Fourth annual meeting of the network of Buruli ulcer PCR laboratories in the WHO African Region

Mundi complex, Yaoundé,
24–26 October 2022

World Health Organization

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Annexes

The World Health Organization (WHO) is grateful to the participants of the fourth (hybrid) meeting of the network of Buruli ulcer PCR laboratories (BU-LABNET) in Africa at the Mundi complex in Yaoundé, Cameroon, on 24–26 October 2022.

The meeting was organized by the Pasteur Centre of Cameroon (CPC) and the WHO Department of Control of Neglected Tropical Diseases (WHO/NTD), supported by the Anesvad Foundation and American Leprosy Missions.

The report was prepared by Mr Hycenth Numfor and Dr Sara Eyangoh (BU-LABNET Coordinating Centre, CPC) and reviewed by the meeting participants and the BU-LABNET advisory board. Dr Kingsley Asiedu (WHO/NTD) provided technical oversight along with Dr Priya Pathak (WHO/NTD). Ms Félicité Bana Owona and the CPC Communications Department gave administrative support.

Funding for the meeting was provided by the Anesvad Foundation, the Raoul Follereau Foundation and the American Leprosy Missions.

BU-LABNET	Buruli ulcer laboratory network
COVID-19	coronavirus disease
CPC	Pasteur Centre of Cameroon
ITM	Institute of Tropical Medicine
NTD	neglected tropical disease
PCR	polymerase chain reaction
SOP	standard operating procedure
WHO	World Health Organization

01

Introduction

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02

Introduction

In October 2019, WHO convened the first meeting of the Buruli ulcer laboratory network (BU-LABNET) in Yaoundé, Cameroon, bringing together 11 laboratories from nine countries at the Pasteur Centre of Cameroon (CPC), the network's Coordinating Centre. The network was formally established at this meeting *(1)* and its members were those present. The objective of BU-LABNET is to improve diagnosis of Buruli ulcer based on polymerase chain reaction (PCR) using standardized testing protocols, involving external quality assurance programmes and sharing knowledge among member laboratories.

In July 2020 and December 2021, two further meetings were held virtually owing to the coronavirus disease (COVID-19) pandemic and associated disruptions. Given the gradual easing of COVID-19 restrictions and resumption of activities, it was decided to organize the fourth meeting onsite, with online participation for those unable to attend in person.

The fourth annual meeting of BU-LABNET was held at the Mundi complex in Yaoundé, Cameroon, on 24–26 October 2022. The meeting agenda is attached as Annex 1 and the participants are listed in Annex 2.

02

Objectives of the meeting

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03

Objectives of the meeting

The overall objective of the meeting was to review the progress of BU-LABNET and plan activities for 2023. The specific objectives were:

- to present updates on activities including challenges encountered;
- to share ideas on how to enhance the visibility of the network through collaborative studies and publications;
- to discuss the integration of PCR-based case confirmation with that for other skin-related neglected tropical diseases (skin NTDs);
- to review and adopt the updated standard operating procedures (SOPs) for Buruli ulcer;
- to brainstorm on concrete activities to implement in 2023; and
- to discuss harmonization of procedures for PCR-based diagnosis of yaws.

03

Topics for discussion

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04

Topics for discussion

The following topics were reviewed and discussed:

- epidemiology and geographical distribution of skin NTDs in WHO's African and Eastern Mediterranean regions;
- BU-LABNET activities including those conducted by the Coordinating Centre, and challenges and status of member laboratories;
- activities of member laboratories, including research;
- PCR protocols for yaws, cutaneous leishmaniasis and mycetoma;
- SwiftX technology;
- integration of priority skin NTDs in the different network laboratories; and
- perspectives for collaborative studies.

3.1 Epidemiology and geographical distribution of skin NTDs in the WHO African and Eastern Mediterranean regions

Dr Augustin Kadima and Dr Yves Barogui (WHO Regional Office for Africa) presented the epidemiology and geographical distribution of Buruli ulcer, yaws, leprosy and cutaneous leishmaniasis in the WHO African Region. Professor Ahmed Fahal (Mycetoma Research Center) presented the mycetoma situation in the WHO Eastern Mediterranean Region. The NTD road map targets for 2030 *(2)* were also presented.

