





# Capacity building at points of entry during COVID-19 pandemic: harmonising training curriculum for Economic Community of West African States

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## ABSTRACT

This paper describes the process for developing, validating and disseminating through a train-the-trainer (TOT) event a standardised curriculum for public health capacity building for points of entry (POE) staff across the 15-member state Economic Community of West African States (ECOWAS) that reflects both international standards and national guidelines.

A five-phase process was used in developing the curriculum: phase (1) assessment of existing materials developed by the US Centers for Disease Control and Prevention (CDC), Africa CDC and the West African Economic and Monetary Union, (2) design of retained and new, harmonised content, (3) validation by the national leadership to produce final content, (4) implementation of the harmonised curriculum during a regional TOT, and (5) evaluation of the curriculum.

Of the nine modules assessed in English and French, the technical team agreed to retain six harmonised modules providing materials for 10 days of intensive training. Following the TOT, most participants (n=28/30, 93.3%) indicated that the International Health Regulations and emergency management modules were relevant to their work and 96.7% (n=29/30) reported that the training should be cascaded to POE staff in their countries. The ECOWAS harmonised POE curriculum provides a set of training materials and expectations for national port health and POE staff to use across the region. This initiative contributes to reducing the effort required by countries to identify emergency preparedness and response capacity-building tools for border health systems in the Member States in a highly connected region.

## INTRODUCTION

The WHO estimates that 1.3% of the world's health workforce resides in sub-Saharan Africa; however, the continent accounts for 25% of the global disease burden.<sup>1</sup> The health consequences of the global disease burden are

## SUMMARY BOX

- ⇒ Workforce development among Member States' staff supporting points of entry (POE; air, sea and ground crossing) aims to improve public health preparedness and response by enhancing the training, skills and performance of POE health workers.
- ⇒ POE health staff play a crucial role in the provision of emergency response to public health threats and management of ill travelers at the POE.
- ⇒ The harmonised curriculum will assist with standardised capacity-building efforts and help Member States to meet required International Health Regulations core capacities at POE.
- ⇒ This curriculum will offer practice and remediation opportunities on key POE skills that will aid in prompt detection and effective response to any public health threats or events in the region.

often devastating, including high numbers of deaths, injuries, illnesses and disabilities. Such morbidity and mortality interfere with health service delivery through loss of health staff, interruption of health programmes in the Member States and an overburdening of clinical services. The front-line health workforce in this context has a vital role in building the resilience of communities and health systems in the Member States to respond to epidemics and disasters by detecting public health events, improving health service coverage, and contributing to emergency and disaster risk management.<sup>2</sup> Investment in the front-line health workforce, especially the staff at points of entry (POE), helps build health resilience and health security and strengthen capacities to prevent, prepare for, respond to and recover from emergencies.



