VOLUME 38, NUMBER 10
October 2021

ISSN 0189 - 160X

WAJM

WEST AFRICAN JOURNAL OF MEDICINE

ORIGINALITY AND EXCELLENCE IN MEDICINE AND SURGERY

OFFICIAL PUBLICATION OF
THE WEST AFRICAN COLLEGE OF PHYSICIANS *AND*
WEST AFRICAN COLLEGE OF SURGEONS

www.wajmed.org

WEST AFRICAN JOURNAL OF MEDICINE

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WEST AFRICAN JOURNAL OF MEDICINE

ORIGINAL ARTICLE

REMOTE SUPERVISION OF BASIC MANAGEMENT UNITS FOR TUBERCULOSIS CARE DURING COVID-19 PERIOD: AN INNOVATIVE EXPERIENCE FROM BENIN REPUBLIC

Supervision à distance des centres de diagnostic et de traitement de la tuberculose en période de COVID-19: une expérience innovante en République du Bénin

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ABSTRACT

Introduction: Contingency measures taken by governments with movement restrictions during the COVID-19 pandemic may create difficulties in conducting some field activities for TB control especially the supervision of Basic Management Units (BMUs). We described in this paper an innovative initiative to conduct remote supervision (E-supervision) using Information and Communication Technology tools.

Setting and Method: This initiative was conducted in Benin Republic. To carry out the activity, we used smartphone, WhatsApp® for messaging, CamScanner for scanning (both free applications); and internet connection. BMUs were asked to scan their reports and all necessary documents and sent them by WhatsApp® after scanning. On the day planned for the supervision, the supervisors of each section (clinic, laboratory, food delivery supervision) calls the BMUs health professionals via WhatsApp® video to conduct the activity according to the National Tuberculosis Programme guidelines.

Results: Overall, all the main objectives of a supervision were achieved despite some difficulties mainly related to the quality of internet connection. The reports from the different sections were validated for each BMU.

For the laboratory activities, general aspects as well as the stock of reagents were evaluated; microcopy fields with an ordinary microscope were visualized. The management of tuberculosis patients was assessed by visualizing the results of bacteriological exams, treatment records, and stocks of medicines.

Conclusion: Even though, this activity will probably not replace the traditional face-to-face supervision, it could be used in settings where movements are restricted for several reasons including COVID-19 pandemic, conflicts and natural disasters.

Keywords: Tuberculosis control, supervision, TB centers, COVID-19.

RESUME

Introduction: Les mesures d'urgence prises par les gouvernements avec des restrictions de mouvements dans le cadre de la pandémie du COVID-19 peuvent créer des difficultés dans la conduite de certaines activités de terrain pour le contrôle de la tuberculose, en particulier la supervision des centres de dépistage et de traitement de la tuberculose (CDT). Nous avons décrit dans cet article, une initiative novatrice pour effectuer la supervision à distance (E-supervision) en utilisant les outils des Technologies de l'Information et de la Communication au Bénin.

Cadre et Méthode: Cette initiative a été conduite en République du Bénin. Pour mener à bien cette activité, nous avons utilisé : smartphone, WhatsApp pour la messagerie et CamScanner ® pour le scannage (deux applications gratuites) ; et la connexion internet. Les agents des CDT ont été invités à envoyer tous les documents aux équipes de supervision via WhatsApp ® après les avoir scannés. Le jour prévu pour la supervision, les superviseurs de chaque section (clinique, laboratoire, gestion des vivres) ont appelé par WhatsApp ® video les acteurs des CDT pour dérouler les différentes séquences de la supervision selon les recommandations du Programme.

Résultats: Dans l'ensemble, tous les principaux objectifs d'une supervision ont été atteints malgré quelques difficultés liées principalement à la qualité de la connexion internet. Les rapports des différentes sections (clinique, laboratoire et gestion des aliments) ont été validés pour chaque CDT.

Pour les activités de laboratoire, l'aspect général ainsi que le stock de réactifs ont été évalués ; les champs de microcopie avec un microscope ordinaire ont été visualisés. La gestion des patients tuberculeux a été évaluée en visualisant les résultats des examens bactériologiques, les dossiers de traitement, les stocks de médicaments.