3.2 BU-LABNET activities

Dr Sara Eyangoh (BU-LABNET programme coordinator) summarized the milestones registered to date. The main challenge raised was that of communication to enhance the visibility of the network's activities. The strengths of the 11 member laboratories and areas for improvement are shown in Fig. 1.

The formal status of member laboratories was raised as an important issue, and it was agreed to establish a membership certificate (Annex 3). Certificates were duly produced, signed and awarded to all the member laboratories present at the meeting.

Revisions to the SOPs of the network were discussed. The SOPs were shared before the meeting with member laboratories for review and feedback. All comments were consolidated and re-shared with members before a final consolidated version 2 was prepared.

3.3 Member laboratory activities including research

Representatives from the member laboratories of the network presented updates of their activities using the reporting template. Discussions focused on PCR test statistics for 2022, challenges, planned activities for 2023 and perspectives from the individual laboratories.

It was noted that:

- the number of samples received and tested by laboratories has fallen; and
- laboratories require additional training or refresher on diagnosis of Buruli ulcer.

During the update on research activities, five laboratories presented ongoing research studies, including general objectives, collaborating teams, results (if any) and next steps.

Dr Dziedzom de Souza (Foundation for Innovative New Diagnostics [FIND]) shared progress on research titled "A Buruli ulcer mycolactone rapid diagnostic test to enhance early diagnosis and treatment" implemented in Cameroon and Côte d'Ivoire.

Dr Michael Frimpong (Kumasi Centre for Collaborative Research in Tropical Medicine) presented on the "Development and validation of a portable, point-of-need *Mycobacterium ulcerans* qPCR test" study carried out in Cameroon and Ghana.

Both studies aim to decentralize diagnosis of Buruli ulcer to peripheral laboratories to facilitate access to diagnosis.

Dr Richard Akuffo (Noguchi Memorial Institute for Medical Research) discussed global perspectives and research history of cutaneous leishmaniasis in Ghana and summarized recent research conducted in the Oti Region of Ghana.

Strengths	Areas for improvement
• Motivated staff performing PCR for BU in all the laboratories • Well characterized three-room set-up for quantitative PCR-based diagnosis (10/11) • Turnaround time for result delivery is within a week on average (9/11) • BU-LABNET SOPs available and used by all laboratories	• Personnel capacity building (refresher) on the PCR technique (3/11) • Equipment maintenance, calibration and certification (9/11) • New batch reagent validation prior to use, and general inventory of BU materials (9/11)

Fig. 1. BU-LABNET strengths and areas for improvement

The network offers an important opportunity to conduct or participate in multicentric research activities, including clinical trials evaluating new drug treatments, diagnostic tools, molecular epidemiology and mapping studies, as well as surveillance of antimicrobial resistance. Some member laboratories are already carrying out research studies in collaboration with other institutions and/or partners.

3.4 PCR protocols for cutaneous leishmaniasis, mycetoma and yaws

The vision of the network is to integrate other skin NTDs in the Buruli ulcer platform. As countries with diagnostic capacity for these diseases are identified, existing PCR protocols will be harmonized using the same approach as for the PCR-based protocols for Buruli ulcer. A session was thus dedicated for presentations of diagnostic protocols currently used for yaws, cutaneous leishmaniasis and mycetoma.

Dr Serges Tchatchouang (CPC) presented the yaws PCR protocols.

Dr Sara Eyangoh (CPC) spoke about the implementation of yaws differential diagnosis, specifically the detection of *Haemophilus ducreyi*.

Dr Javier Moreno and Dr Carmen Chicharro (Carlos III Health Institute) presented the PCR protocols for cutaneous leishmaniasis.

Dr Wendy van de Sande (Erasmus Medical Center) and Professor Ahmed Fahal (Mycetoma Research Center) presented the PCR protocols for mycetoma.

To address the geographical distribution of mycetoma in the different endemic countries and the prevalent pathogens therein, it would be important to conduct a study to demonstrate evidence of the majority of the identified mycetoma pathogens. It would also be necessary to conduct a molecular identification survey for mycetoma to show evidence of the specific pathogens prevalent in endemic countries.

3.5 SwiftX technology

Dr Andy Wende (Xpedite Diagnostics GmbH) described the SwiftX technology and the advantages of the DNA extraction kits.

