The digital health messages will be physically shown to the participants in the intervention group. The study is planned to investigate the knowledge related to the intervention diseases, before the intervention, immediately after exposure to the intervention, and at follow-up points throughout one year, after the intervention has been implemented. Semi-structured interviews with clients (users of the intervention) from each of the intervention villages are included, to explore the perception and reception of the intervention.

The baseline study and the immediate after survey will take place in Tanzania in Q1 2019, while the other follow-up studies and interviews (3, 6 and 12 months after baseline) will be undertaken throughout one year.

## Introduction

This protocol is registered in Helseforsk, University of Oslo, and the project has been assessed by Norwegian Centre for Research Data (NSD), ref. number 59643. Ethical approval from the National Institute for Medical Research (NIMR), Tanzania, has been granted with the reference number NIMR/HQ/R.8a/Vol IX/2947.

The PhD-project consist of three work packages: WP1: A systematic review and meta-analysis, WP2: A cluster non-randomised controlled trial and WP3: Semi-structured interviews with clients in the intervention group. Only WP2 and WP3 are elaborated upon in this protocol.

The planned PhD-project will be included as a health-research component in the Norwegian Government- and Norwegian Research Council- funded innovation project "*Non-discriminating access for Digital Inclusion*" (DigI). The project runs from January 2017 to September 2020. Altogether 11 partners<sup>i</sup> from eight countries are collaborating on the project. Professor Josef Noll from the Dept. of Technology Systems (ITS), University of Oslo (UiO), is the project owner, and the doctoral research fellow's co-supervisor. Responsible for the health-research component and main supervisor of the doctoral research fellow, is Professor Dr. Andrea Winkler at the Institute of Health and Society, UiO. Head in TZ, is Dr. Bernard Ngowi (HIV/AIDS and TB specialist) from NIMR and Associate professor Helena Ngowi (TSCT specialist) from Sokoine University of Agriculture (SUA). Associate professor Maurice Isabwe from Dept. of Information and Communication Technology at University of Agder is head of developing the digital health messages. This study is thus multicentre with several institutions responsible for research.

In Tanzania, DigI will facilitate a digital health education platform, where digital health messages related to HIV / AIDS, Tuberculosis (TB) and *Taenia solium* cysticercosis/taeniosis (TSCT) will be transferred to the community; hereby called clients, defined by the World Health Organization (2017) as "*members of the public that are potential or current users of health services, including promotion activities*"<sup>1</sup>.

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<sup>i</sup> The partners are: Basic Internet Foundation, The University of Oslo, Orange, Ministry of Health (TZ), National Institute for Medical Research (TZ), Sokoine University of Agriculture (TZ), Mondragon University (Spain), Global Health Media Project (US), IPX Extenso, Future Competence and Motivation

The digital health messages will be accessible at a Wi-Fi spot in the local village close to the local health post. The digital health messages will also be shown face-to-face to each of the participants in the intervention group, by enumerators in the research team from SUA and the doctoral research fellow. The intervention will be available for all clients in the intervention villages, not only for the participants in the study described in this protocol.

The intervention will be maintained by NIMR Muhimbili Centre in Dar es Salaam during the first phase, but is going to be managed as a sustainable business model where a local sales man or woman is selling vouchers to access the World Wide Web. NIMR have close contact with the village authorities and health workers in the intervention villages, and will be alerted if the intervention for some reason is not functioning. The Wi-Fi network that provides the access to the digital health education platform, reaches within a radius of 50 meters, and is driven by a solar panel. This means that the intervention will be accessible even if the electricity locally shuts down.

## Background and Rationale

Today's education channels are changing, thus health education interventions must meet the target population at their own level of technology,<sup>2</sup> and further do rely upon the characteristics of the technology available.<sup>3</sup> A useful tool to deliver education and improve health seeking behaviour and health-related lifestyle decisions, is mobile technologies, because they make people more contactable.<sup>4</sup> Health seeking behaviour may change after the target group has been exposed to adequate health messages that provide relevant information to the target population,<sup>5,6</sup> thus digital health information can contribute to prevention and management of diseases.<sup>7</sup>

### Digital health and digital health education

Digital health is defined by WHO (2016) as *"The use of digital, mobile and wireless technologies to support the achievement of health objectives. Digital health describes the general use of information and communications technologies (ICT) for health and is inclusive of both mHealth and eHealth"*<sup>8</sup>. eHealth is defined by the WHO (2005) as *"the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research"*<sup>9</sup>. mHealth is a component of eHealth, and commonly referred to as the use of mobile and wireless technologies for health. WHO (2011) defines it as: *"medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices"*<sup>10</sup>.

