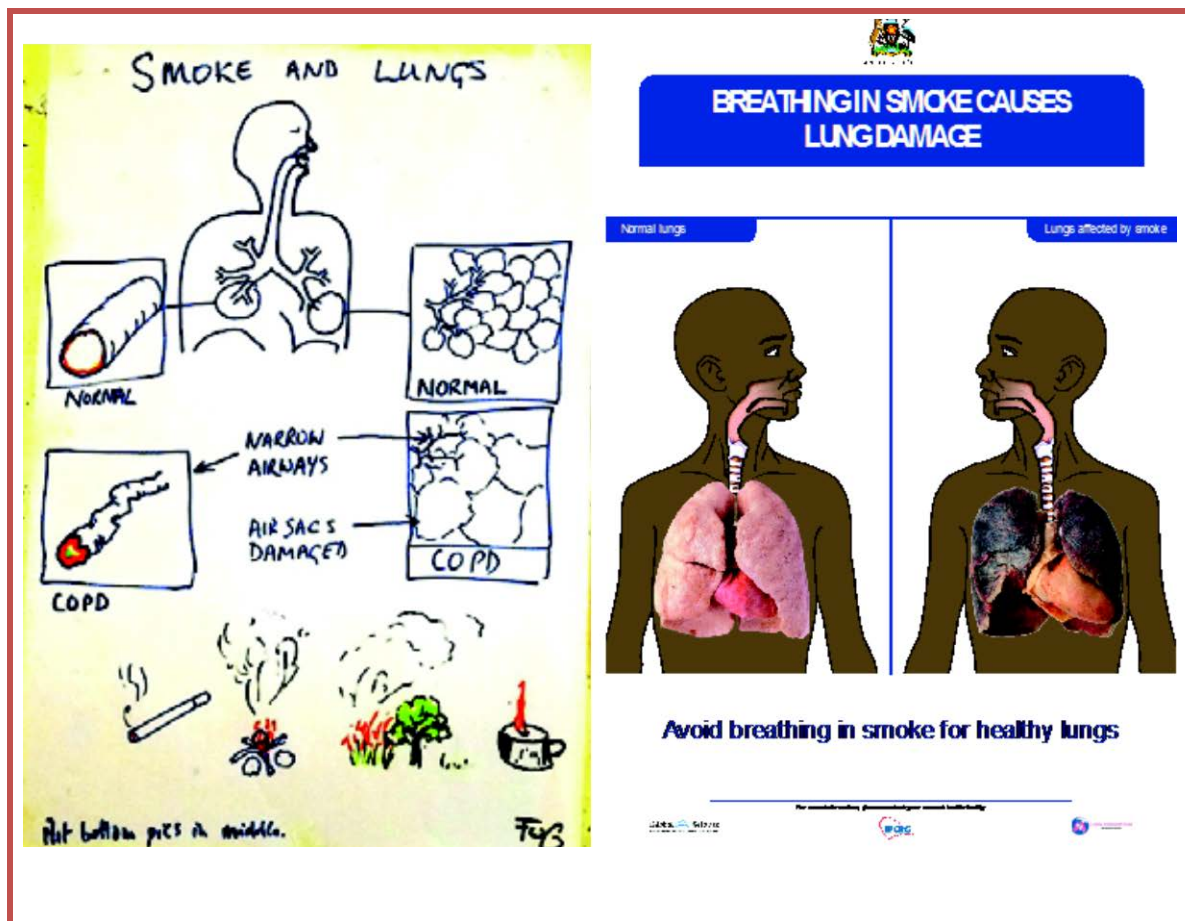


Training community health workers in rural Uganda to introduce stop smoking interventions in the context of a lung health awareness campaign



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Final Project Report

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ABSTRACT

Background:

Following a survey in rural Uganda which found 16% of the adults population had COPD, we developed a smoking cessation and lung health awareness programme to detect and prevent chronic lung disease.

Methods:

A 2 year train-the-trainer programme was conducted by health care workers (HCWs) led by the District Health Officer (DHO) in Masindi district. We held a series of meetings to develop the project strategy and the education materials including senior clinicians, the Minister for Health and DHO in Masindi and all grades of clinicians including village health teams (VHTs) and villagers. Incorporating all feedback in an updated programme, the first group then taught other HCWs. Educational materials covered: "What is lung health?", "How the lung gets damaged?", "Smoking cessation" and "Preventing harm by reducing exposure to tobacco smoke and biomass smoke". We designed and broadcast local radio messages. We evaluated knowledge questionnaires before and after training for both HCWs and the community.

Results:

Educational materials for use in training HCWs and VHTs using flip-over charts, and posters have been approved by the Ministry of Health. We trained 12 HCWs who then trained 47 HCWs, and over 100 VHTs. We have developed and administered knowledge questionnaires. Approximately 15,000 people have been educated directly and thousands more through mass media messages.

Conclusions:

Using a ground upward approach we involved the local health care systems and HCWs to develop a train-the-trainer programme in smoking cessation and lung health. The educational materials are available to local national and international use.

Purpose

The goal of this project was to train community health workers (CHWs) and health care workers in Masindi District in rural Uganda about lung health and to develop educational materials for them to use in raising awareness, intervening to stop tobacco use and promoting other actions to improve lung health in their local communities.