The presentations are available online *(3)*. Photographs of the participants are shown in Annex 4.

3.6 Priority skin NTDs for integration in the different network laboratories

The possibility of advancing the current platform to capture the new vision of the network – integrating other skin NTDs into the Buruli ulcer platform – was discussed with the experts on yaws, cutaneous leishmaniasis, mycetoma and leprosy.

Integration will consider disease epidemiology in each of the network countries, sampling techniques, PCR testing and standard protocols available for each disease. This implies the importance of a needs assessment to guide future actions. It was agreed to start integration with yaws.

3.7 Perspectives for collaborative studies

Four working groups were created (Fig. 2). The discussion was led by Professor Richard Phillips (Kumasi Centre for Collaborative Research in Tropical Medicine). The recommendations arising from the group discussions are summarized below.

3.7.1 Group 1 discussion and recommendations

The group is expected to develop guidance that includes the objectives of the collaborative study, the expected results and the implementation strategy.

Recommendations

- Perform a review of non-*M. ulcerans* ulcers.
- Explore any potential collaboration for mycetoma using artificial intelligence.

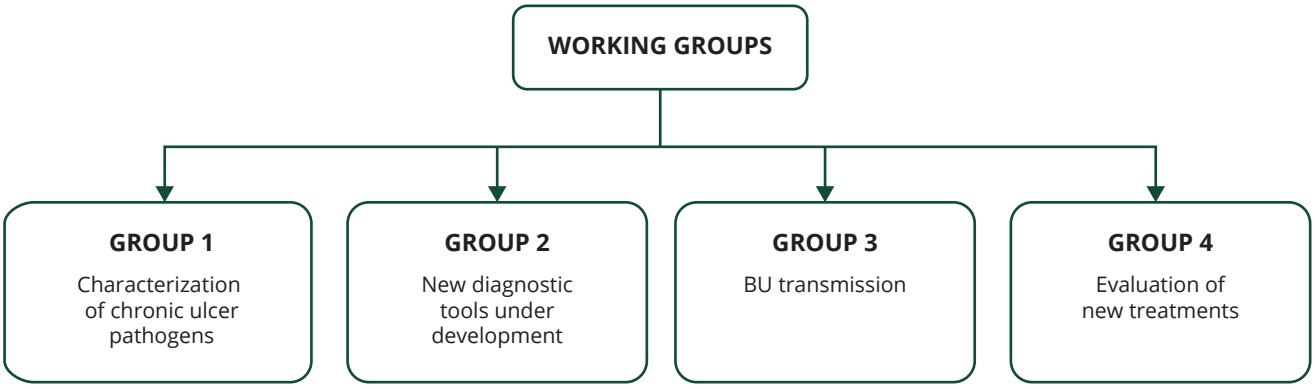

Fig. 2. BU-LABNET working groups for collaborative studies

- Investigate the causes of ulcers not due to Buruli ulcer, yaws, cutaneous leishmaniasis and mycetoma or from *H. ducreyi*.
- Share images and data of chronic wounds in question with the network.
- Develop a differential diagnosis for each skin NTD.

3.7.2 Group 2 discussion and recommendations

FIND and WHO already support the development of some assays (prototype methods available), and the network could be partners in evaluating these diagnostic tools.

Recommendations

- Optimize evaluation protocols (the network should work on this).
- Consider signing an agreement to share samples available in countries among the laboratories.
- Develop a material transfer agreement and an SOP for sample conservation.

3.7.3 Group 3 discussion and recommendations

The existing tools for transmission research have been exhausted. Besides whole genome sequencing, other approaches may not address the distribution of *M. ulcerans* or identify potential reservoirs of bacterium.

Recommendations

- Investigate available studies on the risk factors of mycetoma transmission.
- Propose a study to sample the asymptomatic families of affected persons.

3.7.4 Group 4 discussion and recommendations

The main role of the network laboratories in different treatment studies would be to provide diagnostics. Also, the network website could be updated with post-research proposals; interested persons will join the discussions.

Recommendations

- Identify the role of the network in different treatment studies.
- Share post-research proposals on the network's website to facilitate submitting research proposals and advancing work.

Additional group work on the **visibility of the network** was presented by Professor Phillips and is summarized in the Table below. The target audience is funders, scientific community, national programmes, media, biotech companies, health ministries, other networks, organizations and the general public.