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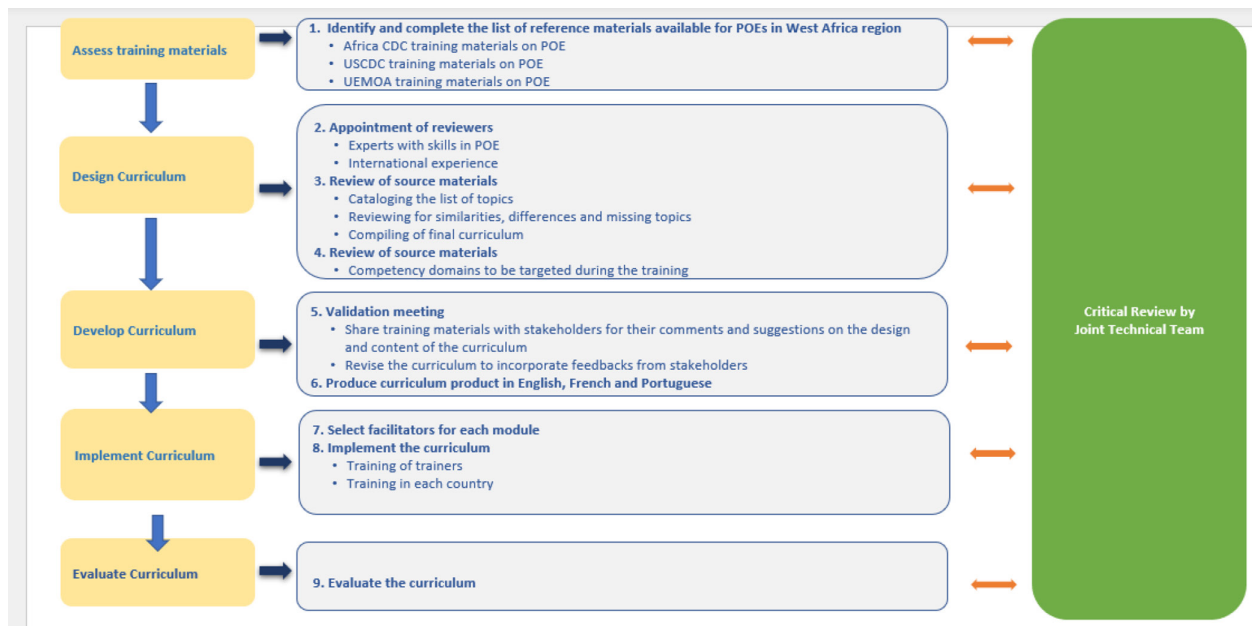
Throughout Africa, POE health staff play a crucial role in the provision of emergency response to public health threats and management of ill travelers at the border. Increasing the number of skilled POE health staff workforce and providing specialty POE health training remains a significant need.<sup>3</sup> In the 15-country Economic Community of West African States (ECOWAS) region, populations are highly connected across borders emphasising the need for a strengthened border health system in the Member States and workforce to contribute to mitigating the international spread of communicable diseases, i.e., Ebola virus disease, Lassa fever, COVID-19.<sup>3</sup> A regional analysis of the POE capacities of the 15 ECOWAS Member States revealed multiple gaps that need to be addressed to improve regional health security, including inadequate training and assignment of qualified personnel for risk assessments of conveyances at official POE.<sup>3</sup> Additionally, the COVID-19 pandemic demonstrated the immediate need to address these gaps in a coordinated approach by leveraging the convening power of the West Africa Health Organisation (WAHO), a specialised health institution of ECOWAS. Given the varying levels of border health capacities in the ECOWAS Member States, the number of official languages across the region, and different stakeholders implementing POE curricula to build POE-level International Health Regulations (IHR) capacities, WAHO identified the need for a harmonised training curriculum for POE staff. Having a regional training curriculum could facilitate a standardised approach to building border health workforce capacity to implement public health measures at POE and respond more efficiently to public health issues.<sup>4</sup> This approach to strengthening POE capacities would not only contribute to improved strategies for

preventing, detecting and responding to public health events at POE but would also contribute to strengthened, effective public health cross-border collaboration and information sharing.

WAHO through the ECOWAS Regional Centre for Surveillance and Disease Control (RCSDC), in collaboration with the African Field Epidemiology Network (AFENET) and the US Centers for Disease Control and Prevention (US CDC), supports a regional initiative to strengthen preparedness and response capacities to public health emergencies including COVID-19, Ebola, and other current and emerging health emergencies in the region. This initiative contributes to the overall ECOWAS vision to create a borderless region where the population has access to its abundant resources under a sustainable environment and to education and health systems in the Member States without the risk of disease spread across borders.<sup>5</sup> We describe the process of developing a harmonised, ECOWAS curriculum for POE staff to meet international standards to mitigate the international spread of disease.

