Mobile Training and Support (MOTS) Service: Umurinzi Campaign Program
Post-Test Report

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1.0 Background on MOTS

Between 2014 and 2016, West Africa was struck by the largest outbreak of Ebola in the history of humanity. Over 11,000 cases of Ebola were registered across Guinea, Liberia and Sierra Leone, with about 4,000 deaths in Sierra Leone. Many international bodies sought ways to fight the epidemic. As part of the European Community's efforts to address the advancement of Ebola vaccine, the Innovative Medicines Initiative (IMI) responded with a call for innovative projects. The EBOLA vaccine Deployment, Acceptance & Compliance (EBODAC) project, a public-private partnership, was funded out of IMI.

The EBODAC consortium is composed of London School of Hygiene and Tropical Medicine, Janssen Pharmaceutical N.V., World Vision and Grameen Foundation. EBODAC's goal was to develop strategies and tools to promote the acceptance and uptake of new candidate Ebola vaccines being tested in the EBOVAC-Salone Ebola vaccination trial. EBODAC had a remit to build local knowledge and capacity in preparation for the potential future use of licensed Ebola vaccines. As part of this latter mandate, EBODAC developed a Mobile Training and Support (MOTS) service that was piloted with Community Health Workers (CHWs) in Bo district, Southern Sierra Leone in 2018 and later resulted in the full implementation in Kambia District in 2019.[1] MOTS is based on Interactive Voice Response (IVR) technology and is designed to deliver audio-based refresher trainings on the topics of vaccines and outbreak response including Ebola disease surveillance procedures.[2]

As of February 11, 2020 the World Health Organization (WHO) had documented 3,432 Ebola cases in the Democratic Republic of the Congo (DRC) and 2,253 deaths, resulting in a case fatality ratio of 66 percent. The outbreak in the DRC makes it the second deadliest outbreak (with the 2014-2016 West Africa epidemic being the first) and continues to raise concerns about the potential of the virus to cross international borders. To address this concern, the EBOLA vaccine Deployment, Acceptance & Compliance (EBODAC) consortium, which was designed to respond to the West Africa outbreak in Sierra Leone, received permission in 2019 to expand its activities into the border region of the DRC. In Rwanda, MOTS is being used for training of CHWs on issues concerning their Ebola vaccination campaign.

1.1 About Mobile Training and Support (MOTS) Service

Mobile Health (mHealth) is defined as wireless telemedicine in which mobile phones, telecommunications and multimedia technology are developed and integrated with mobile healthcare delivery systems.[3] In low resource countries like Sierra Leone, the use of mobile technology was rapidly introduced to motivate and equip healthcare providers. EBODAC's contribution is through a platform for conducting trainings to address the healthcare challenges such as access to affordability, matching of resource and refresher trainings to remind and improve the quality of learning for CHWs.[4]

EBODAC introduced the MOTS service to develop new ideas in innovative technological tools to strengthen the health network at the lowest level. It was further implemented, evaluated and lessons learned documented for future use and application. CHW supervisors can monitor module and quiz completion, quiz results, and listening patterns to assess the

[1] Smout B, Schulz W, Larson H, Willems A, McKenna P. 2018. Community Engagement, Communications, and Technology for Clinical Trials in Outbreak Settings. EBODAC Training Resource. EBODAC. http://www.ebovac.org/ebodac/training-resource/

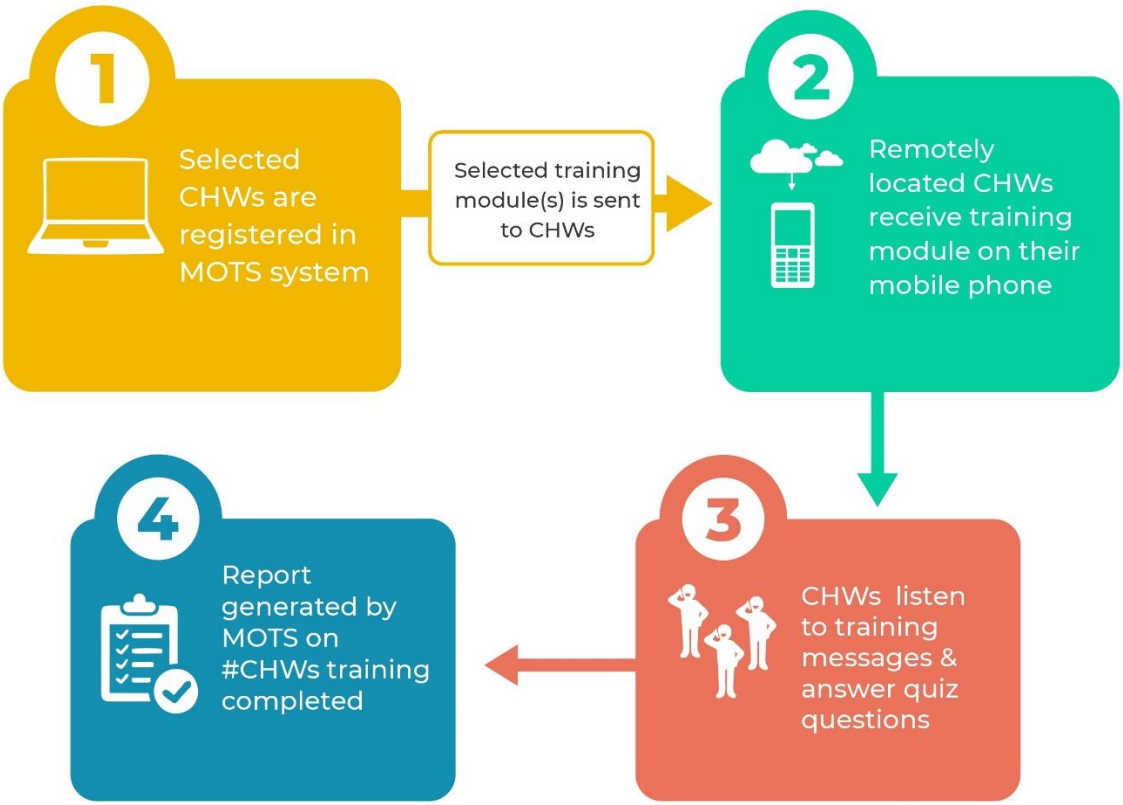
[2] Kamara F, Gray B, Babughirana G. 2020. Final Evaluation Report: MOTS Service for Community Health Workers in Bo and Kambia, Sierra Leone. https://grameenfoundation.org/partners/resources/final-evaluation-report-to-test-and-deploy-the-mobile-training-and-support-mots-service-for-community-health-workers-in-bo-and-kambia-sierra-leone?keywords=&categories=

[3] Qiang CZ, Yamamichi M, Hausman V and Altman D. 2011. Mobile application for health sector. WHO. http://siteresources.worldbank.org/INFORMATIONANDCOMMUNICATIONANDTECHNOLOGIE/Resourc

[4] CORDIS. 2014. Communication strategy and tools for optimizing the impact of Ebola vaccination deployment. EBODAC. https://cordis.europa.eu/project/rcn/209447_en.html

performance of the modules and the CHWs. Figure 1 below shows the architectural illustration of MOTS concept and work flow.