The objectives of the project were to:

1. Develop a cascading and sustainable 'train the trainers' module that will be used to train Masindi District community health workers (CHWs) and health care workers in improving lung health including facilitating stopping tobacco use and reducing exposure to indoor biomass smoke.
2. Create with CHWs educational materials that they can use with their local communities to support people to stop using tobacco and reduce their other risks to lung health problems.
3. Train CHWs and health care workers in supporting people to stop using tobacco through interventions that are adapted to the local cultural and economic conditions and are feasible to implement in the context of Masindi District.
4. Provide on-going support to CHWs using mobile telephone technology.
5. Integrate these activities into a larger International Primary Care Respiratory Group (IPCRG) supported programme to improve lung health including physical activity and rehabilitation.
6. Identify and share the learning from the project using the Global Bridges network and the IPCRG knowledge platform in order to build capacity for interventions that facilitate stopping tobacco use in other low and middle income countries (LMICs).
7. Contribute to developing the evidence base on effectiveness and cost-effectiveness of interventions to facilitate stopping tobacco use in LMICs.

This project addressed the pressing need to educate people in Masindi District in Uganda about the dangers of tobacco use and exposure to second hand smoke. Because we identified high levels of exposure to other forms of indoor air pollution including biomass fuel smoke and smoke from drying tobacco leaves, education addressed these factors too. Therefore, we adopted a holistic lung health approach which encompassed the full range of risk factors and associated causes of mortality and morbidity, including chronic obstructive pulmonary disease (COPD), lung cancer, tuberculosis, asthma, and other non-communicable diseases (NCDs).

The population of Masindi District is predominately rural and widely dispersed. Health care infrastructure is well organised but sparse and many people have limited access to health care professionals. Therefore, our proposed project used CHWs as local champions of smoking cessation. Prior to this project we had already been working with the communities and CHWs in a burden of disease survey, as part of the FRESH AIR Uganda initiative, which identified the magnitude of the community's exposure to smoke and the prevalence of COPD. The CHWs were trained in lung health and interventions to facilitate stopping tobacco use based on peer counselling and support. They were also involved in developing educational materials to support their interventions that are adapted to specific cultural and tribal practices, which are often extremely localised. Educational resources were developed to reflect the way that gender, age and socio-economic status influences exposure to risk factors. In addition, we tested how best to support CHWs with mobile phone technology throughout the project.

The proposed project used proven interventions to facilitate stopping tobacco use for which there is clear evidence of effectiveness. Because the evidence base of effectiveness for interventions on smoking cessation is weak for LMICs, we adapted behaviour change interventions for which the evidence of effectiveness is very robust in other contexts.¹ In adapting interventions we addressed specific factors relating to the capacity of the public health care system in Masindi District and the lack access to pharmacotherapy and behavioural support for smoking cessation.

The IPCRG has a track record of working in Masindi District. We have already established excellent working relationships with key senior health staff and we have set up financial and management systems that been shown to be effective. In addition, the IPCRG has an extensive international network that it will use, together with the Global Bridges network, to extend the learning to colleagues in other rural low income areas such as Pakistan and Bangladesh, parts of India, Eritrea and Kyrgyzstan. This proposal, therefore, meets the overall requirements of the RFP as it is a collaboration across multiple countries and across regions. Our proposed project also aligns with the RFP's focus on LMICs because it takes place in Uganda, which according to World Bank figures ranks as the world's 16th poorest country.

Background

In LMICs COPD and other respiratory diseases are an increasing but neglected health problem. At present COPD is the third leading cause of death worldwide, surpassing HIV/AIDS in Africa.²

In addition, while tuberculosis is often not considered in relation to the tobacco epidemic in high income countries, it is an important factor in LMICs. The World Health Organization (WHO) concluded 'recent research has demonstrated that tobacco smoking is one of the most important risk factors that favours the progression from latent TB infection to pulmonary disease, increases the probabilities of relapse after TB treatment, and increases TB case fatality. Any reduction in the prevalence of tobacco smoking should be expected to bring about collateral benefits in the control of the TB problem'.³ Uganda is one of the 22 high TB burden countries that account for about 80% of the world's TB cases. It was also among the 6 countries that reported lower than a 85% treatment success rate.⁴

The IPCRG has been studying the specific risk factors contributing to respiratory diseases in LMICs and exploring how to develop context-adapted treatment and prevention through its FRESH AIR programme that currently covers Uganda, Vietnam, Kyrgyzstan, and Greece.⁵ Our

¹ Munabi-Babigumira S, Fretheim A, Øverland S. (2012) Interventions for tobacco control in low- and middle-income countries: Evidence from Randomised and Quasi-randomised Studies.

² World Health Organization. (2008) World Health Statistics

³ WHO / The Union (2007) A monograph on TB and tobacco control: joining efforts to control two related global epidemics

⁴ WHO, (2013) Global Tuberculosis Report

⁵ See <http://www.theipcr.org/display/RES/FRESH+AIR> for more information about the FRESH AIR programme.

FRESH AIR work in Masindi, Uganda, is a WHO-Global Alliance against chronic Respiratory Disease (GARD) demonstration project. As part of this, the IPCRG undertook an in-depth qualitative study of the impact of chronic respiratory symptoms in the Masindi district of Uganda.⁶ This FRESH AIR study used focus group discussions with 10–15 members of the community in 10 randomly selected villages.

