ASSESSMENT OF CORE CAPACITY FOR ADDRESSING PUBLIC HEALTH EMERGENCIES OF INTERNATIONAL CONCERN AT THE DESIGNATED POINT OF ENTRY IN SOUTH WEST, NIGERIA

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Abstract

Points of Entry (POEs) are at the frontline for prevention, detection and response to international spread of diseases. The objective of this study was to assess core capacity for addressing PHEICs at the designated point of entry in South West, Nigeria. Data were collected from February to April 2025 in 2 designated POEs: Seme Krake ground crossing border, Idi-Iroko ground crossing border.The world health organization(WHO)assessment guide tool for core capacity requirement for ground crossings was used to collect data and total 385 semi-structure questionnaire was administered for this research using random sampling technique and analyzed using a descriptive statistics and Chi-square tests, on three technical capacities:(i) Core capacity for communication and coordination(ii)Core Capacities at all times (iii) Core capacities to response to emergency and Seme Krake recorded the highest percentage for all groups of capacities, coordination and communication, core capacity at all times and core capacity for emergency response with a percentage of 60%, 40% and 30% and Idi-Iroko recorded 40%,30%,20% respectively. A significant associations between formal structures with a separate port health unit have a significant association with emergency response across the two POEs: (p=0.001).This shows that adequate infrastructure play vital role in responding against PHEICs.

Keywords: Public Health Emergency of International Concern, Points of entry, Ground Crossing border, Core capacity, Nigeria

Introduction

The International Health Regulations (IHR) (2005) require states parties to develop, strengthen and maintain national capacities necessary for the surveillance, verification and response to potential health threats and to apply these at their designated points of entry. This legal instrument contains rights and obligations for countries concerning prevention, surveillance and response to health measures applied to international travelers at the point of entry (POEs). Surveillance and response to health measures applied to international travelers at the point of entry (POEs). International airports, ports and ground crossings are required to have health units for undertaking public health measures during routine time and specific measures during the time of public health emergency of international concern (WHO, 2005)

In recent years, there has been an increase in the frequency of outbreaks, epidemics, and pandemics globally. This has been attributed to an increase in human mobility, particularly in international travel, that has facilitated the global spread of disease (Baker et al., 2022). Previous epidemics, such as the 2014–2016 West Africa Ebola epidemic and more recently the monkey pox and COVID-19 pandemics, have demonstrated the importance of having the capacity to detect and respond to disease at Points of Entry (POE).

Findings by Wanyanaet al., (2024) in all assessed 53 gazette POEs in Uganda (4 airports, 16 inland ports, and 33 ground crossings). Most (94%) reported communication capacities with national and sub-health authorities with 88% completeness of reporting. Forty-two per cent provided access to appropriate medical services for assessment and care of ill travelers, 42% had access to sanitary facilities, 21% had access to safe water, and 23% had appropriate waste management and vector control. Regarding the capacity to respond to PHEs, all designated POEs had a public health emergency contingency plan,74% provided screening of all travelers but screened 56% of the travelers, 38% had the capacity to quarantine and isolate suspected human cases, and 15% had the capacity to transport suspected cases to referral health facilities. Twenty three percent of the suspected ill travelers were isolated, investigated and referred for further care if necessary. Only 8% assessed animals being transported through POEs for priority animal trans-boundary diseases

Some serious public health events that endanger international public health may be determined under the International Health Regulations to be public health emergencies of international concern (PHEIC). The term public health emergency of international. Concern is in the IHR (2005) as "an extraordinary event which is determined as provided in these Regulations: IHR constitute a public health risk to other States through the international spread of disease and potentially require a coordinated international response. This implies a situation that is serious, unusual or unexpected; carries implications for public health beyond the affected State's national border; and may require immediate international action.

Research Questions

To guide this investigation the following questions were asked

1. Volume of travelers received per day received at the point of entry
2. Are there formal protocols for communication with international health organizations (e.g., WHO) during PHEICs
3. Does the Point of Entry have adequate infrastructure and resources (e.g., medical equipment, diagnostic tools, PPEs,) to respond to public health emergencies

Research Hypothesis

H0: There is a no significant positive relationship between characteristics of point of entry and emergency response against public health emergency of international concern

H1: There is significant relationship between characteristics of point of entry and emergency response against public health emergency of international concern

Methodology

A descriptive cross-sectional survey design was adopted using a mixed-methods approach. The quantitative component was employed using a structured questionnaire to assess core capacity for addressing public health emergencies of international concern at the designated point of entry, while focus group discussion (FGDs) was used for qualitative component using WHO-IHR assessment guide tool to gain deeper insights into personnel, barriers, and enabling factors influencing core capacity for addressing public health emergencies. Mixed-methods are particularly appropriate as they combine numerical data with contextual explanations, thereby increasing the validity of findings (Creswell & Plano-Clark, 2018). Data were collected for 3 days during a period of April to May 2025. At the (2) POEs land border crossings officially recognized by the Government of Nigeria (Seme border and Idi-iroko border) was selected and enrolled in the assessment.