### Harmonisation design

In 2020, WAHO, US CDC border health experts and AFENET constituted a joint technical team ('team') of eight individuals to review existing border health training materials and facilitate a process to create a harmonised curriculum. The team adopted the Assessment, Design, Development, Implementation and Evaluation model (figure 1) to complete the process. More specifically, the team developed a five-phase process to accomplish this goal: (1) assessment of existing materials developed by the US CDC, Africa CDC and the West African Economic and Monetary Union (UEMOA), (2) design of retained and



**Figure 1** Adaptation of ADDIE model for harmonised curriculum for POE staff in ECOWAS region. ADDIE, Assessment, Design, Development, Implementation and Evaluation; CDC, Centers for Disease Control and Prevention; ECOWAS, Economic Community of West African States; POE, points of entry; UEMOA, West African Economic and Monetary Union.

**Table 1** Content and time allocated for facilitating the training for materials in the harmonised POE staff training curriculum

Training module	Content	Time allocated
Module 1: IHR Core Capacity requirements for POE	<ul style="list-style-type: none"> <li>▶ The International Health Regulations and Emergency Management</li> <li>▶ Implementing IHR and POE Global Guidance at your POE: Group Activity</li> <li>▶ Review of IHR preparedness</li> <li>▶ PPE at POE: Types of PPE and Considerations</li> <li>▶ PPE at POE: Donning and Doffing PPE</li> </ul>	10 hours
Module 2: Means of surveillance at POE	<ul style="list-style-type: none"> <li>▶ Temperature Screening and Considerations for Thermometers</li> <li>▶ Conducting an Ill Traveller Risk Assessment-part I</li> <li>▶ Conducting an Ill Traveller Risk Assessment-part I</li> <li>▶ Risk Assessments: Group Activity and Closing</li> </ul>	10 hours
Module 3: Considerations for different types of POE	<ul style="list-style-type: none"> <li>▶ Considerations for Ports</li> <li>▶ Considerations for Airports</li> <li>▶ Considerations for Ground Crossings</li> <li>▶ POE-Specific Considerations: Group Activity and Closing</li> </ul>	2 hours
Module 4: Public health standard operating procedures at POE	<ul style="list-style-type: none"> <li>▶ Public Health Standard Operating Procedures at POE, Part I</li> <li>▶ Public Health Standard Operating Procedures at POE, Part 2</li> <li>▶ Forming a core planning team at a POE</li> <li>▶ Developing SOPs and Core Planning Team Member States: Group Activity and Closing</li> </ul>	6 hours
Module 5: Planning for sustained emergencies	<ul style="list-style-type: none"> <li>▶ Planning for Sustained Emergencies, part I</li> <li>▶ Planning for Sustained Emergencies, part II</li> <li>▶ Sustained Emergencies and Contingency Planning: Group Activity and Closing</li> </ul>	5 hours
Module 6: Non-health training	<ul style="list-style-type: none"> <li>▶ Adult Learning Principles</li> <li>▶ Adult Learning Principles and Training Non-Health Audiences: Group Activity and Closing</li> </ul>	5 hours

IHR, International Health Regulations; POE, points of entry; PPE, Personal Protective Equipment.

new, harmonised content, (3) validation by the national leadership to produce final content, (4) implementation of the harmonised curriculum during a regional train-the-trainer (TOT) and (5) evaluation of the curriculum. The team made systematic decisions about the target audience (learner characteristics), intended outcomes and objectives, and curriculum content, quality, methodology and evaluation strategies.