Masindi District, which is located in the mid-western part of Uganda, has a predominantly rural population, with only 5.4% of the residents living in urban areas. The district population in 2010 was estimated at approximately 370,000. Masindi District has a diverse ethnic composition of 55 tribes, with the dominant tribes – the Banyoro and the Lugbara – forming about 60% of the population.⁷ Large parts of Masindi district are tobacco-growing areas and it is considered an economically important activity.

The IPCRG 's recent FRESH AIR study in Uganda concluded that smoking prevalence in men is 34%.⁸ In tobacco-growing areas most men and many of the elderly women smoke tobacco. It is their culture and they have easy access to tobacco products. Cannabis is smoked predominantly by young men. Young children smoke too, picking up the pieces thrown away by their fathers. Most of the adults smoke tobacco leaves wrapped in paper (simonko), some mix tobacco with ashes and place it under their tongues, and others – especially men who can afford it – smoke cigarettes. The study found that men smoke anywhere they want, including indoors in the presence of children, exposing their families to tobacco smoke every night.⁹ There is a perception that they cannot be challenged as they are the head of the family and can do whatever they want.

In addition to smoking tobacco, the drying of tobacco leaves can contribute to respiratory symptoms. Our FRESH AIR study identified that tobacco leaves were dried in sealed houses using an open fire. Both adults and children kept watch inside to ensure the leaves did not catch fire. Some adults had been exposed to that smoke for more than 30 years.

In addition, this study found that 93% of the population was exposed to indoor biomass smoke. Generally speaking, wood is the major source of biomass fuel for cooking and heating in Masindi. The poorest people in the rural areas are most exposed to biomass fuel smoke as they cannot afford clean and efficient cooking practices. Societal roles are largely determined by gender, with the result that women are much more exposed to biomass smoke than men, starting at a young

⁶ van Gemert F, Chavannes N, Nabadda N, Luzige S, Kirenga B, Eggermont C, de Jong C, van der Molen T. (2013) Impact of chronic respiratory symptoms in a rural area of sub-Saharan Africa: an in-depth qualitative study in the Masindi district of Uganda. *Prim Care Respir J* 2013;22(3):300-305. DOI: <http://dx.doi.org/10.4104/pcrj.2013.00064>

⁷ Male-Mukasa JB. (2010) Uganda National Household Survey, Uganda Bureau of Statistics

⁸ van Gemert, F., Kirenga, B., Chavannes, N., Kanya, M., Luzige, S., Musinguzi, P., ... & de Jong, C. (2015). Prevalence of chronic obstructive pulmonary disease and associated risk factors in Uganda (FRESH AIR Uganda): a prospective cross-sectional observational study. *The Lancet Global Health*, 3(1), e44-e51.

⁹ Van Gemert, F., Chavannes, N., Nabadda, N., Luzige, S., Kirenga, B., Eggermont, C., ... & van der Molen, T. (2013). Impact of chronic respiratory symptoms in a rural area of sub-Saharan Africa: an in-depth qualitative study in the Masindi district of Uganda. *Primary Care Respiratory Journal*, 22, 300-305.

age. Furthermore, our study identified that each tribal group has distinctive practices when it comes to staple food, cooking tradition, sleeping areas, and smoking habits, all of which significantly affect levels of exposure to biomass fuel smoke and tobacco smoke.

The study found that respiratory symptoms were common among men, women, and children. In several communities respiratory symptoms were stigmatised as they were often associated with tuberculosis. Few people were aware of the relation between smoke and respiratory health. The baseline of knowledge is described in a video we made with a Ugandan TV company to document our work:

<http://www.theipcr.org/display/HOME/2013/09/01/Fresh+Air+Uganda+Video>.

Masindi is a rural area of a low-income country with poor health infrastructure and tobacco growing is an important source of income. Healthcare infrastructure and access to healthcare



professionals is limited in Masindi District. At the village level CHWs, known locally as the village health team, offer health education on maternal and child health issues, malaria, pneumonia and diarrhoea. CHWs have no clinical training and receive incentives, rather than a salary. Primary health care services are available in 27 health centres which are generally staffed by a doctor, clinical officers and nurses. There is one hospital, based in Masindi town which acts as a referral hospital

for the whole district. Even many senior clinical staff have limited knowledge of chronic lung disease. COPD is not included in Ugandan Clinical Guidelines 2013.

In addition, within the Ugandan health system there is no access to pharmacotherapy for tobacco dependence and the availability of staff with the capacity to undertake motivational interviewing and to offer behavioural support is limited. The only smoking cessation service currently operating in Uganda is a small scale counselling service at the national mental health hospital in the capital city Kampala which is part of a bigger programme on alcohol and substance abuse. There has not been any effort to extend this to community health workers yet.

Approach

Intervention Design and Methods:

We used a whole systems approach involving all levels of stakeholders including the people in the communities. The project was designed to address the specific needs identified in the research outlined above. In doing so we have developed a highly innovative approach which is adapted to the local context and was based on evidence of what works in smoking cessation.

Stakeholder engagement

Working with stakeholder including patients and health workers we developed initial slideset for the educational programme in January 2014. In a series of 14 interviews, our preliminary slides



were shown to 51 stakeholders ranging from the President of Masindi District, the Minister of Health, the DHO, senior clinicians in the National Referral Hospital to all levels of community health workers including village health care teams and patients and people in the villages. Each time the slideset was shown the the feedback led to changes.