Conclusion: Bien que cette activité ne remplacera probablement pas la supervision traditionnelle en face à face, elle pourrait être utilisée dans des contextes où les mouvements sont limités pour plusieurs raisons, notamment la pandémie COVID-19, les conflits, les catastrophes naturelles.

Mots clés: Lutte contre la tuberculose, COVID-19, supervision, centres antituberculeux

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INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) infection, currently known as COVID-19 infection, which was declared a pandemic by the World Health Organization (WHO) on 11th March 2020 poses a huge threat to health systems worldwide.[1] This threat has been thought to be more worrisome for developing countries whose health systems are dominated by lack of skilled personnel and inadequate resources and a relatively fragile health delivery process.[2] The first case of COVID-19 in Benin was notified on 17th March 2020 leading to significant changes in the country.[3]

In the current context, there is a high risk of services discontinuity.[2] Of all the diseases prone to harmful consequences as a result of COVID-19 diversion, tuberculosis (TB) is on the forefront. TB and COVID-19 share similar respiratory symptoms, particularly cough, fever and shortness of breath.[4,5] Furthermore, patients with these conditions are stigmatized; and this can negatively impact TB control.[5,6] This can result in a substantial drop in the number of notified TB cases, with consequent increase in the transmission of tuberculosis within the community.[7]

In addition, the restrictive measures taken by the government as part of the response to the COVID-19 pandemic prevented the execution of some core activities of the National Tuberculosis Control Programme (NTP) including supervision. The purpose of supervision is to guarantee that programme guidelines are complied with as regards to screening, diagnosis and management of TB cases.[8] Failure to carry out such an important activity can have damaging consequences on the performance of NTPs. Thus, it is crucial for NTP managers to innovate new ways of doing supervision. This article reported about a novel experience of supervision using Information and Communication Technology (ICT) tools, called E-supervision.

Setting and Method

Description of Benin

Benin is a West African country, bordering the Atlantic Ocean in the South, Nigeria in the East, Togo in the West, Niger in the North and Burkina Faso in the Northwest. With a surface area of 114800 Km^2, its population is estimated at about 12 million inhabitants.[9] The country has been classified as a low and middle-income country in a recent World Bank ranking.[10]

Benin has the same burden and pattern of diseases as other LMIC countries, with malaria, HIV and TB considered as priority diseases.[11] TB case notification rate has been between 35 and 40 cases per 100,000 inhabitants for the last ten years.[12,13]

Organization of TB control in Benin.[14]

TB control is managed by the National Tuberculosis Control Programme (NTP) which is organized in three levels modelled on the pyramidal structure of the health system (central, intermediate, and peripheral or operational). The management of tuberculosis cases is carried out at the operational level in 82 Basic Management Units (BMUs) throughout the country. In addition to the organization of tuberculosis diagnosis and treatment, the programme also provides some foods (fresh foods in the vast majority of the cases) to support TB patients throughout the treatment course. Moreover, the programme has a monitoring-evaluation system which allows for periodic monitoring of practices on the field. This monitoring system involves regular supervision of BMUs. In Benin, this supervision is carried out on a quarterly basis and allows the central level, in collaboration with the intermediate level, to assess the operational level by evaluating the implementation of directives and recommendations, verifying data and validating reports. During this activity, which is crucial to the programme's performances, three aspects are evaluated: laboratory activities, TB treatment and follow-up (the clinic) and management of the food support.

Within the current context related of COVID-19 pandemic, the NTP Benin has developed a contingency plan to minimize the impact of the pandemic on programme outcomes, including the E-supervision.

Organization of E-supervision

Preparatory phase

ICT tools choice

Smartphones regardless of brand or operating system were used. This tool was preferred over the classic computer, due to its wide availability among health professionals. It also offers the valuable advantage of portability and it does not require special training for its basic use.

The second tool consists of applications such as WhatsApp ® and CamScanner ®.

WhatsApp is a free audio/video calling application that is very popular and widely used by the vast majority of people including health professionals. This application is very easy to use and does not require any special training.[15] It also allows the transmission of files in various formats (word, pdf, jpeg, etc) and this can be particularly useful to share documents between the BMU team and the supervision team.

CamScanner ® is a free application that allows documents to be scanned using the camera built into smartphones and transformed into a pdf format.[16] This application is compatible with WhatsApp®.