Health behaviour change may reduce the burden of preventable disease and death around the world, *"as health education covers the continuum from disease prevention and promotion of optimal health to the detection of illness to treatment, rehabilitation, and long-term care"*<sup>11</sup>.

The use of eHealth is now understood as central in order to provide more care and better care to more people, especially those most in need.<sup>12</sup> A key part of the Sustainable Development Goal 3 relates to reaching people with the information they need in order to live healthier lives, and eHealth is regarded as a tool to reach the public with health messages and support, as well as encouraging clients to take active roles in their health and wellbeing (ibid).

The use of smart devices and mobile data services are rapidly changing, and it is likely that an increasingly part of the population in for example Sub-Saharan Africa will have access to both in the future.<sup>13</sup>

### Focus diseases

Creating awareness of prevalence, causes / transmission, symptoms, how to treat and prevention of diseases, aiming to provide early treatment and increase appropriate use of health care services in rural areas in the global south, is important in order to reducing infectious diseases like HIV/AIDS, TB and zoonotic diseases like TSCT. In lower income countries (World Bank classification) 60% of the population live in rural areas.<sup>14</sup> These are hard to access populations, due to underdeveloped infrastructure and resource poverty, which need the

health education already available.

Related to this project, the spread of information regarding the following diseases will be essential:

### **HIV/AIDS**

In sub-Saharan Africa, AIDS is the leading cause of death among teenagers,<sup>15</sup> and 25.6 million people in Africa are living with HIV in 2016.<sup>16</sup> Quality information, rapid diagnosis and early treatment and care are essential to control the virus and help prevent transmission to others.

### **Tuberculosis (TB)**

TB treatment saved 49 million lives globally between 2000 and 2015, but despite TB being both treatable and curable, 1.7 million people are dying globally from the disease, each year.<sup>17</sup> The most efficient way to save lives is to diagnose and treat TB as early as possible.

### ***Taenia solium* (neuro)cysticercosis/taeniosis (TSCT)**

TSCT is an emerging but neglected parasitic and zoonotic disease, caused by the tapeworm *Taenia solium*. In humans the disease manifests itself mainly as neurocysticercosis (NCC) - the most frequent preventable cause of epilepsy in sub-Saharan Africa.<sup>18</sup> TSCT has been listed as a priority disease for international attention towards elimination, to alleviate poverty.<sup>19</sup>

Messages on Anthrax, Cholera and maternal and new born health will also be available, but they are not part of this particular PhD-project.

## **Objectives**

The overarching objective of the study is to acquire new knowledge within the field of digital health education / digital health promotion and health literacy of clients in Iringa, Tanzania. The study will employ both quantitative and qualitative methods (mixed method) of data collection and analysis. The primary objective of the PhD-project is to develop, describe and understand the use of a digital health literacy intervention, and its effect on health literacy outcomes in Migoli and Izazi, Iringa, Tanzania.

### **Main objectives in WP 2**

- Assess the effect of the digital health intervention, related to knowledge uptake and knowledge retention by assessing the knowledge score before and after the intervention, in both groups.
- To investigate if the intervention increase health literacy related to the intervention diseases among the clients that cannot read.

### **Main objectives in WP 3**

- Explore the reception and perception of the intervention among the users, by semi-structured interviews.

The doctoral research fellow will strive to present and review the findings from the research within the Sustainable Development Goals (SDGs),<sup>20</sup> as over-arching framework. There are especially two goals of major importance related to this study: SDG 3 *Good health and well-being*, and SDG 9 *Industry, innovation and infrastructure*.

One of the targets in SDG 3, states that they are making a bold commitment to end the epidemics of (among others) HIV/AIDS and TB by 2030. Another target emphasizes to strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.<sup>21</sup> Bridging the digital gap is an important task related to targets of SDG 9. They state among other targets: “*Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020*”<sup>22</sup>. The DigI project directly addresses this target through the aim of free access to information for all. The free access to information is also the catalyst for several other SDG goals (4, 8, 10 and 11).