Stakeholders emphasised the need to teach health care workers at all levels about lung health, the important risk associated with

tobacco smoking and smoke exposure and to train them in how to support smoking cessation. This requires the development of training materials in a variety of formats. Training needs to include all levels of healthcare professionals because the existing knowledge base is low. Senior clinical staff need to be included as the healthcare system is organised hierarchically so their support for changing practices is key. Because CHWs are an important source of health messages in rural areas with poor access to health care facilities, they also need awareness raising and training.

In addition to providing training, an on-going system to provide continued support for CHWs and health care workers is needed. Evidence shows that mhealth, and in particular texting, offers a cost effective and feasible way of doing supporting CHWs.¹⁰ Therefore it was suggested that all health care workers and CHWs should be supported with information through mHealth. Stakeholders also suggested that lung health and smoking cessation should be included in the regional continuing medical development programme.

The qualitative research we undertook in Masindi district in January 2014 also highlighted the need for materials that CHWs and other health care staff can use to educate and raise awareness of lung health and support smoking cessation in their local communities. Local radio was suggested as a cost-effective way to convey messages and keep them alive in people's minds.

The project design

The project design recognized that it is important to build knowledge and capacity on lung health at all levels of the health care system in Masindi district. It implements the IPCRG's educational strategy that recognizes the need to equip those who will be training their colleagues with requisite training skills. The project taught health care workers and CHWs about lung health and the risks of smoking, and provide training in how to support behaviour change training. We used a cascading approach whereby the project team trained selected groups of staff from all levels about lung health and how to provide support for smoking cessation. These trained staff repeated

¹⁰DeRenzi, B. Et al. (2012) De Improving Community Health Worker Performance Through Automated SMS

this with their colleagues at the different levels of the Masindi health care system and throughout the district until 50 health care workers and 46 CHWs have been trained.

The project team developed, test and validated the training materials and adapted them based on feedback. This cascaded approach enabled continuation after the completion of this project, thus contributing to the development of a sustainable system for developing and maintaining capacity on smoking cessation and lung health within Masindi District.

CHWs were used as local champions of smoking cessation. CHWs are community based workers that help individuals and groups in their own communities to access health and social services, and educate community members about various health issues. Evidence has shown that CHWs play a crucial role in delivering primary health care in such settings. Their role is usually focused around child health but a recent WHO study recommended they should be trained in the prevention and treatment of communicable and non-communicable diseases.¹¹ Given that CHWs have limited knowledge about health and often have a low level of formal education, the project designed a one-day training tailored to their needs and their role in the health care system. Recent research has emphasized that on-going support for CHWs is essential if they are to work effectively.¹² Mobile telephone technology was used to support and maintain contact with CHWs throughout the lifetime of the project. IPCRG already has experience of training and working with CHWs in this region as part the FRESH AIR study. We have already verified that they have and use mobile phones for texting.

Our project adopted a whole systems approach to lung health which recognizes that in poor communities with high exposure to indoor biomass fuel, tobacco growing and drying in their homes, and smoking a range of substances, the harm caused by tobacco smoke cannot be managed in isolation. Therefore, the essential precursor to effective smoking cessation interventions is to raise awareness of lung health, the risks of smoke (both tobacco and biomass fuel). Training of health care workers and CHWs and educational materials developed for them to use with members of the local community reflected this.

We incorporated messages to address economic concerns related to tobacco growers. We also explored and addressed local health beliefs, traditions, and cooking culture. IPCRG's experience of working in this region has shown us that messages need to be graphic and optimistic, given low life expectancy, low levels of self-efficacy amongst the individuals with chronic disease and a perceived dependence on medicines rather than non-pharmacological approaches to improve health. The messages emphasized how changes now can improve their children's health, which is a common concern of the community. Messages and materials were piloted with small groups before being rolled out to test their effectiveness.

¹¹ Zulfiqar A. et al. Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: a Systematic Review, Country Case studies, and Recommendations for Scaling Up

¹² Maternal and Child Health Integrated Program (MCHIP). (2013) Developing and Strengthening Community Health Worker Programs at Scale: A Reference Guide for Program Managers and Policy Makers

The evidence base for both the effectiveness and cost-effectiveness of clinical smoking cessation interventions is strong in high income countries. The evidence base for low-income countries is much weaker. There is a need for more rigorous studies conducted in LMICs, with a particular focus on delivery strategies of therapies that have been successful in high income settings.¹³ This project included a process and outcomes evaluation aimed at identifying lessons to contribute to the evidence base.

This project used interventions to stop tobacco use for which there is clear evidence of effectiveness. Because the evidence base is weak for LMICs, adapted interventions that for which the evidence of effectiveness is very robust in other contexts.¹⁴ These included the Very Brief Advice (VBA) online module from the UK National Centre for Smoking Cessation Training.¹⁵ The VBA was developed for use in primary care. It involves a 30-second smoking cessation intervention using behaviour change techniques that are supported by meta-analysis including integrative theories of motivation such as PRIME theory.¹⁶ The VBA uses the 3 As approach: Ask; Advise; Act. This is applicable to countries without a supply of pharmacotherapies as the 'Act' can be behavioural support and self-help materials. Because the VBA intervention is brief and simple, it is adaptable for use by healthcare workers with limited training, including CHWs. We made use of CHWs capacity to provide peer counselling and support which is one of the roles which evidence suggests they are best-placed to fulfil.¹⁷

Evaluation Design:

We integrated a robust evaluation to ensure we capture and share the learning generated through our activities. This is particularly important because the evidence base around effectiveness and cost-effectiveness of stopping tobacco use interventions in LMICs is currently sparse. Because there is no standardised way of evaluating tobacco cessation training programmes for health care staff, our project used an evaluation methodology based on of Kirkpatrick's hierarchy model which looks at four levels of outcomes.¹⁸ This methodology has been used to evaluate the effectiveness of medical education interventions.¹⁹ The levels and outcome measures used for each of them are as follows:

¹³ Munabi-Babigumira S, Fretheim A, Øverland S. (2012) Interventions for tobacco control in low- and middle-income countries: Evidence from Randomised and Quasi-randomised Studies. Report from the Norwegian Knowledge Centre for the Health Services 03– 2012. Oslo.