Figure 1: How MOTS works



1.1.3 CHW MOTS system Enrollment Criteria

CHWs ability to log into the MOTS service and access the units within modules is dependent on the following enrollment criteria

a) The CHW's telephone number should be registered in the MOTS system so that the system is able to push the training modules, and the initial introductory message.
b) The CHW flashes the dedicated MOTS phone number, using the registered telephone number. This further meant that the CHW needed to have top-up to effect the flash.
c) The CHW should be able to receive the call back from the dedicated phone number and listen to the IVR in their preferred language. In this particular training, it is Kinyarwanda.
d) At the end of each unit, the CHW should be able to press keys on the phone corresponding to the responses to the quiz.

2.0 Profile of Community Health Workers in Rwanda

In Rwanda, each village (100 to 200 households) elects three volunteers to act as CHWs for the general population. The three volunteers comprise of a man and a woman for general diseases and a woman as assistant for maternal care to follow antenatal care, women after delivery and children below 9 months. Once elected, the CHWs are trained by the Ministry of Health throughout the country to deliver quality of services, monitor health at village level and refer sick patients to the nearest health facility. The program began in 1995 with 12,000 CHWs who promoted healthy behaviors, conducted community mobilization, and provided basic services.

To ensure stronger management and more effective resource allocation, the MOH decentralized the health system. In 2004, the country designated the village as the lowest administrative level to encourage community ownership of development. This change shifted CHWs from the cell to the village level. The MOH also introduced an integrated community health services package, which transferred responsibility for selected maternal and child health services from health facility staff to CHWs. To meet community needs, the MOH increased the number of CHWs and scaled the program nationwide. Over the past decade, these efforts have contributed to health improvements, particularly in vaccination coverage rates and reduction in maternal and child mortality.[5]

From 2005, after the decentralisation policy was introduced countrywide, there was sustained capacity building of the CHWs through training and supply of materials. By 2011, the number of CHWs had grown to 60,000. In May 2012, the Ministry of Health and Ministry of Local Government decided to remove the CHWs in-charge of Social Affairs in all the villages. The number of CHWs was therefore reduced from 60,000 to approximately 45,000. The range of services offered at community level by CHWs has evolved over time and so has its underlying policy, plans and implementation strategies.[6] Rwanda is administratively divided into five provinces, which are in turn divided into 30 districts. This implies that each district on average consists of a total number of 1,500 CHWs.

Like in the majority of African countries, the frequency of group trainings and group refresher trainings depends on the needs but also on the availability of the funds. There is no guideline on when to conduct refresher trainings and no standardized modules of refresher trainings. When funds are not available, the CHW In-charge at the health centre and health centre staff try to provide on-the-job training to CHWs during supervision visits or allocate time for training during the monthly CHWs coordination meetings at health centre. Trainings are organised following a cascade model. The central level is responsible to train Master Trainers who will, in turn, conduct trainings of trainers (ToT) with relevant staff at district hospitals. Trainers at district hospitals will, in turn, train health providers at health centres to train and supervise CHWs.

3.1 MOTS Objective in the Umurinzi Campaign program

The primary objective of the implementation of MOTS in Rwanda is to strengthen the CHW network for preparedness of Ebola vaccine campaigns and epidemic response. By the end of the MOTS training, a CHW should know what Ebola is, signs and symptoms and prevention methods. In addition, a CHW should be able to know and recognize who is eligible for the EBOLA vaccine, sites of the vaccination and also the type of the vaccine given.

3.1 Umurinzi Program Intervention

EBODAC, through the Umurinzi Campaign, is working with the MOH to strengthen the existing health framework by rolling out a training of CHWs using MOTS. The MOTS trainings lasted six months, starting in December 2019 and completed in May 2020, and focused on the CHW awareness of Ebola and Ebola vaccination of which was intended for cros- border workers and people who reside in Western Province districts near the borders where the Ebola outbreak has occurred. The target population for the vaccine is for those aged two years old and above.

The Ebola curriculum consisted of five modules which were pre-recorded in the Kinyarwanda language. Each module has five units, each unit with a duration of approximately one minute (Table 1). A post –test quiz for each unit followed to assess the learning process. Given the absence of a pre-test, a target of 80% having correct knowledge on each question was established.

Table 1: Umurinzi Campaign IVR Modules and Unit Key Messages

Modules/Units	Key Content	Key Message
Module 1: General Information on Ebola		

[5] https://www.ippmedia.com/en/node/72641
[6] https://www.unicef.org/evaldatabase/index_94535.html