## **WP 2 –A cluster non-randomised controlled trial**

The overall strategy chosen is a non-randomised controlled trial, with a two-stage cluster sampling. The study will be conducted in four villages in Iringa district in Tanzania, assessing the effect of digital health messages related to HIV / AIDS, Tuberculosis (TB) and *Taenia solium* cysticercosis/taeniosis (TSCT).

The aim of the digital health intervention is to contribute to increased health knowledge of the clients that has the potential to facilitate better use of health care services, and to promote early treatment, thus to strengthen the health system.

Hypotheses: We hypothesize that the intervention increases the proportion of correct answers, related to the intervention diseases, when comparing pre and post knowledge scores, also among clients that cannot read.

We will measure if the intervention leads to an increase in the number of correctly answered questions, from 21 out of 42, to 28 out of 42 (equivalent to 16,7 % increase) questions from the study questionnaire, during the 12-months intervention in the intervention group compared to the control group.

### **Methods and study design**

Iringa district was selected because the prevalence of all three diseases is high, and the areas are known to be endemic, in addition to being a rural district with mainly unconnected villages. The intervention villages were conveniently chosen at an early stage<sup>23</sup> in the DigI project, thus randomization of the participants to intervention / control groups will not be feasible. The intervention group, group 1, consists of randomly selected participants from the villages Izazi and Migoli.

Izazi village is not connected to internet, while Migoli has recently been connected through 3G. According to the village authorities, 3G is not used for health information.

The control group, group 2, consists of randomly selected participants from the villages Kimande and Idodi. These villages are candidates for the 7 next villages to get access to the digital health platform, in the DigI project phase II. The control villages are both located at least 70 km away from the intervention villages, and have at least three villages in between, in order to hinder contamination between the two groups.

Around 494 participants (15-70 years of age) will be included in the study. The study will take place at randomly selected households in the four villages. The ten-cells (sub-villages with up to 50 households) will be the clusters and randomization will occur at ten-cell and household level. Group 1 will receive a 12- months intervention, and group 2 will function as a control group and will get usual information through the village health posts available resources (see the section on control group below). Study variables will be measured at baseline, immediately after exposure to the intervention, 3, 6 and 12 months after exposure. The main outcome will be knowledge uptake and score after intervention, and scores related to retention of knowledge throughout the year.

### **Development of the intervention- Development of digital health messages**

In collaboration with the Tanzanian, German and American partners, we will develop the intervention that consists of digital health messages for the digital health education intervention, converting traditional learning material into a digital format such as a video, including sequences with interactive questions. When the enumerators and the doctoral research fellow are in the field, they will carry personal electronic devices; tablets. The tablet will contain both the videos and the digital questionnaires to be used in the surveys. The digital health messages will focus on public health important diseases in a Tanzanian context. The diseases have been selected after a need assessment locally, with the Tanzanian partners, and are diseases of public health importance. The digital health messages will address prevalence, causes / transmission, symptoms, treatment and prevention for HIV/AIDS, TB and TSCT. The local medical experts on the intervention diseases have pointed out key messages in traditional written material (some leaflets and some presentations), and the content is being reshaped and digitalized, before approval from the Ministry of Health Community Development, Gender, Elderly and Children (MoHCDGEC) in TZ will be sought to approve the health messages. The pedagogical strategy in the digital health messages is Micro-learning, applied to informal learning, which

enables users to learn without information overload, by the combination of micro-content with a sequence of micro-interactions. The micro-content will consist of the digital health message, and the micro-interactions will be the interactive questions that follow a key message. While developing the health messages, a constructive alignment approach is adopted, derived from the constructivist learning theory. This theory of learning can be summarized as following: First comes the key message – for example the health video that the client is watching on the device. Thereafter comes some digital questions, directly related to the key message. After the question is answered, the video continues. The outcome is presented first, and then the teaching and assessment are aligned to the outcomes. The learner's activities in creating meaning are central in this theory. The aim is that the digital health messages bring short important messages out to the target population, and that the clients can use this information to make good choices regarding own and family health.

In order to maintain the essential aim of the DigiI project, to give non-discriminating access to basic information, the digital health messages will also target the illiterate. Voice-over will be used, and the language will be Swahili. The viewers will not be asked about own health, rather their knowledge related to the intervention diseases. The questions in the videos will be the same questions as in the questionnaire.

### **Control group**

Participants from the control villages will serve as the control group and will be informed to live as normal. No restrictions or expectations will be given with respect to behavior change or information seeking, so they can continue the standardized care they get from the health information services.