¹⁴ Munabi-Babigumira S, Fretheim A, Øverland S (2012) . Interventions for tobacco control in low- and middle-income countries: Evidence from Randomised and Quasi-randomised Studies. Report from the Norwegian Knowledge Centre for the Health Services 03– 2012. Oslo.

¹⁵ See <http://www.ncsct-training.co.uk/player/play/VBA>

¹⁶ See www.primetheory.com

¹⁷ Maternal and Child Health Integrated Program (MCHIP). (2013) Developing and Strengthening Community Health Worker Programs at Scale: A Reference Guide for Program Managers and Policy Makers.

¹⁸ Kirkpatrick, D. L. (1979). Techniques for evaluating training programs. In D. P. Ely & Plomp T. (Eds.), *Classic Writings on Instructional Technology* (Vol. 1, pp. 231 – 241). Englewood: Libraries Unlimited, Inc.

¹⁹ Hutchinson, L. (1999) Evaluating and researching the effectiveness of educational interventions

1. *Reaction - what participants thought and felt about the training*
 - The impact of mobile telephone text support on the CHWs (tested with interviews with a sample of those CHWs trained).
2. *Learning - the resulting increase in knowledge and/or skills, and change in attitudes*
 - The effectiveness of the one day training conducted by the trainers in increasing the knowledge of those staff trained on facilitating stopping tobacco use and lung health (tested post-training questionnaires with those trained and follow-up interviews with a sample of those trained);
 - The knowledge about and capacity of CHWs to facilitate stopping tobacco use and lung health (tested post-training questionnaires with those trained and follow-up interviews with a sample of those CHWs trained).
3. *Behaviour - transfer of knowledge, skills, and/or attitudes from classroom to the job*
 - The effectiveness of the training the trainers module in increasing the capacity of those trained to train their colleagues (tested by interviews with them, observing the training they carry out and post-training questionnaires with staff they train);
4. *Results - the final results that occurred because of attendance and participation.*
 - The appropriateness of educational messages and the extent of message penetration in surveys of population, including recent ex-smokers and current smokers;
 - For those who stopped tobacco use, what were the motivators to quit and did our messages encourage them to quit. For current smokers, do they intend to stop using tobacco, what are the obstacles, have they had heard our messages and do they encourage them to quit;
 - The impact of one to one interactions with trained CHWs on people's tobacco use and other lung health risk factors (tested with follow-up interviews with a sample of those people who receive one to one interventions from CHWs);
 - The impact of group interactions with trained CHWs on people's tobacco use and other lung health risk factors (tested with follow-up interviews with a sample of those people who attend groups sessions led by CHWs).

We constituted a project Expert Advisory Group, which made of senior researchers and clinicians. The evaluation was conducted by our project team, with Dr Rupert Jones, an experienced clinical and researcher, as lead evaluator.

The project learnings were shared as they were realized and dissemination efforts continue as results are analyzed. To aid monitoring and evaluation of the project, we identified work streams under which to track the project impact. The work streams were:

- *Workstream 1: Developing the training the trainers module in facilitating stopping tobacco use and promoting lung health*
- *Workstream 2: Rolling out the training to health care workers and CHWs*
- *Workstream 3: Developing the education tools for CHWs*
- *Workstream 4: Use of mobile telephone technology and radio messages*
- *Workstream 5: Evaluation of the project and dissemination of the learning*
- *Workstream 6: On-going project management, expert technical support and reporting*

Achievements (results)

Quantitatively this project has had the following impact: The project trained 157 health care workers in lung health and smoking cessation exceeding the planned target of 106. While we targeted to reach 11,000 general population with smoking cessation and lung health awareness messages, we reached over 15,000 in direct contact education sessions.

Achievements by work stream are presented below:

Workstream 1: Developing the training-the-trainers module in facilitating stopping tobacco use and promoting lung health

Our goal in this workstream was to develop a cascading and sustainable training-the-trainers' module to facilitate the stopping of tobacco use and promote lung health.

Due to the inexistence of any training module on lung health used in Africa to act as a reference, the project's Technical Advisory Group (TAG), a few health care workers in Masindi and some members of the project's Expert Advisory Group (EAG) performed an extensive literature search to determine the content of a lung health training module suitable for primary care providers and CHWs in Africa. Each member developed objectives and content of a particular session. When the draft materials were ready two European project TAG members, FvG and RJ travelled to Uganda on 28th February 2015. The team then held a meeting with all persons involved in material development to review each other's material in a peer review process and the final presentation material was reached by consensus.

Thereafter the material was presented to the initial trainers. At the end of each, we asked for feedback from the trainees on whether they consider the material appropriate for their fellow health care providers. We adapted the material until consensus was reached amongst the project team and the trainees. The trained trainers used the above materials to train other health workers. Again we encouraged feedback. Final of training schedules and materials are attached.