Unit 1	Introduction	Rwanda is a country that strives to promote the health of the population. That's why Rwanda has been taking health measures to prevent Ebola outbreak through community education, and other strategies. It is in that same perspective that the Ministry of Health is calling you today about the Umurinzi program of Ebola vaccination intended for cross border workers, and people who reside in Western Province districts near the borders of a country where the Ebola outbreak has occurred. The target population will be those aged two years old and above. Please listen to the entire call and answer the questions asked using the digits on your phone. Please listen to all options first and then after choose your answer.
Unit 2	What is Ebola?	Ebola is a very contagious disease caused by an infection with a virus. The virus is spread to humans when there is direct contact through body fluids of sick patients.
Unit 3	How is the Ebola virus transmitted?	Ebola virus can be transmitted by: • Direct contact with blood, bodily fluids, urine, saliva, feces, vomit, breast milk, sperms, tears, of patients with or who died of Ebola virus disease. • Objects (needles and other sharp objects) that have been contaminated with body fluids from a person sick with Ebola or the body of a person who died from Ebola. • Eating infecting animals such as fruit bats and primates.
Unit 4	If exposed to the Ebola virus, when will symptoms show up?	Ebola symptoms show up 2 to 21 days after being exposed to Ebola.
Unit 5	What are the symptoms if you have Ebola?	Ebola symptoms vary and appear in stages: • Sudden onset of fever, intense weakness, muscle pain, headache and sore throat are commonly experienced at the beginning of the disease ('the dry phase'). • As the disease progresses, people commonly develop vomiting and diarrhea ('the wet phase'), rash, impaired kidney and liver function, and in some cases, both internal and external bleeding.
Module 2: Vaccination Campaign Details		
Unit 1	Why is the program only in the Western Province?	Although Ebola is not in Rwanda, Rwanda chose to focus on the Western Province because it is the province near the region where the Ebola outbreak has occurred.
Unit 2	Can foreigners receive the vaccine?	A foreigner in Rwanda is allowed to receive the vaccine if s/he agrees that s/he will come back for the second vaccine shot.
Unit 3	What is the difference between the Merck vaccine and the Janssen vaccine?	The Merck vaccine is a single dose vaccine which was given to a small group of people due to a small quantity of vaccine. The Janssen Pharmaceutica vaccine is a two-dose vaccine which will be given broadly. Merck vaccine is for ring vaccination and select high risk / front line Health Care Persons) whereas Janssen vaccine is for broader preventive use on a mass scale.
Unit 4	Which Ebola vaccine is going to be given in the Umurinzi program?	The Janssen Ebola vaccine will be given for the Umurinzi program.
Unit 5	Who do you call to find out information on the Umurinzi campaign?	For any other information regarding the Umurinzi program, call the Ministry of Health toll-free number: 114
Module 3: Participation Requirements		
Unit 1:	Who is required/eligible to be vaccinated?	The Ebola vaccine will be given to populations at high risk of contracting Ebola. For example: People who travel in areas where Ebola outbreak has been confirmed/occurred. In Umurinzi Program, the vaccine will particularly be administered to cross border workers and to people who reside in districts located in the Western Province close to where the Ebola outbreak has occurred. This is for ages two years old and above.

Unit 2	Who is not eligible to be vaccinated?	Pregnant women, and children under two years of age will not be allowed to participate in Umurinzi program.
Unit 3	Is it compulsory to get the Ebola vaccine?	Participation in the vaccination program is voluntary. Any person enrolled in the vaccination program will be required to provide his/her full demographic information, and will commit to receive a second vaccine shot.
Unit 4	Is there any sanction to those who decide not to participate?	If you choose not to participate in Ebola vaccine program- there will be no consequences as participation is entirely free and voluntary.
Unit 5	What are the enrollment requirements for the Umurinzi program?	Any person enrolled in UMURINZI Ebola vaccine program will be required to provide his/her full demographic information and be willing to take a passport photo clearly showing his/her face and a scan of your iris. That will serve as a digital technology strategy to know the participants who will have taken the first vaccine shot.
Module 4: Where will vaccinations take place?		
Unit 1:	Where will vaccinations take place?	Initially the Ebola Vaccine will be administered at the health centers or vaccination sites in Rubavu and Rusizi.
Unit 2	Does it cost anything to get the vaccine?	In Rwanda, Ebola vaccine will be free of charge.
Unit 3	How will the vaccine be given?	Ebola vaccine consists of injection on the arm or the thigh given in two shots. Between the second shot, and the first one- there is two months interval.
Unit 4	Is it necessary to take the 2nd vaccine shot?	It is important that any person who commits to receiving the Ebola vaccine take both the first and the second Ebola vaccine shots to maximize vaccine efficacy.
Unit 5	What identification should you bring to participate in the Umurinzi program?	To participate in the Umurinzi program, bring your national ID if you have one and child's vaccination card.
Module 5: Vaccine Follow-up		
Unit 1:	Adverse effects	Similar to other vaccines, you may experience adverse effects such as: injection site pain, headache. However, not everyone experiences adverse effects. If you feel unwell, after vaccination- please call the contact on the Umurinzi vaccination card.
Unit 2	Who do you call if you feel sick after taking a vaccination?	Following vaccination, if a person feels sick/ unwell- it is recommended to go to the nearest health facility, or to call the contact on the Umurinzi vaccination card.
Unit 3	Communication from Umurinzi program	After the first vaccination shot, the vaccinated people will continue to receive reminder messages for second vaccination.
Unit 4	Can I get my 2nd dose at a site different from the first vaccine?	You may receive your second vaccination shot from the nearest vaccination site; however, you should present the Umurinzi vaccination card you or your child got at the time of the first vaccination shot, but if you don't have the card, you or your child can still come for the 2nd shot.
Unit 5	Conclusion	You are advised to continue the normal procedures of preventing Ebola even though you have been vaccinated. Thank you for listening to the information and for answering the questions. Wishing you a healthy life!

The CHWs were monitored by the In-charges through the MOTS mobile app and MOTS web interface to ascertain their level of completeness. Weekly progress reports were shared by the monitoring and evaluation team to support the In-charges with their supervision.

3.2 Study Area and Population

The Western Province, with concentration on the districts of Rubavu and Rusizi, which are approximately 185.6Km apart, was the targeted area due to its geographical proximity to the active outbreak areas in DRC. The target population for the implementation of MOTS service was recommended by the Ministry of Health and Sanitation based on its structure of

CHWs in the implementation locations. Populations included 1,672 CHWs and 35 In-charges. A total of 716 CHWs were from Rubavu District and 956 CHWs from Rusizi District. The table below breaks down of the number of CHWs from each sector and the respective sector.