Both applications can be downloaded from Play store for Android based phones and App store for iPhones.

Lastly, internet connectivity was the third ICT tool identified at the preparatory phase. We used the two most reliable and widest covering internet service providers (ISP) in Benin Republic, MTN and MOOV companies' networks.

Information/training for various actors

As a first step, an information meeting was held to present the initiative to the supervisors' team at the programme coordination level. The different aspects as well as the adaptations needed to make this experience a success were discussed. In a second phase, an information session was organized with the field actors by group: physicians, laboratory technicians, nurses, food support managers. This was a one-hour virtual meeting via WhatsApp® during which the E-supervision initiative was presented, the procedures for scanning and sending documents were discussed and shared on the fora. The session presented an opportunity to address concerns from the field actors about the initiative. The schedule for conducting the E-supervision taking into account the different sequences, were then highlighted. The period of sending documents by the BMUs, list of documents to be scanned, and scheduled supervision date in each BMU were shared and discussed.

Activation of internet packages

The programme coordination team offered a 15 GigaBytes (GB) internet connection to each BMU actor, namely: one physician, one nurse (the TB focal point), one laboratory technician and one person in charge of food delivery management to TB patients. The cost of this package was approximately €92 for each BMU. Before activating the packages, it was necessary to ensure that the WhatsApp numbers of the actors in the different WhatsApp groups were updated. The NTP has been using WhatsApp for several years to reliably share information between all the professionals involved in TB control in Benin Republic.

Ethical aspects

In order to respect the confidentiality of the data shared via WhatsApp, the documents were sent to one contact person for each section: clinic, laboratory and food delivery supervision. This allowed us to limit the number of people who have access to patient data to the barest minimum, particularly in the registries. These data were centralized and kept on a passworded secure computer. Thus, only those usually mandated to collect data during the traditional field supervision got access to the data sent by the peripheral level.

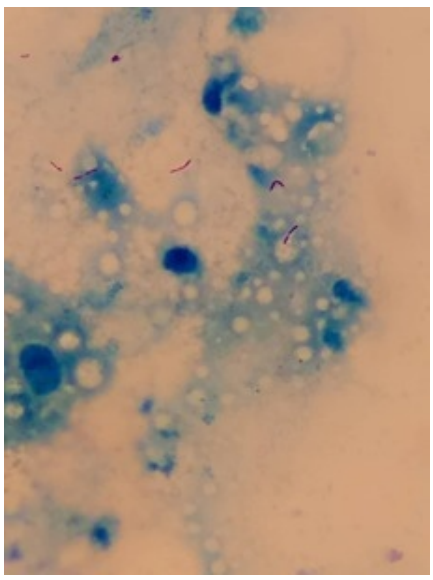
Relaying the documents

A period of three days was scheduled for BMUs to send the following documents via WhatsApp® after scanning: screening reports and cohort reports, registers and other required tools.

The sending of these reports and source documents prior to the supervision allowed teams to verify the data and validate the various reports before the scheduled supervision day and then to reduce the time needed for remote supervision.

The supervision process

The day before the meeting, a reminder was sent by the supervision team members and a convenient start time was set with the peripheral level officers.



On the supervision day, the supervisor of each section (clinic, laboratory, food delivery supervision) called the scheduled BMUs health professional for supervision via WhatsApp® video call.

The various supervision sequences were then carried out: verification of data, validation of reports and discussion of any discrepancies.

Achievements

Overall, the objectives of the E-supervision were achieved despite some difficulties which will be discussed later.

The reports from the different sections (clinic, laboratory and food management) were validated for each BMU.

For the laboratory activities, activity log books, as well as the stock of reagents were evaluated; microcopy fields with an ordinary microscope (Ziehl Nielsen staining, ***photo 1***) were visualized.

The management of tuberculosis patients was assessed by visualizing the results of bacteriological exams, treatment records, stocks of medicines, etc.

Lessons learned

The implementation of the E-supervision was fraught with a few challenges that were circumvented by the team.