Workstream 2: Rolling out the training to health care workers and CHWs

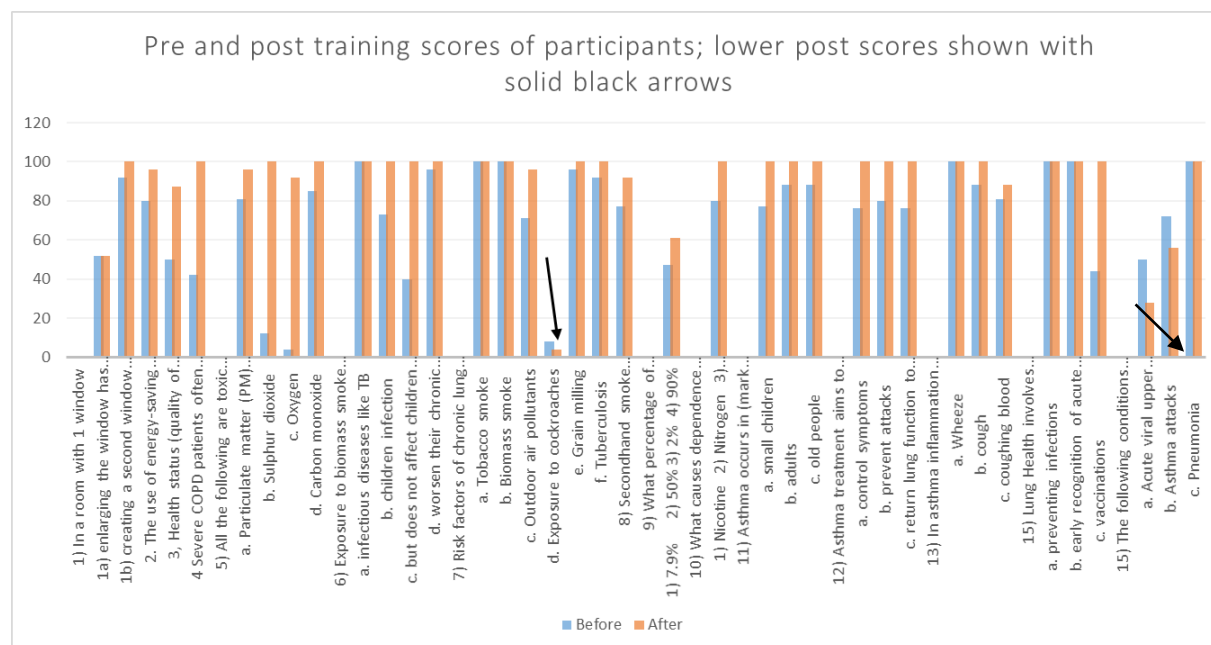


The primary aim of this workstream was to increase health care providers' knowledge at all levels in Masindi district about smoking cessation and lung health through trainings. Our plan was to deliver the trainings using a cascading model in three rounds with round 1 comprising of 10 health workers, round 2 comprising of 50 health care workers and round 3 comprising of 46 Community Health Workers (CHWs). However, from the interactions with district leaders and health care workers, the project team decided to increase the number of

CHWs to be trained from 46 to 109. This was such that each trained HCW has a set of CHWs to work with in teaching their catchment communities about smoking cessation and lung health.

The initial 12 trainers trained were selected by the district health office. This training was conducted from 3rd March 2015 to 5th March 2015 at the district health office resource center. Pre and post-tests were given. Successful trainees were awarded certificates of completion. There were modifications to this training. First, we trained 12 trainers instead of the planned 10 on the advice of the district health office. Secondly, we shortened the didactic training to 3 days reserving the last two days for the trainees to work in groups to adjust the materials.

Following the completion of training-the-trainers, training of additional health care workers was undertaken. This group was trained by the trainers selected from those that trained in the first group with support from the project team. However, senior trainers were in attendance in all sessions. Trainees were selected as follows: one participant from health center two (HC II), two participants from health center three (HC III) and three participants from health center four (HC IV). Out of the 50 invited health care workers, 47 attended the training at the district resource center. For proper management of trainees, the trainees were divided into two groups. The first group of 22 was trained from 22nd to 24th April 2015 and the second group of 25 was trained 27th to 29th April 2015.



After attaining provisional approval of the materials developed in workstream3, training of CHWs was conducted from 22nd to 25th September 2015 in nine different groups using the draft materials. The CHWs' trainings were one-day trainings conducted at sub-county levels of Masindi district. Of the 109 targeted, a total of 100 CHWs were trained. The trained CHWs were selected from villages nearest to their respective supervising health facilities. A total of 27 trainers who conducted the training were selected among the health care workers previously trained in round 2. This training was supervised by both the National trainers/supervisors, district trainers (trained in round 1) and the project staff. At the end of the trainings, trainees were tasked to demonstrate

how they would teach in their local communities using the presented materials and also point out any issues in the content that seemed unclear. About 90% of the CHWs found the IPCRG flow chart for smoking cessation for primary care to be complicated; this flow chart was replaced by the Very Brief Advice (VBA) guideline from National Centre for Smoking Cessation and Training, UK.

Workstream 3: Developing the education tools for CHWs

The objective of this task was to develop educational materials that can be used in local communities to support interventions for people to stop using tobacco and reduce other risks to lung health.