Table 2: Number of Targeted CHWs per District

District	Sector	Facility	Number of CHWs
Rubavu	Bugeshi	Bugeshi HC	144
Rubavu	Busasamana	Busasamana HC	147
Rubavu	Byahi	MV	24
Rubavu	Cyanzarwe	MV	90
Rubavu	Cyanzarwe	Busigari HC	76
Rubavu	Gisenyi	Gacuba HC	33
Rubavu	Gisenyi	Gisenyi HC	58
Rubavu	Nyamyumba	Kigufi HC	144
Rusizi	Bugarama	Islamic HC	144
Rusizi	Gashonga	Mibilizi HC	141
Rusizi	Gashonga	Nyakarenzo HC	32
Rusizi	Gihundwe	MV	90
Rusizi	Kamembe	MV	104
Rusizi	Mururu	Nyakarenzo HC	12
Rusizi	Mururu	Rusizi HC	119
Rusizi	Nyakarenzo	Nyakarenzo HC	88
Rusizi	Nzahaha	Rwinzuki HC	130
Rusizi	Rwimbogo	Mushaka HC	96
Grand Total			**1672**

mv-Missing variable

3.3 MOTS Data Analysis and Management

The Viamo IVR system was used for the MOTS implementation in Rwanda and was integrated with the MOTS open source platform to register CHWs with unique phone numbers and other relevant information. The system collects information from every CHW logging into the platform by flashing the MOTS phone number. The system shows data on progress made by each CHW at the module level (not started, in progress, and completed). The data collected on the platform was being monitored by the project Technical Specialist and the project M&E Specialist. The weekly data report and the data uploaded on the MOTS platform server was exported into Excel for possible code cleaning, and contingency cleaning was done by the project M&E specialist. The quantitative data was cleaned and analyzed; percentages, tables and graphs generated using Excel. The data were processed with adequate precautions to ensure confidentiality and compliance with applicable data protection laws, and regulations as per the MOTS protocol. The personal data was protected against unauthorized access by requiring a username and a password for each login; and unlawful destruction or data loss mitigated by securely performing regular backup of data. Staff that required access to personal data agreed to keep the identity of CHWs confidential.

4.0 Results of the MOTS Umurinzi Vaccination Campaign

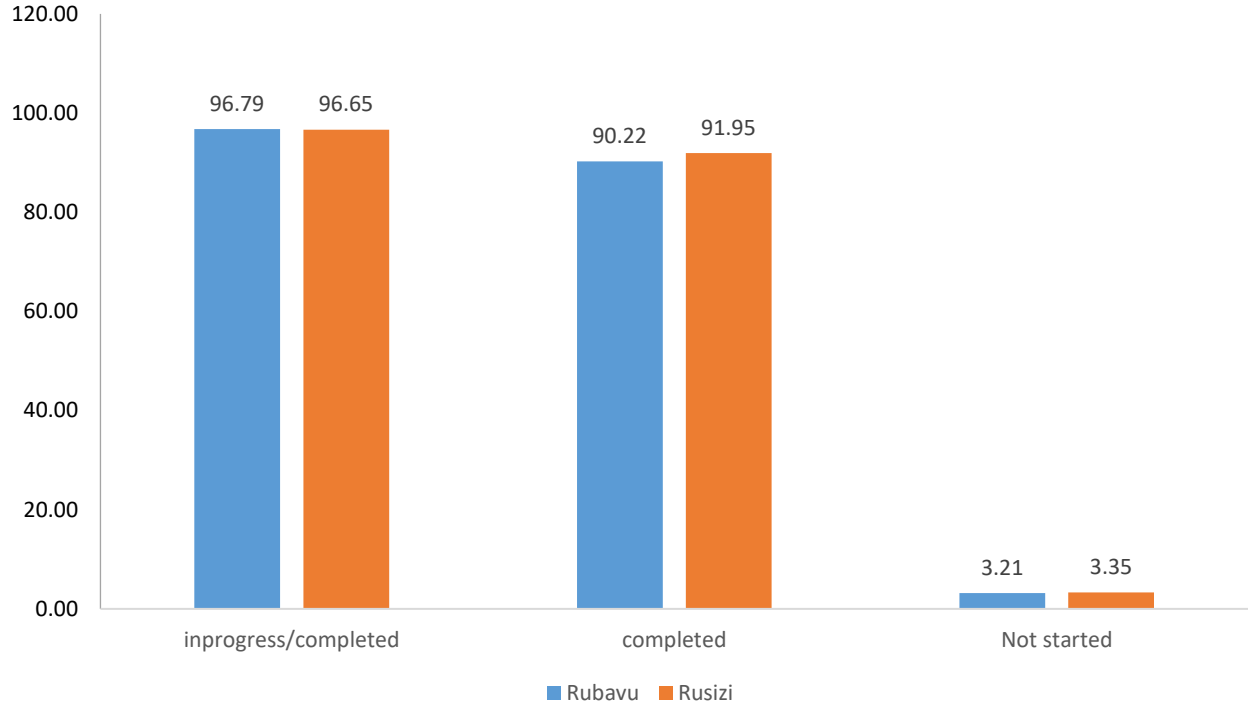
The EBODAC project designed MOTS to be an alternative to the other capacity-building platforms. Ministries of Health all over Africa and donor agencies have emphasized that, since countries are faced by the inadequate staffing norms, implementing partners need to innovate around training platforms that do not take the front line health care service providers from their duty station since this deprives the population of service at the time the staff is attending face-to-

face training.[7] This section of the report shall focus on results and effects of the MOTS training on the CHWs in the Umurinzi vaccination Campaign program.

4.1 Module Uptake per District

The content for the Umurinzi Campaign was broken down into five modules which was further broken down into five units. Taking 1,672 as the overall targeted number of CHWs that accepted and enrolled to the training, 96.7% either completed or were in progress and 3.3% had not started the training at the time training was stopped. The majority (90% of the CHWs) completed training for all the five modules. At the district level, the difference in the percentage of the CHWs who had completed or were in-progress and those who failed to start is less than one percent while that of the CHWs who completed all the five modules is two percent.