Table. Measurement of success and responsibilities, by activity

Activity	How do we want to measure success?	Who is responsible?
Website	Track site visits.	Coordinating Centre Web designer and content builder Remote developer/designer and maintenance
	Provide regular updates (photos on website, member laboratory posts network activities, member laboratory profiling, link of published articles, post grant awards or other achievements, short statements from scientist on the work of the network, regular scientific interviews about activities of the network, information on skin NTDs for public education, link website to other social media platforms (e.g. Twitter, LinkedIn – Institutional website should have a link to the network website)).	Network members Coordinating Centre Anesvad Foundation communication department
Social media handles (Twitter, Facebook, LinkedIn, WhatsApp)	Provide website link to tweets or other posts on social media. Post quarterly/biannual quizzes on social media handles for young upcoming scientists.	Member laboratories Coordinating Centre Partners
Scientific publications	Track publications by network members.	Coordinating Centre/scientists Partners
Presence at large meetings (e.g. WHO, ASTMH, ECMID, WHS)	Maximize number of and participation at meetings.	Coordinating Centre Member laboratories Partners
Prepare fliers/posters for major meetings (e.g. WHO, ASTHM)	Track the numbers of fliers and posters. Print and distribute to laboratories (in English and French) in high resolution.	Coordinating Centre Partners
Organize webinars on the activities of the network	Record the number of webinars organized. Host webinars on NTDs (ISNTD).	Coordinating Centre
	Design a course on molecular diagnosis of Buruli ulcer to post on the OpenWHO training platform.	Coordinating Centre Member laboratories for support Partners

ASTMH: American Society of Tropical Medicine and Hygiene; ECMID: European Congress of Clinical Microbiology and Infectious Diseases; ISNTD: International Society for Neglected Tropical Diseases; WHS: World Health Summit.

04

Recommendations and activities to be carried out in 2023

05

Recommendations and activities to be carried out in 2023

4.1 For the Coordinating Centre

- Implement activities to improve the visibility of, and communication around, the work of BU-LABNET. The focus here is to increase visibility among the general public through the website and social media.
- Finalize the reviewed SOPs on Buruli ulcer, obtain approval from the advisory board and distribute to member laboratories.
- Establish certificates of external quality assurance participation for distribution to participating laboratories in 2022.
- Finalize the global report of on-site laboratory evaluation of BU-LABNET member laboratories.
- Follow up on the harmonization of procedures to integrate skin NTDs under the responsibility of/in collaboration with disease experts.
- Promote all collaborative research on skin NTDs.
- Build an online system for laboratories to report data on their activities in DHIS2. This system would be used by laboratories in the network (laboratories in the WHO Region) to enter data which will then be transferred to the central database at the Coordinating Centre.
- Standardize data sharing agreements and material transfer agreements among the member laboratories to enhance collaborative work.
- Encourage best practices and research ethics for diagnosis and treatment of Buruli ulcer and other skin NTDs as prioritized by the network.

4.2 For member laboratories

- Commit to raising the visibility of BU-LABNET according to its activities and the established communication strategy.
- Continue to use the updated SOPs for diagnosis of Buruli ulcer and other skin NTDs as provided by the Coordinating Centre.
- Improve collaboration with national control programmes and convene in-country meetings to harmonize data on Buruli ulcer activities.
- Participate in the external quality assurance programme.
- Collaborate with the Coordinating Centre towards integrating other skin NTDs (yaws, *H. ducreyi*, cutaneous leishmaniasis and leprosy) in the Buruli ulcer PCR platform.
- Furnish the Coordinating Centre with working PCR protocols on yaws, leprosy and cutaneous leishmaniasis to help in the harmonization procedure.
- Make efforts to encourage research collaboration among member laboratories and to share opportunities for collaboration.
- Ensure timely reporting of laboratory PCR data on Buruli ulcer to the national programmes and the BU-LABNET Coordinating Centre.

4.3 For national Buruli ulcer control programmes

- Strengthen collaboration with BU-LABNET member laboratories in training field workers on activities against endemic skin NTDs.
- Promote active case searches among communities, harmonize sample collection techniques in facilities and ensure timely transfer of samples to member laboratories.