### **Recruitment and participants**

The research population is people living in the selected villages, the study units are individuals, but only people over 15-70 years old are eligible for participating in the study. This is a two-stage cluster where the intervention villages initially were sampled by stratification, and two-stage sampling frame will be undertaken at a ten-cell and household level. The number of households within the ten-cells will be selected by the size of the ten-cell, according to the Probability Proportional to Size. In the randomly chosen households, 3-4 household members will be interviewed all together five times. Ten-cell and household lists will be used for randomisation in both groups.

A baseline survey conducted in both groups will determine the knowledge with regard to the diseases in the groups before the intervention is implemented.

In group 1, the random selected sample of people, previously naïve to health messages delivered by the DigiI project, will be given the intervention physically, as they will be shown the digital health messages at the researchers/ enumerators tablets. This is to make sure that all the participants in group 1 will actually receive the intervention, in order for the analysis to be able to indicate the overall effect of the digital health messages. All the participants in group 1 will be informed that the intervention is available for all, at all times, in the local Wi-Fi spot, however, we cannot be certain that the participants will use the intervention more than the first exposure by the enumerators.

Group 1 will, immediately after the exposure to the digital health messages, be asked the same questions as in the baseline questionnaire. 3 months, 6 months and 12 months after first exposure to the intervention, the questions will be repeated to the same participants.

Inclusion criteria:

- Living in the selected household (15-70 years), at least for the past six months, and at least planning to not move the next 12 months.
- Must be capable and willing to sign written informed consent and thumb-print for illiterate participants

Exclusion criteria

- Planning to be out of the village for more than 6 weeks in the next 12 months
- Those above 71 or under 15
- Not capable of signing consent letter (very sick)

In order to financially conduct the study, a cluster design is chosen over an individually randomised sampling procedure. The research group will be in contact with the participants five times, and it would demand increased financial resources if all ten-cells in the villages would be included. Even if the villages are not overwhelming in size, the populations are spread out over large areas.

To reduce contamination between intervention and control participants, the villages in the intervention and control groups are located at different geographical locations.

**Data collection and instruments**

The research team will have training prior to fieldwork. The doctoral research fellow will be in charge of training with regards to use of tablets, interviewing the participants, submission of digital questionnaires and uploading of the personal identification code (described below). The training will take place in Morogoro, at SUA.

**Study tools**

Enumerators from SUA and NIMR and the doctoral research fellow will collect the data in the field. The first round will consist of localizing the participants and the baseline study. Health message provision to participants in group 1, and the immediate after questionnaire, will follow in the intervention villages. The survey will start in Migoli, then Izazi, and then continue to the control villages, Kimande and Idoli. The first follow-up will start three months after exposure to the intervention, the second will start six months after, and the final follow-up will start 12 months after expose to the intervention.

When collecting the data through the questionnaire, an android app, KoboCollect<sup>24</sup>, will be used. The questionnaire has been developed in KoboToolbox<sup>25</sup>, a software for field data collection in challenging environments, developed by Harvard Humanitarian Initiative<sup>26</sup>. This is a free, open source tool that allows their users to create and employ questionnaires, to be used in the field without Wi-Fi, 4G, 3G or other connectivity to internet.

Accessing KoboToolbox can only be done with username and password. The questionnaire will be shared with other users, the enumerators, who only will be able to submit data, but not access the collected information. When tablets are online the app will automatically synchronize the collected data to the online platform, KoboToolbox. After each survey round the information will be transferred from KoboToolbox to UiO’s Services for sensitive data (TSD) and a server at NIMR, and deleted from KoboToolbox. This is described further below. The digital questionnaire contains questions to be checked off at the tablet. The language in both the digital health messages and the questionnaire will be Swahili. In the first survey round, the participant will be asked about demographic information. This personal information; name, sex, age, mobile number, village and GPS coordinates, will be registered on the household list, and not in KoboCollect, nor uploaded to KoboToolbox, in order to reduce privacy information risk. A Digital Object Identifier (DOI) will be created to each participant, and the DOI will be registered in KoboCollect together with age segment and sex. Thus, no personal information will be uploaded to KoboToolbox. The personal identification key will be stored directly in TSD via the tablets, and will not be sent through email.