Figure 2: CHW Module Progress per District



4.2 CHW Progress by Module

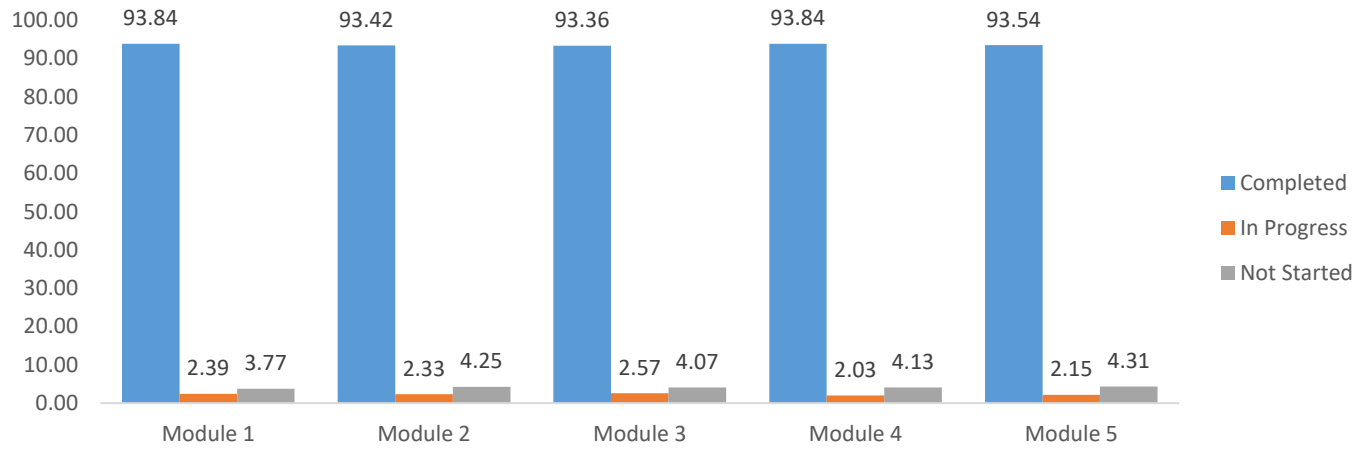
Overall, 90% of the CHWs completed all the five modules while 95.8% had completed at least one module. Completion rate per the number of modules is summarized below;

- *95.1% (n=1524) of these completed all the **five** modules*
- *1.1% (n=18) completed **four** modules*
- *1.4% (n=23) completed **three** modules*
- *1.4% (n=21) completed **two** modules*
- *1.0% (n=16) completed only **one** module*

The graph below summarizes overall CHW progress per module.

Figure 3: CHW Module Progress per Module

[7] Kieran Walsh, Alaster Rutherford, Judith Richardson, Philippa Moore BA, 2010, NICE medical education modules: an analysis of cost effectiveness. See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/49670192.



In Rubavu district, 93% of the CHWs completed modules one and four while 92% completed module two, three and five. About the same percentage of CHWs in Rusizi district, 94%, completed all the modules. The table below presents a better visual of the statistics per district per module.

Table 3: CHW progress module District and Module

District	Module ID	Completed (%)	In Progress (%)	Not Started (%)
Rubavu	Module 1: Ebola Information	93.02	2.79	4.19
	Module 2: Vaccine Campaign Details	92.32	3.07	4.61
	Module 3: Participation Requirements	92.46	2.79	4.75
	Module 4: Vaccine Management	93.58	1.82	4.61
	Module 5: Vaccine Follow-up	92.74	2.37	4.89
Rusizi	Module 1: Ebola Information	94.46	2.09	3.45
	Module 2: Vaccine Campaign Details	94.25	1.78	3.97
	Module 3: Participation Requirements	94.04	2.41	3.56
	Module 4: Vaccine Management	94.04	2.20	3.77
	Module 5: Vaccine Follow-up	94.14	1.99	3.87

4.3 CHW Status on Unit Completion

For simplicity, the training content was divided into smaller units. Each unit consisted of a different topic. The unit started with an introduction of the topic, followed by details and concluded with assessment questions. For every CHW who failed to complete a unit for a given module, the status of completion remained "in progress". The table below outlines details of CHWs' unit status per module. Compared to units one, two and three, most CHWs didn't start/complete the last two units for each module respectively. A CHW had the flexibility to start with any module but units for each module were to be handled consecutively.

Table 4: CHW Unit Progress

Module ID	Unit ID	Completed	In Progress	Not Started	Grand Total
Module 1: Ebola Information	Unit 1: Introduction	1608	0	64	1672
	Unit 2: What is Ebola	1596	1	75	1672
	Unit 3: Ebola transmission	1586	0	86	1672
	Unit 4: Timing of Ebola symptoms	1577	1	94	1672
	Unit 5: Ebola symptoms	1569	0	103	1672
Module 2: Vaccine Campaign Details	Unit 1: Why Western Province	1601	0	71	1672
	Unit 2: Foreigner access to vaccine	1589	0	83	1672
	Unit 3: Vaccine differences	1579	2	91	1672
	Unit 4: Janssen vaccine for Umurinzi	1566	0	106	1672
	Unit 5: Who to call for more information	1562	0	110	1672

Module 3: Participation Requirements	Unit 1: Vaccine eligibility		1	69	1672
	Unit 2: Vaccine ineligibility	1589	1	82	1672
	Unit 3: Vaccine mandate	1574	1	97	1672
	Unit 4: Consequences of non-participation	1563	1	108	1672
	Unit 5: Enrollment requirements	1557	1	114	1672
Module 4: Vaccine Management	Unit 1: Location of vaccine administration	1602	1	69	1672
	Unit 2: Vaccine cost	1594	0	78	1672
	Unit 3: How vaccine given	1589	1	82	1672
	Unit 4: Requirement of 2nd vaccine shot	1579	1	92	1672
	Unit 5: Identification needed to participate	1569	1	102	1672
Module 5: Vaccine Follow-up	Unit 1: Adverse effects	1599	0	73	1672
	Unit 2: Who to call if feeling ill	1590	1	81	1672
	Unit 3: Reminder messages	1583	1	88	1672
	Unit 4: Location to receive 2nd vaccine shot	1572	1	99	1672
	Unit 5: Conclusion	1562	0	110	1672

4.4 Knowledge Levels

This section will focus on the number of correct responses per unit and also how much a CHW scored in the post-MOTS training quiz.

4.4.1 Quiz Responses

As discussed earlier, each unit ended with a question (apart from Unit 1 of Module 1 which was an introduction to the training and Unit 5 for Module five which comprised a conclusion to the training). The MOTS system would mark each quiz question once responded to as correct or incorrect. Additionally, the system allowed the CHW the ability to skip a question if he or she didn't respond to the question in time; however, CHWs may not always be aware they are skipping a question. The table presents a summary of the quiz responses. Those highlighted in yellow are those where the question was skipped almost or more than 400 times. Results in the last column highlight the percent of correct answers; those highlighted in red are those that were below the 80% threshold set by the project and those in purple are those where 50% or fewer responded to the post-test question correctly. Only the question related to vaccine cost met the target. Correct knowledge of Ebola transmission, systems from Module 1, knowledge regarding vaccine differences and information on the Janssen vaccine from Module 2, vaccine eligibility and enrollment requirements from Module 3 were at or below 50%.