First of all, the activation of the internet packages was more time-consuming than planned. Initially, updating the WhatsApp® telephone directory of all the field actors involved in the activity had to be done. Then, it was necessary to activate the internet connection for each phone number for nearly 250 people out of the 332 people involved in the activity. The excitement generated by obtaining this internet package put enormous pressure on the research team which had to manage the pressing requests of the field actors and work day and night for a whole weekend

to meet the deadlines. The lesson we have learned from this is that when planning E-supervision, a minimum of one week should be allotted to this internet package activation task. This leaves enough time to correct any mistake and attend to all complaints from participants.

Secondly, the quality of the internet connection was critical to the implementation of the E-supervision. WhatsApp® video calls in particular need more bandwidth to allow supervisors to have visual contact with the actors in the field. The quality of the connection varied with the regions and the connection periods. It was almost impossible to make video calls in 15 out of the 82 BMUs (18 %). In these cases, the supervision team made audio calls/short audio messages via WhatsApp® or, failing which, telephone calls were made to the BMUs teams. In some cases, the field teams were asked to send photos to verify some documents. These alternative strategies have been highly helpful in the face of poor internet connection-related challenges encountered with some BMUs. With this experience, we have thus demonstrated the possibility of achieving a supervision activity, even wherever there is a challenge with internet connection, provided the necessary reports and documents have been sent by the BMU teams prior to the supervision day.

Lastly, it was not possible to carry out certain important supervisory tasks. This includes making comparison between laboratory files and patient care records to check for any discrepancy, detecting any abnormality during the laboratory process, and accurately assessing physical stock of reagents, medicines and patients' foods.

DISCUSSION

The implementation of E-supervision raised great interest and curiosity among health workers involved. They realized the potential of the initiative and did their best to contribute to its success.

Overall, the main objectives of evaluating the compliance to national guidelines for TB diagnosis and care in BMUs were achieved. In addition, this activity facilitated continued contact with the BMUs health workers and helped to encourage them to promote the necessary continuity of tuberculosis control activities in difficult times like COVID-19 as recommended by WHO.[6] Continuity in TB care provision is mandatory to avoid the negative consequences that the COVID-19 pandemic may have on TB control. According to a modelling carried out by the Stop TB Partnership and published in early May 2020, a three-month containment could set back the global fight against tuberculosis by 5 to 8 years.[17] Even though not all countries have responded to the pandemic in the same way in terms of confinement, it is logical to assume that the limitations in movement and stigma generated by the current context would be dramatic for TB control in many countries if adaptive measures to ensure continuity of TB services are not implemented.[5] The organization of remote supervision is part of the Benin NTP's plan to ensure the continuity of tuberculosis control activities. The results obtained show that it is possible to carry out this activity and to achieve the main objectives of supervision remotely. However, due to some limitations and constraints, we think that E-supervision cannot replace traditional supervision. Firstly, the performance for tasks requiring the inspection of several data sources was not optimally executed. Furthermore, challenges related to the quality of the internet connection hindered the conduct of this activity, pushing the supervisors to find solutions in order to achieve the objectives. In addition to the above, the type of the smartphones certainly played a major role in the quality of the documents sent by the BMUs agents to the supervisors. This constraint can be overcome by providing BMUs with tablets that could also be used for other activities in line with e-solutions.

A crucial point to be taken into account during implementation of such approach is assurance of patient data confidentiality. WhatsApp® is an end-to-end encrypted application. Thus, the messages exchanged between users are only decipherable on the sending and receiving devices; it is thus very unlikely that a third party device would have access to the information. This feature makes it possible to secure the data that is shared between BMUs actors and supervisors. However, sending nominative data with the BMUs registers still pose some confidentiality challenge. In order to limit the risk of disclosure of the above, we ensured that all documents were sent to one person, who was responsible for dispatching the data to the different teams. This hopefully restricted their access to the barest minimum. One solution to be experimented in subsequent projects would be the use of registers with patient identification numbers, instead of patient names.

CONCLUSION

E-supervision has been of great help to ensure continuity of priority TB supervision activities in the difficult context of COVID-19. Despite some challenges and limitations, especially with internet connection, the exercise was largely successful. Although, this activity will probably not replace the traditional supervision, the NTP coordination team intends to capitalize on this experience and improve on it with subsequent E-supervisions. The initiative could also be considered in other sub-Saharan African settings where movement may be restricted for several reasons including COVID-19 pandemic, conflicts, natural disasters.

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