Like for training materials, the project team developed draft materials through literature reviews. The draft materials were peer reviewed among all the project members and then presented to the HCWs during the trainings for their input. A 2-day workshop comprising the project team and six health promotion and education experts from the

ministry of health reviewed the materials and made changes. These materials were then sent to an illustrator familiar with health illustration. He produced drafts that were reviewed and sent to the community for pretesting. These materials were pretested in three different major cultural (Alur, Lunyoro and Lugbara) communities of Masindi.

Changes were effected after pretesting and the adjusted materials presented to a 2 member select committee of health promotion experts who were satisfied and forwarded them to the Health promotion and education commissioner for approval. Prior to final approval, the commissioner recommended input from the tuberculosis control program (NTLP) and the non-communicable diseases control program (NCD) before final approval for mass production. This was done, and both the NTLP and NCD program managers endorsed all the materials with exception of “Effects of Smoke on Lungs and Body” poster advising that we should use the “Smokers’ Body” poster which is scarier. All their recommendations were incorporated, and the revised materials plus their recommendations were taken back to the commissioner who finally approved the materials on 17th September 2015. These materials were produced and distributed to all trained CHWs and all health facilities in Masindi district. The materials include posters and a flip book. (Attached).

Workstream 4: Use of mobile telephone technology and radio messages

The major goal of this task was to explore how best to use mobile telephone technology and other media including radio to support the trainers, the CHWs and people receiving education through the project.

In March 2016, the project team led by project's community liaison officer embarked on development of Short Message Service (SMS) Messages for the trained health care workers and CHWs reporting on lung health. Initially, the team opted for a toll-free line so that the reporting health care workers and CHWs are not charged while sending the messages. However, the long bureaucratic processes, and terms and conditions involved in acquiring this toll-free line were beyond the allocated activity budget line. After several local project team meeting discussions, the team decided that the project manager should send the messages directly from her phone to the trained health care workers. The messages started on 13th June 2016 and continued till November 2016. The project team received positive SMS responses from some of these health workers.

To reinforce awareness, draft radio messages (Radio talk show guide script and radio spot) were also developed from the paper materials by the project team, reviewed by experts from division of health promotion and education of the Ministry of health who recommended changes that were incorporated. After finalizing the materials, the team contacted two radio stations in the target area (Masindi) and selected one (radio Kitara) with the widest coverage in that area. The radio station together with the project team produced the radio spot message in English and translated it into two prominent local languages (Lunyoro and Swahili) to cater for the illiterate communities. These radio spots were run for two consecutive months and redun for one month after completion of all the project activities on radio Kitara. On 22nd March 2016, the project community liaison officer presented the first project radio talk show between 8:00pm to 9:00pm on the same radio. Subsequent radio talk show sessions were presented on 29th March 2016, 4th April 2016 and 11th April 2016 at the same time. The paper radio messages (radio spots and talk show guide script), Produced radio spots and recorded radio talk shows are attached.

The project team also developed strategies for interfacing with the trained health care workers like the health care workers' reporting tool for the trained health care workers to ensure that they incorporate smoking cessation counseling into their routine activities.

Workstream 5: Evaluation of the project and dissemination of the learning

The objective of this task was to carry out robust evaluation exploring processes and outcomes so as to capture and share learning from this innovative project and contribute to evidence base on effectiveness and cost-effectiveness of interventions to facilitate stopping tobacco use interventions in low and middle-income countries (LMICs).

Because there is no standardized way of evaluating tobacco cessation training programmes for health care staff, project evaluation was based on of Kirkpatrick's hierarchy for evaluating professional teacher development and subsequently medical education to evaluate the project's outcomes as described below:

Participant reaction: the feedback on the materials was integrated into final versions

Participant learning: the project team developed pre and post-training knowledge assessment questionnaires for both the health care workers and CHWs, and also observed all their training sessions. At the end of the first year of the project in November 2015, in collaboration with our

Northern counterparts (RJ and FvG), the team started with process evaluation majorly focusing on trainings conducted, by scrutinizing/analyzing the pre- and post-knowledge assessments given during the trainings.

Organisational support and change: During this exercise, a year 2 activity plan was drawn (attached) and this evaluation indicated the need for a fresher training which was conducted 17th November 2015 and a total of 10 district trainers underwent the training. The team also captured some CHWs' teaching sessions in the community to assess the utility of the flip-chart.

Participant use of new knowledge and skills: This project evaluation also recommended regular support supervision of trainees. In January 2016, the project team conducted a round visit to all health facilities in Masindi to make a follow up on trained health workers and ascertain how and whether lung health awareness campaign is promoted and integrated into their daily activities and to assess the COPD screening of suspected patients attending these facilities. It was observed that patient screening for COPD using COPD 6 equipment was at bare minimum. There were records to show patients screened just after the distribution of the equipment. Most of the Health workers reported a problem of lack of batteries in their machines (COPD 6), challenges of referral of suspected COPD patients for spirometry to confirm or rule out COPD

Dissemination of project activities and outputs was conducted to the district officials on 28th November 2015 by Dr Patrick Musinguzi, a member of the FRESH AIR Uganda group. The chairman of the district and the whole council were appreciative of the project's work and requested to always keep the council in the know of such activities so that the community is continuously sensitized on the project's objectives.