Table 5: CHW Quiz Summary

Module ID	Unit ID	Correct	Incorrect	Skipped	Grand Total	% of correctly answered
	Unit 1: Introduction	N/A				
Module 1: Ebola Information	Unit 2: What is Ebola	1120	96	380	1596	70%
	Unit 3: Ebola transmission	739	601	246	1586	47%
	Unit 4: Timing of Ebola symptoms	1138	84	355	1577	72%
	Unit 5: Ebola symptoms	789	506	274	1569	50%
Module 2: Vaccine Campaign Details	Unit 1: Why Western Province	993	65	543	1601	62%
	Unit 2: Foreigner access to vaccine	1055	132	403	1590	66%
	Unit 3: Vaccine differences	786	234	562	1582	50%
	Unit 4: Janssen vaccine for Umurinzi	584	436	547	1567	37%
	Unit 5: Who to call for more information	865	152	545	1562	55%
	Unit 1: Vaccine eligibility	431	801	370	1602	27%
	Unit 2: Vaccine ineligibility	976	117	496	1589	61%

Module 3: Participation Requirements	Unit 3: Vaccine mandate	943	301	330	1574	60%
	Unit 4: Consequences of non-participation	1041	102	420	1563	67%
	Unit 5: Enrollment requirements	583	660	314	1557	37%
Module 4: Vaccine Management	Unit 1: Location of vaccine administration	1124	86	393	1603	70%
	Unit 2: Vaccine cost	1285	82	227	1594	81%
	Unit 3: How vaccine given	974	121	494	1589	61%
	Unit 4: Requirement of 2nd vaccine shot	1139	94	346	1579	72%
	Unit 5: Identification needed to participate	1130	77	362	1569	72%
Module 5: Vaccine Follow-up	Unit 1: Adverse effects	985	213	401	1599	62%
	Unit 2: Who to call if feeling ill	1151	18	422	1591	72%
	Unit 3: Reminder messages	1164	93	326	1583	74%
	Unit 4: Location to receive 2nd vaccine shot	1160	68	344	1572	74%
	Unit 5: Conclusion	N/A				

While the majority of the questions have correct responses between 50% and 74%, questions from Module one (unit 3), Module two (unit 4) and Module three (unit 5) have less than 50% correct responses. Only one question from Module four (unit two) has 80% correct responses. Module four and five both experienced 60% and above in correct responses. Module two had the most skipped responses. The table below consists of detailed questions that presented with the highest number of incorrect responses, which also corresponded with those that had 50% or below correct responses (accounting for skipped questions, etc.)

Figure 4: Summary of Questions with lowest number of correct responses

Module #	Unit #	IVR
Module 1: Ebola Information	Unit 3: Ebola transmission	How is Ebola spread? a) If it is only through blood, or body fluids, Press 1 b) If it is only through objects that have been contaminated with body fluids from a person sick with Ebola or the body of a person who died from Ebola, Press 2 c) If it is only through eating infecting animals such as fruit bats, and primates, Press 3 **d) If all the above, Press 4**
	Unit 5: Ebola symptoms	What are some symptoms of Ebola? a) If they are fever, intense weakness, muscle pain and sore throat, Press 1 b) If they are vomiting, diarrhea, rash, kidney and liver malfunction and bleeding, Press 2 **c) If all the above, Press 3**
Module 2: Vaccine Campaign Details	Unit 3: Vaccine differences	The Janssen vaccine is a two-dose vaccine used to be used on a broad scale? **a) If Yes, Press 1** b) If No, Press 2
	Unit 4: Janssen vaccine for Umurinzi	Which Ebola vaccine is being given in the Umurinzi program? a) If it is Merck, Press 1 **b) If it is Janssen, Press 2**
Module 3: Participation Requirements	Unit 1: Vaccine eligibility	Who will be vaccinated/ Who is Eligible? a) If the Ebola vaccine will be given to people who frequent a region where Ebola outbreak has occurred, Press 1 b) If Ebola vaccine will be given to residents of the Western Province close to a region where Ebola outbreak has occurred, Press 2 **c) If both answers are correct, Press 3**
	Unit 5: Enrollment requirements	What is required to enroll in the Umurinzi program? a) If you have to provide your full demographic information, Press 1 b) If you have to take a passport photo, Press 2 c) If you have to have a scan of your iris, Press 3 **d) If all the above, Press 4**

Outside of the Module 2 question on the brand of Ebola vaccine being given for the trial, the majority of the questions that had low knowledge and high levels of incorrect answers were those that provided a correct answer option of "all of the above" or "both answers are correct." This may mean that CHWs did not listen to all answer options prior to responding or found the "all of the above" answer option confusing.

All Module 2 questions present with the highest number of skipped responses. Content for Module 2 highlighted details of the target beneficiaries of the vaccination program, name of the vaccine, doses of the vaccine and contact for information on the vaccine. Both the quiz questions and responses seem to have been easy to answer. There is no clear reason as to why responses for this module were skipped. A detailed table of questions for all the modules can be found in the annex section.