#### Phase 1: assessment of existing materials

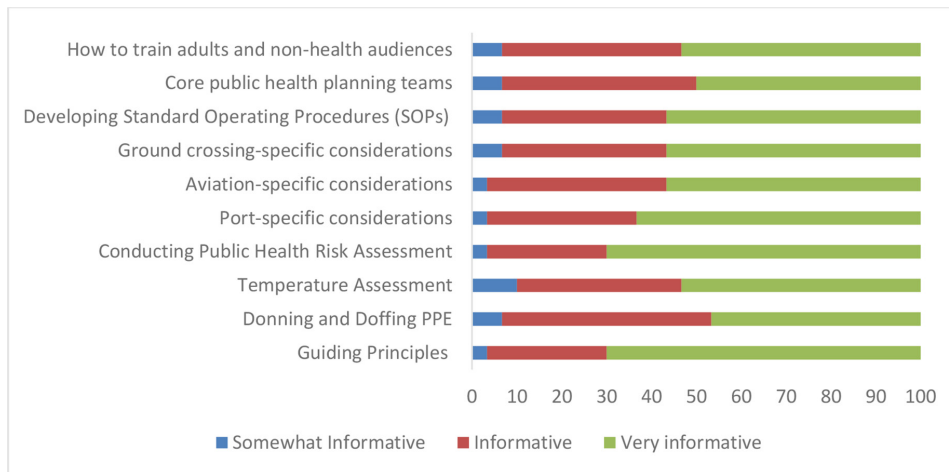
The team collated materials from three sets of existing training materials provided by the partners to identify the list of competency domains against which the training needs of the POE health staff could be assessed. The first was from Africa CDC's 3-day training workshop package for POE staff, in English, which includes modules on surveillance at POE, global guidance for public health at POE, and the Integrated Disease Surveillance and Response framework. The second set of reference materials, from the West African Monetary Union (UEMOA), included eight modules in French covering various aspects of POE public health activities including regulations and operations at POE, surveillance at POE, and infection, prevention and control measures. The final set of reference materials, in English, were from a 2-week training course developed by the US CDC that covered topics like those covered by Africa CDC and UEMOA

and had modules on best practices for training adults to enhance the cascade process.

The team invited four individuals from the ECOWAS region with training or curriculum development expertise to participate in the process as curriculum reviewers. These reviewers are well versed in border health concepts, experienced in developing reports and reviewing guidance and training materials for international audiences, and had attention to detail. The reviewers included individuals who were native French or English speakers who could review the materials in the original language.

#### Phase 2: designing the harmonised curriculum

During this phase, the expanded team catalogued the list of topics in existing materials. The technical team developed a standard tool for each reviewer to use when reviewing existing modules and cataloguing all topics covered. Each reviewer used the tool to provide a brief overall description of the materials they were assigned to review along with details from each covered topic including the primary objective, a summary of the main points and a critical review of the clarity, completeness and relevance for covering that topic. The team and reviewers used the tool to document the relevant page number(s) or section(s) that covered border health topics, the number of pages or slides on the topics and the approximate time required to cover the identified



**Figure 2** National leadership responses to how informative is each module in the harmonized curriculum (n=30 respondents). PPE, Personal Protective Equipment.

material. The reviewers reviewed materials from one of the three sources simultaneously before moving to materials from another. The technical team supported the reviewers by maintaining biweekly calls to discuss progress and any challenges that might have arisen from the review process.

After completing a review of all topics across the three sets of materials, the expanded team grouped similar topics across all materials and assigned a set of topics to each reviewer for an intensive review of similarities and differences across materials from all three sources. The team developed a spreadsheet to compile all comments from the English and French versions of the reviewed training materials. The team also suggested additional topics needed in the context of COVID-19 and addressed the gaps identified in the existing materials. The team used results from phase 2 to identify and agree on which components of the existing materials to retain and which to adapt for the harmonised curriculum and the content and format to be used.

### Phase 3: validating the final curriculum

After the team had the harmonised POE curriculum translated into French, they shared the materials with all Member States and border health partners. The team organised a stakeholder’s in-person meeting in June 2021 in Abidjan, Côte d’Ivoire to review and validate the curriculum and to ensure buy-in and utilisation by all Member States. The objectives of the meeting were to present the harmonised curriculum materials to Member States and POE stakeholders who are POE staff or border health experts in the fifteen Member States and development partners. The partners who participated in the meeting included WAHO, US CDC, AFENET, International Organization for Migration, UNEMOA, Pro-Health International, Regional Animal Health Centre, ECOWAS Department of Free Movement, Mano River Union and the Abidjan Lagos Corridor Organization. Also, represented virtually in the meeting were representatives from FHI360, German Agency for International Cooperation,