4.4 For partners

- Support the BU-LABNET Coordinating Centre to achieve its objectives on visibility, development of standard documents and coordination of scientific studies.
- Explore additional funding avenues to sustain network activities.

4.5 For WHO

- Help to raise awareness of BU-LABNET at all levels.
- Advocate for support of the network's activities.
- Share experiences from other laboratory networks (e.g. malaria and tuberculosis).
- Facilitate training of laboratories through the Coordinating Centre.

05

Closing remarks and next meeting

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Closing remarks and next meeting

After the customary exchange of courtesies, the meeting was closed.

The next meeting will be held in Ghana on 23–25 October 2023.

References

1. First meeting of the network on Buruli ulcer PCR laboratories in the WHO African Region, Centre Pasteur du Cameroon, Yaoundé, 21–24 October 2019. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/333592, accessed 23 June 2023).

2. Ending the neglect to attain the sustainable development goals: a road map for neglected tropical diseases 2021–2030. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/338565, accessed 23 June 2023).

3. BU-LABNET 2022 presentations, recommendations and pictures (https://www.dropbox.com/sh/8mi7lxdiq0cld8y/AAAHLUw3bN-K9BEbPTmofXYqa?dl=0, accessed 23 June 2023).

Agenda

Day/Time	Topic	Speaker
Monday, 24 October 2022 (Day 1)		
09:00–09:30	Arrival of participants and registration	All
09:30–10:00	Opening ceremony	Mirdad Kazanji
	Welcome speeches by the Centre Pasteur, WHO and MOH	Phanuel Habimana
		Minister of Public Health
10:40–12:40	Presentation on the epidemiology and geographical distribution of skin NTDs in Africa (AFRO and EMRO)	Yves Barogui
		Ahmed Fahal/Augustin Kadima
13:30–16:30	Updates on BU-LABNET activities	Sara Eyangoh
	Validation of the revised BU-LABNET SOPs	Hycenth Numfor
	Assessment of network laboratories: key findings	
	Discussion on the laboratory network member status	All
16:30–17:00	Presentation of network laboratory activities	Network laboratories
	Presentation plus discussion: 15 mins for each laboratory	
	Discussion and closing	Kingsley Asiedu
Tuesday, 25 October 2022 (Day 2)		
08:30–09:30	Presentation of yaws qPCR protocols	Representative of yaws consortium
10:00–11:00	Discussion: Steps for implementation/integration of yaws in Buruli ulcer diagnosis platform	Representative of yaws consortium/Sara Eyangoh
11:00–11:30	Possible implementation of *Haemophilus ducreyi* and yaws differential PCR	Sara Eyangoh/representative of yaws consortium
11:30–13:00	Research updates by member laboratories	Network laboratories
14:00–15:00	Presentation of cutaneous leishmaniasis PCR protocols	Javier Moreno/Carmen Chicharro/Israel Cruz
15:00–16:00	Presentation of cutaneous mycetoma PCR protocols	Ahmed Fahal/Sahar Bakhiet
		Wendy van de Sande
16:00–17:00	Discussion and closing remarks	Kingsley Asiedu
Wednesday, 26 October 2022 (Day 3)		
08:30–09:30	Discussion on other priority skin NTDs to integrate in the different network laboratories	Invited experts on skin NTDs
10:00–10:30	Presentation of the SwiftX technology and advantages of the DNA extraction kits	Andy Wende
10:30–12:30	Discussion on development of collaborative studies: Working groups	Experts plus network laboratories
13:30–15:00	Restitution and discussion	All
15:00–16:00	Recommendations and closing remarks	Sara Eyangoh, Sundeep Vedithi

List of participants

BU-LABNET members

Benin

Ms Line-Marlène Ganlonon, Centre de Dépistage et de Traitement de l'Ulcère de Buruli, Pobè

Cameroon

Ms Brigitte Félicité Bana Owona, Centre Pasteur du Cameroun, Yaoundé

Mr Jude Alexis Bondi, Mycobacteriology Department, Centre Pasteur du Cameroun, Yaoundé

Dr Valérie Flore Donkeng Donfack, National Reference Laboratory for Tuberculosis and Buruli ulcer, Centre Pasteur du Cameroun, Yaoundé

Dr Sara Eyangoh, Buruli Ulcer Laboratory Network Coordinator, Centre Pasteur du Cameroun, Yaoundé

Mr Yannick Willy Kamdem Simo, Mycobacteriology Department, Centre Pasteur du Cameroun, Yaoundé

Mr Hycenth Numfor, Buruli Ulcer Laboratory Network, Centre Pasteur du Cameroun, Yaoundé

Dr Serges Tchatchouang, Centre Pasteur du Cameroun, Yaoundé

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Other skin NTD experts

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Online participant

The following participants (listed alphabetically by surname) also joined the meeting online.