4.4.2 Post-Test Scores

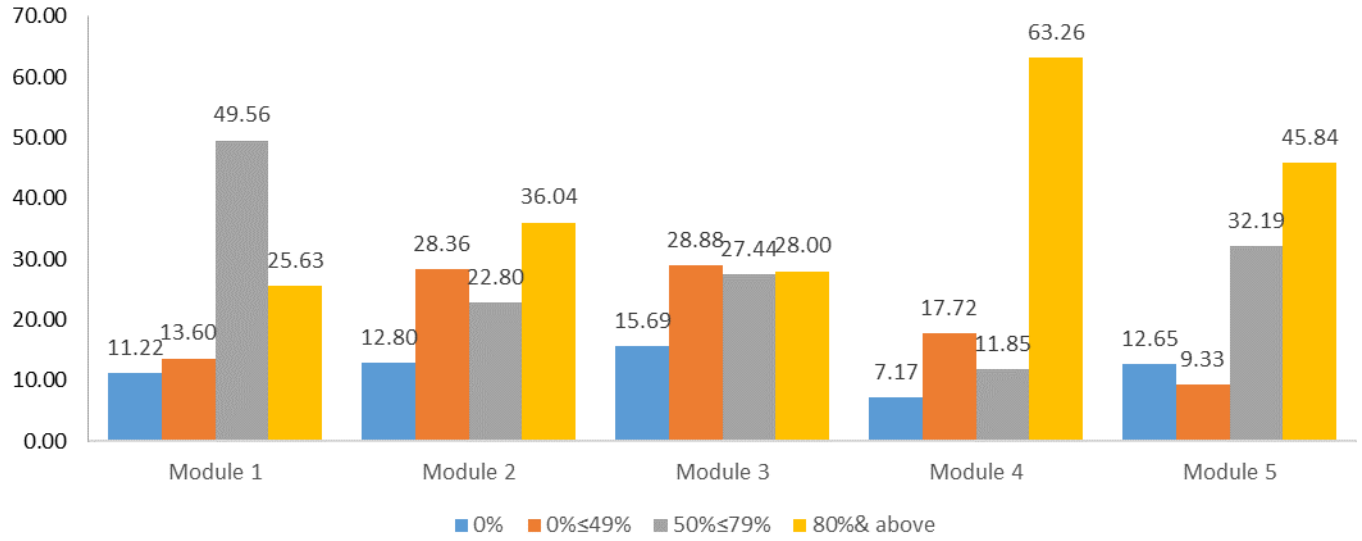
The score for each CHW is calculated as the number of the questions correctly responded to out of the total number of questions. The MOTS system has a component for assessing each CHW's performance in the module quiz. With the absence of a pretest, it's not possible to examine change in knowledge for the CHWs; however, the target of 80% receiving correct answers was established for each module and knowledge levels can be compared to that target. The table and graph below show the number and percentage of CHWs who scored correct answers in the ranges **0%, 0% ≤ 49%, 50% ≤ 79% and 80% & above.** This helps to identify the range of scores where the majority of the CHWs lie.

While the majority scored 50% and above on all modules, only about a quarter scored at the 80% benchmark with the exception being Module 4, where 63% scored 80% and above. Overall, Module 3 performed worst. This is also reflected in the quiz questions in the previous section. Module 3, Units 1 and 5 exhibit the highest numbers of incorrectly answered questions. Module 2 has poor scores as well since it has the highest number of skipped questions.

Figure 5: Number of CHWs per Score Range

	0%	0% ≤ 49%	50% ≤ 79%	80% & above	Total # of CHWs
Module 1: Ebola Information	179	217	791	409	1596
Module 2: Vaccine Campaign Details	205	454	365	577	1601
Module 3: Participation Requirements	251	462	439	448	1600
Module 4: Vaccine Management	115	284	190	1014	1603
Module 5: Vaccine Follow-up	202	149	514	732	1597

Figure 6: percentage of CHW per score range



5.0 Key Observations from the Training Process

It is important to note some of the programmatic challenges that influenced the implementation of the Umurinzi Campaign. The key challenges noted below include challenges related to set up of the MOTS system, training, and supervision and support of the CHWS.

1. The available list of CHWs had missing variables like a sector and facility on which some CHWs were attached to; fortunately, none of the CHWs lacked both. It was either a CHW missed a sector or a facility. This may suggest that the list was not up-to-date and it may be the reason as to why 56 CHWs did not start the training because they may have changed or lost their phone numbers or shifted to other areas, among other reasons but also if the information is not up to date on CHWs, there a limitation as to who is effectively reached by MOTS. Additionally, the list lacked complete information on education, gender and age of the CHWs. This could be helpful in making comparisons amongst the CHWs, particularly when comparing knowledge outcomes. This would further enhance on the awareness for the MOTS team on which category to target for MOTS training and implementation to further programs.

2. The results suggest MOTS being appreciated and welcomed by the majority of the CHWs as a training tool; however, results can be further improved if there is a clear linkage between the CHWs and their supervisor. Like any other training, the supervisor needs to be in the know of what is happening on the ground regarding the trainees. Being a new tool, CHWs required a strong support system on the ground which didn't seem the case during the training. This may also reduce the training period. This is worth noting for the MOH, particularly for any future plans for rolling out the MOTS tool to train the rest of the CHWs in the country.
3. The flashing of the MOTS phone number was affected during the initial stage of the project, which was due to an issue of configuration error between Viamo and MTN Rwanda. But this was resolved within 24 hours and CHWs were informed through their supervisors and they resumed flashing the system. This necessitated the complementary approach of pushing modules to the phones of CHWs at regular intervals.
4. CHW supervisors did not utilise MOTS as it was expected to monitor the progress of the CHWs. Supervisors instead utilised the training reports that were supplied by Grameen Foundation or waited to have in-person interactions with the supervisors by the Rinda Ubuzima community engagement organization. This could be due to language barriers since the reports were all in English or simply because supervisors preferred face-to-face interaction for follow-up.

6.0 Discussion and Conclusion

1. The post-test quiz data indicates that while the majority of the CHWs scored 50% and above in the post training test, only about a quarter of them reached the target of 80% in terms of correct answers, except for Module 4 which focused on Vaccination Management, where 60 percent of the CHWs and above scored 80% and above. Modules 2 (Vaccine Campaign Details) and 3 (Participation Requirements) had the highest numbers of incorrect and skipped responses on their associated quiz questions. There is no clear reason as to why CHWs skipped more questions in Module Two. For the specific units that had the lowest number of correct responses, these questions had answer options of "all of the above" as the last answer options. This suggests that these questions likely didn't capture knowledge levels/attainment and that the questions themselves may be the culprit for low knowledge.
    - **Recommendation: <u>Review content of sessions with particularly low knowledge levels.</u>** For each of the units, the programmatic team will need to consider how important the information is that they are sharing and whether these modules should be revised to ensure that CHWs can correctly answer the quiz questions after listening to the modules or potentially whether they are critical enough that they should be included. In short, what is critical to know versus what is nice to know? For example, given knowledge of the use of the Janssen vaccine was so low even after listening to the session, the question

begs as to why this information is so important to know. If it is critical, the session may require revision prior to expansion.

- **Recommendation: <u>Consider revising questions where the use of "all of the above" is being used as the correct answer option.</u>** It may be possible that this answer option is confusing and that CHWs are answering the question prior to listening to all answer options such that they never hear the option of "all of the above" before they move to the next question.