and Johns Hopkins Programme for International Education in Gynecology and Obstetrics to receive feedback and input, and to finalise and validate the curriculum modules. The workshop-based review process was divided into primary and secondary review phases, with participants assigned to one of four groups based on their country’s official language or their native language. The team provided the participants with the modules, rubrics, and review asset charts. The review assets chart had the training module title, a brief description of the material reviewed and identified gaps, recommendations, and suggestions while the rubrics had four criteria (content, structure, cohesion and learner’s support) scored on a scale of 1–4. For the primary review during the workshop, each group appointed a leader to facilitate the group’s discussion. The team asked group members to write down any significant observations on the strengths and gaps of the training module, which were all formatted as electronic presentation slides. For observations on specific slides, reviewers were asked to include the slide number. Following the discussion, each group recorded the agreed on strengths and gaps in the review assets chart and the grades in the module rubrics.

The secondary review provided the opportunity to check over and potentially further validate the primary reviewers’ impression of the module. During the secondary review, each group assessed another group’s review of a module other than one the group reviewed during the primary phase in English and French Languages.

The team presented the review reports during the plenary sessions for further discussion. Partners also reviewed the documents and provided feedback both in person and virtually. The team and participants deliberated until agreement any modifications for further action.

After reviewing the feedback from Member States’ participants and partners, the Member States’ representatives unanimously validated the curriculum and adopted

**Table 2** Characteristics of training of trainer participants and overall perspectives on the harmonised curriculum (n=30)

Variable	Frequency (%)
Sex	
Male	26 (86.7)*
Female	4 (13.3)
Experience working at or in support of points of entry (POE) (years)	
0–5	12 (40.0)
6–10	15 (50.0)
>10	3 (10.0)
Organisation the participant represented	
Ministry of Health	17 (56.7)
National Public Health Institute	7 (23.3)
Other	6 (20.0)
Which modules do you find most relevant to your work* (Yes)	
Module 1: IHR and emergency management	28 (93.3)
Module 2: measures of surveillance at POEs	24 (80.)
Module 3: considerations for POEs	26 (86.7)
Module 4: public health standard operating procedures for POEs	24 (80.0)
Module 5: planning for sustained emergencies	21 (70.0)
Module 6: adult learning and training of non-health staff	19 (63.3)
Which modules do you think you need to cascade to your POE† (Yes)	
Module 1: IHR and emergency management	25 (83.3)
Module 2: measures of surveillance at POEs	29 (96.7)
Module 3: considerations for POEs	26 (86.7)
Module 4: public health standard operating procedures for POEs	20 (66.7)
Module 5: planning for sustained emergencies	19 (63.3)
Module 6: adult learning and training of non-health staff	15 (50.0)
Length of the workshop	
Just right	24 (80)
Too long	4 (13.3)
Too short	2 (6.7)
*n (% of 30).	
†Multiple responses allowed.	
IHR, International Health Regulations; PPE, Personal Protective Equipment.	

it as a tool to enhance to enhance POE staff capacity across the region. Member States also agreed to have regional master trainers who would support their respective states to cascade the training. The broad group also agreed that Member States can adopt the entire training curriculum or specific modules to align with their national priorities.

#### Phase 4: implementing the curriculum

WAHO through the RCSDC led a 10-day TOT for a class of 30 POE system representatives and staff from 15 ECOWAS Member States and additional development

partners to test the validated and translated (English, French and Portuguese) harmonised curriculum. The meeting was organised in Niamey, Niger with the financial support of the Capacity Strengthening Project funded by the US Agency for International Development and the Regional Disease Surveillance Enhancement Project funded by the World Bank. The TOT workshop consisted of teaching sessions on each module, plenary discussions, group work and practical demonstrations facilitated by POE experts. Member States shared best practices for responding to public health emergencies at POE. At the end of the TOT, each Member State developed a cascade plan for training in their respective countries. The training cascade plan included the identification of the training target audience, an implementation timeline, selected module(s) based on country priorities and training methods.