Tools to be used in the field	
A personal device, the tablet, containing:	Household lists, containing:
<ul style="list-style-type: none"> <li>• A digital questionnaire (KoboCollect) with:               <ol style="list-style-type: none"> <li>1. DOI, Age segment, sex</li> <li>2. 14 knowledge questions on HIV / AIDS</li> <li>3. 11 knowledge questions on TB</li> <li>4. 17 knowledge questions on TSCT</li> <li>5. 5 questions on digital literacy</li> <li>6. 6 questions on general health literacy</li> </ol> </li> <li>• Digital health messages.</li> </ul>	<ul style="list-style-type: none"> <li>• The personal identification key (household lists) with:               <ol style="list-style-type: none"> <li>1. DOI</li> <li>2. Name</li> <li>3. Sex</li> <li>4. Age</li> <li>5. Village</li> <li>6. Mobile number</li> <li>7. GPS-coordinates</li> </ol> </li> </ul>

Table 1

The reason for asking the participants for their names, mobile number and GPS is to be able to re-locate the participants in the follow-up surveys. In the follow-ups, the research staff will carry lists with GPS-coordinates,

together with names and DOIs. When entering the data from the follow-ups, the enumerators will only have to identify the participants according to the list, and use the DOI when collecting data.

In the follow-ups, the participants will be asked if they have used the intervention, at the local Wi-Fi spot, and if yes, how many times in the previous (three/six) months. This will provide information on the actual use of the intervention.

**Sample size calculation**

The data will be gathered from Migoli village, Mtera ward and Izazi Village, in Izazi ward (both in Iringa, population 10.036 and 2.567 people), in addition to the control villages, Kimande village in Pawaga ward and Idodi village in Idodi ward, also in Iringa district. After internal discussion in the DigI group, it is assumed that the people would have 21 correct answers out of 42 questions in total, if they were

Sample size per village			
	Population	Proportion	Sample
Migoli	10036	0,79	195
Control village 1, Kimande	3000	0,55	135
Izazi	2657	0,21	52
Control village 2, Idodi	2500	0,45	112
N	18193		
Sample			494

Table 2

asked questions from the questionnaire today. It is further assumed that the intervention will increase the number of correct answers to at least 28 of 42. The sample size calculation is to be found in appendix 1. The power of the study was set to 80%, the drop-outs calculated to be 20% and the cluster correlation was set to 1,5. After calculating the sample size, the proportions to each village was allocated, see table 2.

After ethical approval from NIMR is granted, the questionnaire will be piloted in a village near Morogoro to see how it corresponds with the assumed proportion mentioned (at least 21 correct answers out of 42).

**Data management and statistical analysis**

A data management plan is being developed using a tool from the Norwegian Centre for Research Data (NSD). UiO is responsible for the data stored in TSD. The de-identification code will be stored separately in TSD, and deleted in 2022. After this, the anonymous data will be kept in NSDs archives, for re-use purposes.

The data will be analysed in TSD, by multilevel models to address the dependency related to cluster trials. Summary tables with calculated averages (mean, median, and mode), will be created. The baseline knowledge scores will be calculated with data from the first survey. The doctoral research fellow will compute an overall score for each section (prevalence, cause/transmission, symptoms, treatment and prevention) at individual and village level, based on the answers to the questions. Then a comparison between intervention groups and between intervention and control groups will be made. Data from the follow-ups will also be analysed in TSD accordingly.

After data collection is completed the GPS data will be able to illustrate the use of the intervention, related to distance from household to Wi-Fi spot and frequency of use. In this planned illustration, no direct households will be identified, but rather summarize on village level the frequency of the use of the intervention.

**WP3 - Semi-structured interviews**

In order to get complimentary qualitative data, 8-10 semi-structured interviews with clients from the intervention villages will be conducted. The main aim is to get people to reveal their own perspectives related to the intervention.<sup>27</sup>

The research question reads as follows: How is the intervention perceived and received among those who use it in the intervention villages?

Semi-structured interviews allow the doctoral research fellow to have an informal tone with the informants, and it adds meanings, values, feelings, personal experiences and points of view to the research. A checklist will be prepared to steer the conversations and make sure that no question remains unanswered or unclear. The interviews will be held with clients in the intervention villages, in English if possible, otherwise in Swahili with a translator. This is to provide in-depth information on how the intervention is perceived and received



among the people who actually use the intervention locally. It can also shed light on the possible effects of the intervention, raise specific issues, opportunities and problems, and provide a different view on the use of the health messages. The interviews can also work as a discussion arena and a strategy of validity.