2. For all modules except for Module 4, approximately 10% and slightly above completed the training and still scored zero percent in the quiz. This either suggests that CHWs simply rushed through the quizzes and responded with the first answer or this may actually suggest that the training content was new or unclear to.
   - **Recommendation: <u>The program team should consider qualitatively interviewing the CHWs to understand how they used the system and answered the quiz questions as well as to understand the difficulties they experienced with some sessions</u>.** For example, in Module 1, Unit 3 on Ebola transmission and Unit 5 on Ebola symptoms seem core to the campaign strategy. While this evaluation posits that the style of question may be to blame for the high rate of incorrect answers, the results should not be dismissed completely, particularly if there was something confusing about the way the information was shared and absorbed by the CHW.
3. A large majority of CHWs skipped quiz questions. These questions were either skipped intentionally or unintentionally. This dilutes a supervisor's ability to assess whether the CHWs participating in the education actually attained or refreshed their knowledge. Real knowledge levels could either be much higher or much lower than the results suggest. This is a significant limitation of these results.
   - **Recommendation: <u>Given there is usually only one quiz question per session, these questions should either be mandatory, meaning a CHW cannot progress to the next unit without answering the questions, and/or there should be appropriate incentives to complete the quizzes based on the number of correct responses.</u>** Where CHWs receive low scores, they may need to repeat the sessions to improve their scores or certificates of achievement could be provided based on meeting the knowledge level targets.
4. The implementation lessons indicate that CHW supervisors did not fully leverage the MOTS system for CHW supervision and support, instead relying on in-person interactions with the Rinda Ubuzima community engagement organization or through receiving updates by the Grameen Foundation team.
   - **Recommendation: <u>Interviews with CHW supervisors should be conducted to understand reasons behind the limited use as well as what their real information needs are and the timing of those needs.</u>** This could inform whether the limited use of the system is due to language barriers, limited interest in the data, limited or no incentives to review, etc. and could guide appropriate future interventions.

7.0 Annex

Detailed questions for the post-training quiz

(Those highlighted in green represent the correct responses.)

Module #	Unit #	Message Title	IVR
Module 1	1	Introduction to the training	
	2	M1_U2 Question	What is Ebola? a) If Ebola is a very contagious disease spread to humans when through direct contact with body fluids of sick patients, Press 1 b) If Ebola is an airborne disease, Press 2
	3	M1_U3 Question	How is Ebola spread? a) If it is only through blood, or body fluids, Press 1 b) If it is only through objects that have been contaminated with body fluids from a person sick with Ebola or the body of a person who died from Ebola, Press 2

			c) If it is only through eating infecting animals such as fruit bats, and primates, Press 3 d) If all the above, Press 4
	4	M1_U4 Question	After how many days following Ebola transmission, do symptoms show up? a) If immediately, Press 1 b) If 2 to 21 days, Press 2
	5	M1_U5 Question	What are some symptoms of Ebola? a) If they are fever, intense weakness, muscle pain and sore throat, Press 1 b) If they are vomiting, diarrhea, rash, kidney and liver malfunction and bleeding, Press 2 c) If all the above, Press 3
Module2	1	M2_U1 Question	Why is Western Province, the target province for the vaccination program? a) If it is because it is highly populated, Press 1 b) If it is because it is close to a region where Ebola outbreak has occurred, Press 2
	2	M2_U2 Question	Can foreigners receive Ebola vaccine? a) If Yes, Press 1 b) If No, Press 2
	3	M2_U3 Question	The Janssen vaccine is a two-dose vaccine used to be used on a broad scale? a) If Yes, Press 1 b) If No, Press 2
	4	M2_U4 Question	Which Ebola vaccine is being given in the Umurinzi program? a) If it is Merck, Press 1 b) If it is Janssen, Press 2
	5	M2_U5 Question	If you need more information on the Umurinzi program, you should call the Ministry of Health on what number? a) If it is 114, Press 1 b) If it is 233, Press 2
Module 3	1	M3_U1 Question	Who will be vaccinated/ Who is Eligible? a) If the Ebola vaccine will be given to people who frequent a region where Ebola outbreak has occurred, Press 1 b) If Ebola vaccine will be given to residents of the Western Province close to a region where Ebola outbreak has occurred, Press 2 c) If both answers are correct, Press 3
	2	M3_U2 Question	Are pregnant women, and children under two years of age allowed to take part in Umurinzi program? a) If yes, Press 1 b) If No, Press 2
	3	M3_U3 Question	Is it compulsory to get Ebola vaccine? a) If participation is voluntary, Press 1 b) If vaccination is compulsory for anyone above two years old, Press 2
	4	M3_U4 Question	Will the law punish you if you don't receive Ebola vaccine? a) If Yes, Press 1 b) If No, Press 2
	5	M3_U5 Question	What is required to enroll in the Umurinzi program? a) If you have to provide your full demographic information, Press 1 b) If you have to take a passport photo, Press 2 c) If you have to have a scan of your iris, Press 3 d) If all the above, Press 4
Module 4	1	M4_U1 Question	Where will the vaccination take place at? a) If it is at the health centers or vaccination sites in Rubavu and Rusizi, Press 1 b) If it is at King Faisal Hospital, Press 2
	2	M4_U2 Question	Will Ebola vaccine be sold to participants? a) If Yes, Press 1 b) If No, Press 2
	3	M4_U3 Question	What part of the body with the vaccine be given? a) If it is the buttocks and thigh, Press 1 b) If it is the arm and thigh, Press 2
	4	M4_U4 Question	Must a person get both vaccine shots? a) If Yes, Press 1 b) If No, Press 2

	5	M4_U5 Question	To participate in the Umurinzi program, you should bring your national ID if you have one or child's vaccination card? a) If Yes, Press 1 b) If No, Press 2
Module 5	1	M5_U1 Question	What are some of the adverse effects that may occur after Ebola vaccination? a) If it may be injection site pain, or headache, Press 1 b) If you can never experience adverse effects, Press 2
	2	M5_U2 Question	What should a person do if he feels sick/ unwell following Ebola vaccination? a) If it is to buy medicines from the pharmacy, Press 1 b) If it is to seek care to the nearest health facility or to call the contact on Umurinzi vaccination card, Press 2
	3	M5_U3 Question	Will vaccinated people continue to receive reminder messages for the second shot? a) If Yes, Press 1 b) If No, Press 2
	4	M5_U4 Question	Is it possible to get the second vaccination shot from the nearest vaccination site if you show your Umurinzi card? a) If Yes, Press 1 b) If No, Press 2
	5	Conclusion to the training	