#### Phase 5: evaluating the curriculum

The team completed the evaluation of the training using the first two levels of Kirkpatrick's four levels of training evaluation<sup>6</sup>; 'reaction' to the learning content and environment and 'learning' (or acquisition of new knowledge) were both assessed after the delivery of each module using an evaluation form. Team members completed this evaluation at the TOT by monitoring the curriculum delivery and documenting trainers' and trainees' interaction, the content of the training materials and the mode of delivery of each module.

#### Findings from phase 1 to the review of existing materials

The team made observations and identified gaps when synthesising the materials from the three reference sources during phase 1.

#### Observations

- The reference materials focused on the functions performed at various types of POE.
- The materials discussed how to perform various functions as related to the IHR core capacities and other POE regulatory agencies like the International Maritime Organisation (IMO) and the International Civil Aviation Organisation (ICAO).
- Materials discussed how to improve cross-border information sharing especially at the ground crossing during regional outbreaks or pandemics.
- There were a few very good videos that illustrated the concepts clearly.

#### Gaps identified

- Some of the information in the reference materials were outdated.
- There were insufficient training materials on how to enhance surveillance at POE. For example, the material on temperature screening and considerations for thermometers presented basic information on the reasons for temperature monitoring at POE. Additional information is needed including guidance on the different types of thermometers, contact

and non-contact thermometers and their merits and demerits, the acceptable temperature cut-off, and the procedure for taking optimum readings with the non-contact thermometers.

- iii. There is no clear framework for conducting cross-border meetings.
- iv. The materials did not explain in detail what to do differently during a public health emergency of international concern vs regional or local outbreaks affecting POE.
- v. The material presented an overview of a core planning team, its composition and key tasks that may be carried out. It did not provide the participants with the procedure and guidance on how best to achieve the goal of planning for the larger organisation.
- vi. The videos and infographics could be updated to include more recent events like Ebola in West Africa and COVID-19 to help drive the need home for the targeted audience.

### Completing phases 2 and 3 to develop the harmonised curriculum

The team identified six modules from a total of nine modules to retain in the harmonised curriculum. They based this decision on an agreement that training for POE staff generally needs to cover capacities to prevent, detect, respond to and manage ill travellers. The harmonised curriculum has six modules to address IHR core capacity requirements for POE, surveillance at POE, public health standard operating procedures at POE, considerations for adapting relevant strategies to different types of POE, planning for sustained emergencies and providing training to non-health POE staff (table 1). The harmonised curriculum incorporates thematic presentation slides, job aids, facilitator guides, group activities, scenarios and grading rubrics. The curriculum is built following a TOT model, with the intent that those trained will cascade the training they received to other POE personnel.

### Results from phases 4 and 5 to implement and evaluate the harmonised curriculum

Most of the 30 Member States' representatives in the TOT were male and half of them had 6–10 years of experience working at POE (table 2). Almost all the participants (93.3%) found module 1 on the IHR and emergency management relevant to their work. Nearly all (96.7%) thought they needed to cascade module 2: Measures of surveillance at POEs in their respective countries. Seventy percent of the participants found modules on guiding principles (IHR and emergency management, ICAO, maritime regulations) and conducting public health risk assessments very informative. Participants found the harmonised curriculum informative or very informative for POE staff in their respective Member States (figure 2). The TOT participants developed cascade plans to adapt the materials and provide the training to POE staff in their countries.

### Practice implications

This paper adds to the literature on WAHO and RCSDC initiatives to strengthen emergency response capacities following the COVID-19 outbreak and other emergencies.

The harmonised curriculum marks the beginning of a new journey for strengthening the performance of POE staff across the ECOWAS region. This initiative focused strongly on meeting WHO requirements for developing the core capacities required to implement the IHR and strengthening the competencies of the POE staff who play lead roles in emergency planning and management at POE. The scope of the task and all aspects of the needs assessment and identification of the competencies were developed through iterative inputs from subject matter experts of national public health institutes, port health services, ministries of health and development partners.