The participants will be randomly picked from the same lists as in WP2. The semi-structured interviews will be recorded with the recording app from TSD, and transcribed thereafter. The records and transcription will be held separately from the de-identification code, both in the TSD. The de-identification code will be deleted two years after the overall project is finished. After this, the data will be kept anonymous in the NSD archives. When analysing and summarizing the interviews, a table will be made that excerpts the most important findings from the qualitative research, together with quotes from the interview.

## **Ethical considerations**

Ethical approval will be sought from the Medical research coordinating Committee (MRCC) of the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) in TZ. The safety of the study participants will be assured. Permission to participate in the study will be asked from the study participants. Data on actual harms in digital health interventions are relatively sparse.<sup>28</sup> In this study, we will state to all participants that they can withdraw any time from the surveys. All the digital health messages will be ethically approved by the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) in TZ. This will contribute to minimize the risk of promoting harmful messages.

We will follow ethical and legal practice and all information about the participants will be handled in confidence and will remain de-identified until two years after the overall project has ended. In 2022, the de-identification code will be deleted, thus the material will be kept anonymous for public re-use. Informed consent forms are developed according to templates from Regional Committees for Medical and Health Research Ethics (REK), Norway and NSD.

A possible benefit for the participants in the survey is a greater knowledge on the high-endemic diseases of HIV / AIDS, TB and TSCT. A benefit for the control villages will be to receive the digital health intervention in the phase II of the DigI project. The protocol has been approved by NSD and the doctoral research fellow is applying for ethical approval from the NIMR, before research permit at Tanzania Commission for Science and Technology (COSTECH).

## **Quality assurance**

The project will be registered in the ClinicalTrials.gov after approval from NSD in Norway and NIMR and in TZ. Even if this is not a clinical trial, it is a controlled trial, and registration of all health studies is now recommended by the World Medical Association. UiO procedures for quality assurance, the core values when planning, carrying out and reporting the research, will be followed. The doctoral research fellow commits to following the authority's regulations, and will adhere to international standards for conducting clinical trials, and further make sure that subcontractors and partners are in line with the same regulations. Every person who has access to the research material will have to consent to confidentiality. These agreements will be developed and uploaded to Helseforsk, which is part of UiOs internal quality assurance and control system. The doctoral research fellow together with the supervisor will review the project documents in Helseforsk every six months. In order to meet national guidelines for collecting and managing personal sensitive information, KoboToolbox and KoboCollect are currently being risk assessed by professor Josef Noll at the ITS.

## **Budget**

The study is being funded by DigI (NFR-ID: 267558, UiO-project number: 144497). The budget frame for the cluster non-randomized controlled trial in Tanzania is estimated to be 82,3 MTZS. The DigI funding will cover the costs for the research staff / enumerators from SUA and transport from NIMR, and the doctoral research

fellow will cover own costs related to the study with project funding from the position at UiO, in addition to funding from the DigI project. Two detailed budgets are to be found in appendix 2 and 3.

### **Cooperation institutions/project group**

A detailed list of contributors can be found in appendix 4.

### **Potential risks related to the study**

The doctoral research fellow is aware of the potential risks linked to implementation of both the intervention and the research. Politically, Tanzania is stable; however, other risks, such as natural disasters, may occur everywhere. In this case, the doctoral research fellow will have to adapt, and use the year of data collection wisely. In case of major disasters or unforeseen events of great importance, the protocol will have to be rewritten.

### **Publications in scientific journals**

The research in the DigI project consists of the described PhD-project in addition to another PhD-project at SUA (focusing on porcine cysticercosis), and possibly a post-doc project at SUA. These three projects represent the health research component of DigI, and are linked to allow for free information about the intervention diseases in the overall project. The results from the WPs will be published in international, scientific, peer-reviewed journals. We are aiming at publishing four articles from this study. The doctoral research fellow suggests these working titles of articles to be submitted for publication in scientific journals:

- The digital health transition: Converting traditional learning material into a digital format (not first author)
- The effect of a digital health intervention in Iringa, Tanzania: The change in health literacy related to One-Health diseases, particularly TSCT
- The effect of a digital health intervention in Iringa, Tanzania: The change in health literacy related to HIV/AIDS and Tuberculosis
- Experiences from implementing a digital health intervention in Iringa, Tanzania: Semi-structured interviews with clients

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