Impact on participants, practice and service users: To be able to establish the impact of the mass media campaign, the lead evaluator together with other project members designed a simple tool



(Attached) to measure mass population knowledge on smoking and other lung health issues. Prior to starting sensitization in communities and after the training of CHWs, the CHWs were tasked to submit a listing of all households in their villages which the project team used to randomly sample ten (10) households in each village. The team working with these CHWs conducted a baseline survey and collected 1270 questionnaires which have been entered into a database designed by the project team. The

same tool will be administered at the end of the awareness campaign to assess penetration of information delivered. To further establish the project's impact on ground, the project team led by RJ and FvG on 17th April 2016 visited two villages (Nsambya and Rubani) in Masindi district and interviewed two CHWs (Free Bernard and Ssentamu Gertrude) of those respective villages and their responses were very positive and promising.

In addition to other dissemination activities, the team submitted the following outputs:

- an oral presentation to the Pan African Thoracic Society (PATS) conference that was held in Nairobi Kenya in April 2016 about the findings of the project (abstract attached)
- an oral presentation was made at the IPCRG conference in Amsterdam in May 2016
- a poster to Global Bridges which was presented at European Respiratory society conference.
- An oral presentation at the International Union against TB and Lung disease conference in October 2016.

The project also stimulated us to conduct a baseline survey of the availability of tobacco dependency pharmacotherapy in Uganda. A manuscript was accepted for publication in the Public Health Action journal (attached manuscript)

Workstream 6: On-going project management, expert technical support and reporting

During the conduct of this project weekly project meetings were held where the project manager provided weekly reports. Two interim reports were made and submitted to the funder. The in country technical advisory group were part of the project planning and implementation. Some members participated in the training. Currently, the team is designing an exit strategy as well as writing a project report to be published in a global academic journal.

Challenges

The major challenge during the implementation of this project was the lengthy and bureaucratic process of approving the education materials which delayed the training of CHWs by several weeks. We, however, appreciate that those processes improved the quality of these materials produced by the project.

The other challenge to the project is how to have trainees implement what we taught them in their clinics. We devised refresher trainings, support supervision and designed reporting tools as solutions. There is also demand for more detailed smoking cessation services from the community and the team continues to lobby and write grants that will help expand cessation services.

Positive feedback relative to this project

It is evident from the conversations we have heard with the district leaders that there is great interest in this project. Specifically, the former Masindi district chairman (Isingoma Wilson) thanked Fresh Air Uganda for coming into existence articulating that lung health awareness is so significant since People in Africa and Uganda for so many years cook on firewood in their houses as the cheapest source of energy without knowing that they are killing themselves slowly. He also added that after the Fresh Air pilot survey, he has seen some few people in Masindi construct well ventilated kitchens.

Furthermore, the district local government incorporated COPD and its risk factors in their five years District Development Plan (DDP FY2015/16-2020/21) as one of the diseases to be targeted

by government interventions. To increasingly sensitize communities about the effects of smoking and exposure to biomass smoke, the district established a partnership with an organization called “Kitara Heritage Development Agency (KHEDA)” to construct 1000 biogas stoves in homes as an alternative clean source of energy. On 27th May 2015, the district also announced a renewable energy plan funded by the World-Wide Fund (WWF).

List of publications and other outputs (see table below)

Date	Conference name and country	Title	Type	First author	Description
Apr 2015	Primary Care Seminar, Plymouth University United Kingdom	Chronic respiratory disease in Africa: a neglected problem	Teaching seminar	RJ	University seminar
May 2015	IPCRG 4th Scientific Meeting, Singapore	An exploratory trial to test the impact of training midwives to deliver biomass smoke reduction on exposures, pregnancy outcome and infant health	Oral presentation	RJ	academic presentation for clinical academics
Sept 2015	British Lung Foundation SW regional meeting	Research in COPD and lung health in UK and Africa	Invited lecture	RJ	regional meeting for the Lung Foundation patient group
Oct 2015	Global Health MSc, Plymouth University United Kingdom	Research and fundraising in Global Health: lung health in Africa		RJ	MSc teaching
Jan 2016	Junior Doctors' respiratory training, Derriford Hospital United Kingdom	COPD in Africa- preventing chronic lung disease	Teaching seminar	RJ	education seminar for junior doctors
Apr 2016	Pan African Thoracic Society, Kenya	The development and implementation of a Lung Health programme for rural Uganda addressing biomass and tobacco smoke	Oral presentation	RJ	academic abstract presentation for academic/ clinical audience in Africa

May 2016	Tobacco Dependence Treatment Summit, USA	Training Community Health Workers in Rural Uganda to Introduce Stop Smoking Interventions in a Context of a Lung Health Awareness Campaign	poster	BK	large Global Bridges meeting in USA, our project was highlighted of of the whole conference as showing the way to use grass roots health workers to deliver an innovative lung health programme
May 2016	IPCRG 8 th , World Conference, Amsterdam, Netherlands	Development and implementation of a lung health programme for rural Uganda addressing biomass and tobacco smoke	Invited lecture	FvG	Presentation for primary care international physicians/reserachers
Jun 2016	Derriford Hospital Research Day United Kingdom	Silent killer on the rise – addressing the causes and treatment of lung disease in Africa	Invited lecture	RJ	important presentation before the Vice Chancellor and CEO of Derriford Hospital, went down well.
Oct 2016	47th Union World Conference on Lung Health, Liverpool, United Kingdom	The development of a lung health awareness-raising programme in Masindi province, Uganda	Oral presentation	RJ	Presentation for global physicians and resreachers