The harmonised curriculum developed a new training framework for public health preparedness based on consensus identification of core learning domains and cross-competencies. The competencies can be applied to a wide range of POE staff who are expected to perform at different levels according to experience, professional role, level of education or job function. This approach will lead to a common lexicon and improved standardisation of training programmes for Member States across ECOWAS.

One key outcome of the regional TOT was the establishment of a comprehensive and sustainable model of training. The adaptable and free nature of the didactic materials increases the chance of sustainability. The TOT model is the second example of our drive for sustainability. The ultimate example of the sustainability of this programme is rooted in collaboration. The partners in this programme have been able to ensure the integration of its products into existing training materials with validated support from national leadership across the region. Throughout the process, the team dedicated efforts to address the context of multiple official languages across the Member States and the value of including experts in border health and in training and curriculum development.

An essential component of this initiative was the involvement of country leadership in the process to standardise the curriculum and implement the regional TOT. Recently, two Member States have cascaded the training to their POE staff. Forming collaborative partnerships with institutions in the Global North is part of a growing trend in low-income and middle-income countries (LMICs) where disparities in resources are an issue.<sup>7</sup> Improving the health of people in the ECOWAS region, and across sub-Saharan Africa, through the provision of well-equipped POE is dependent on strengthening POE staff to detect, prevent and respond to infectious diseases, capacities the harmonised curriculum is designed to address.<sup>8</sup> This initiative is part of the effort to streamline capacity building in the region and encourage cross-border communication and collaboration. Training the

entire region's POE staff with one curriculum ensures there have common standards and similar protocols and enhances ease of communication and information sharing. Though there are rooms in the Member States for local adaptation to suit unique country needs, the overall principles and approach are essentially the same. The common curriculum also helps in resource mobilisation and asset sharing as member countries can draw personnel from other members states to support their own capacity building where the need arises.

## CONCLUSION

The harmonised curriculum is regionally relevant and will provide materials to support standardised capacity-building efforts, facilitate cross-border collaboration and help Member States to meet required core capacities at POE. The harmonised curriculum also offers practice and remediation opportunities on key POE skills (risk assessment, Personal Protective Equipment (PPE) donning and doffing, temperature-taking, etc) that will aid in the prompt detection and effective response to any public health threats or events. In this harmonised POE curriculum, we adopted an approach for TOT, which offers a dynamic opportunity for the acquisition and sharing of knowledge to lower levels. Using such a model to effectively train participants from various LMICs shows the opportunities this training curriculum offers as a capacity-building tool.

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## REFERENCES

- 1 World Health Organization. The 2021 update, global health workforce statistics. Geneva; 2021. <https://www.who.int/data/gho/data/themes/topics/health-workforce> [Accessed 28 May 2021].
- 2 World Health Organization. Global strategy on human resources for health: 2016 workforce who document production services, ISBN 978 92 4 151113 1. Geneva, Switzerland; 2030.
- 3 Lokossou VK, Usman AB, Sombie I, *et al*. COVID-19 pandemic in economic community of West African states (ECOWAS) region: implication for capacity strengthening at point of entry. *Pan Afr Med J* 2021;39:67.
- 4 World Health Organization. International health regulations (2005) -- 3rded, WHO library Cataloguing-in-Publication data, 2016. Available: <https://www.who.int/publications/i/item/9789241580496>
- 5 Economic community of West African states (ECOWAS) basic information. Available: <https://ecowas.int/about-ecowas/basic-information/> [Accessed 18 Jan 2022].
- 6 Kirkpatrick JD, Kirkpatrick WK. *Kirkpatrick's four levels of training evaluation*. Kindle, 2016.
- 7 Kolars JC, Cahill K, Donkor P, *et al*. Perspective: partnering for medical education in sub-Saharan Africa: seeking the evidence for effective collaborations. *Acad Med* 2012;87:216–20.
- 8 Economic Community of West African States (ECOWAS). Regional strategic plan for preparedness and response to epidemic 2020. Available: <https://www.wahooas.org/web00as/sites/default/files/publications/1084/versionanglaisecorrige.pdf> [Accessed 22 July 2021].