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Gabriella Acquah
Ernesto Afonso
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Jennifer Seyram Amedior
Aby Christiane Amon
Margaret Anima Annang
Edwin Ampadu
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Gisela Bretzel
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Malkin Saar
Emma Sáez López
Raoul Saizonou
Sammy Sam-Wobo
Michael Sandel
Shirley Simpson
Igor Tebekem
Tamaz Tsulaia
Stefanie Weiland
Henri Yendjo

BU-LABNET membership certificate

World Health Organization

CERTIFICATE

OF MEMBERSHIP

THIS IS TO CERTIFY THAT

Laboratory/Institution/Country

is a member of the Buruli ulcer Laboratory Network in Africa (BU-LABNET) and participates in its activities including the External Quality Assessment Program

This certificate is valid till December 2024

Dr. Sara Eyangoh
BU-LABNET Coordinator
Centre Pasteur du Cameroun

Dr. Kingsley Asiedu
WHO Global Buruli ulcer Initiative
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Meeting photographs

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Group photo


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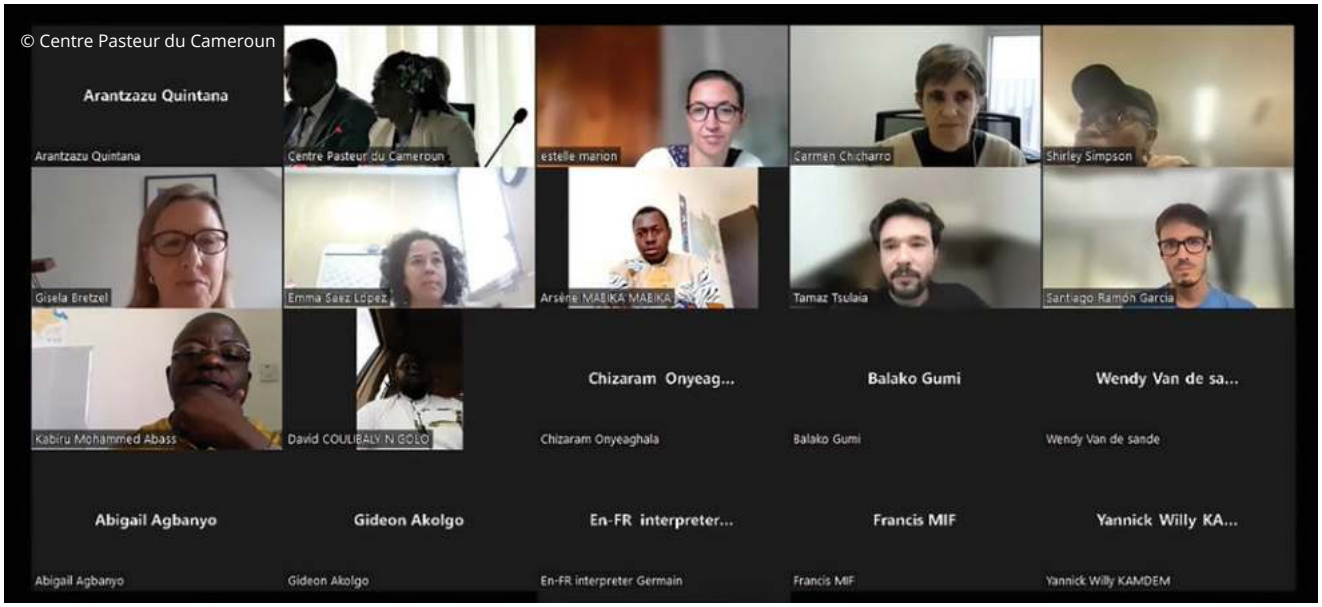
On-site participation



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