Inclusion Criteria:

1. All personnel that have access to passenger/Cargo at the designated point of entry in South West, Nigeria

2. All personnel with (5) years services and above as at the time of data collection
3. Willing to give informed consent

Exclusion Criteria:

1. All personnel that does not have access to passenger/cargos at the designated point of entry in South West, Nigeria
2. Administrative staff without access to passenger
3. All personnel absent or leave as at the time of data collection

Validity Test

To ensure validity, the questionnaire was reviewed and vetted by experts, including the research supervisor, prior to administration. Feedback from this process was used to refine and correct the instrument to improve clarity and relevance. The final version of the questionnaire was designed to capture opinions and behaviors directly related to the study objectives, thereby enhancing its construct validity.

A probability random sampling techniques was employed to ensure that the data collected is representative of all personnel working at the POEs that have access to travelers. The target population was divided into different strata based on variables such as profession, Rank and year in services.

The data were gathered through a structured survey conducted among POEs staff within at the designated point of entry Seme border and Idi-iroko border in South West, Nigeria. This survey included closed-ended questionnaires designed to collect essential information, such as:

Instrument for Data Collection

a. Quantitative Data: Structured Questionnaire

The instrument for data collection used was a structured self-administered questionnaire. The questionnaire was designed in line with the study objectives and divided into five sections: Section A: Socio-demographic information (name of POEs, type of POEs, cadre, years of services, etc.)

Section B: Characteristics of point of entry (structural facilities, type of infrastructure, Volume of travelers)

Section C: Coordination and communication against PHEICs (protocols for communication, mechanisms in place to report, risk assessment, written plan)

The questionnaire items are developed from previous validated assessment of core capacity for addressing public health emergencies of international concern at the designated point of entry studies (Singh et al.,2020; Wanyana et al., 2024; Fossouo et al., (2020),) and aligned with the WHO-IHR tool guide.

b. Qualitative Data: Focus Group Discussion (FGD)

The one-on-one conversation with key information within the selected strata, adopting open-ended questions using WHO-IHR guide.

The FGD will explore:

Activities of the POEs

Status of the POEs in implementing WHO-IHR guide (Partial, Full, None)

Observation of the POEs

Suggestions for improving the POEs

The researcher and trained research assistants administered. Respondents completed the forms anonymously and return them immediately to reduce non-response bias. For FGDs, interviews were conducted in English and informed consent was seek.

Quantitative Data: Data was entered into SPSS (version 25). Descriptive statistics (frequencies, percentages) was summarized variables. Inferential statistics (Chi-square tests) was examining

associations between characteristics of POEs and Emergency response in IHR and the relationship between factors influencing core capacity and responding emergency as well. Significance was set at $p < 0.05$.

Qualitative Data: An Excel Spreadsheet File Model analysis was used in a Microsoft Excel file format, and is run using only calculations (no macros).

Results and Discussion

Demographic information of Respondents at the Seme-krake and Idi-Iroko ground Crossing

Table 1 presents the result for socio-demographic characteristics of the study participants at Seme border Idi-Iroko border. The findings reveal that majority (52.2%) of responses are port health, Immigration (28.2%),Quarantine Officer (5.1%), Custom (6.2%), NDLEA (4.9%), while others (3.4%) of the respondents. Findings also revealed that the majority of the respondent's year in service range between 6-10 (57.3%), 1years (3.4%),1-5(4.9%),11-15(28.3%), while 25years and above (28.2%). Findings also revealed that majority of the respondents professional grade level ranges between 6-10 (54.8%),1-5 (3.1%),11-15(28.3%) and while 15 and above (13.7%) respondent.

Table 1: Demographic information of the Respondents at the Seme-krake and Idi-Iroko ground Crossing (n=385)

Variable	Sub Variable	Frequency	Percentage %)
Name of the Point of Entry	Seme-Krake Ground Crossing	236	61.2
	Idi-Iroko Ground Crossing	149	38.8
	Total	385	100
Profession/Cadre of Respondents	Port Health Officer	201	52.2
	Immigration	109	28.2
	Quarantine Officer	20	5.1
	Custom Officer	24	6.2
	NDLEA	19	4.9
	Others	12	3.4
	Total	385	100
Year in Service	1-5 years	29	8.3
	6-10 years	221	57.3
	11-15 years	109	28.2
	15 and above	24	6.2
	Total	385	100
Professional Level (GL)	1-5	52	13.6
	6-10	211	54.8
	11-15	109	28.3
	15 and above	13	3.3

Results for Coordination and Communication Achieved at the at Seme-Krake and Idi-Iroko ground Crossing.

Table 2 presents result for Seme-Krake border which is 60% and 40% achieved in Idi-Iroko border, which indicate a significance improvement is needed in relation to the coordination, communication of event information according to WHO-IHR rating assessment and adoption measures, which is the international communication link with the competent authorities at other POE regarding strengthening of the bilateral sharing of public health information with the neighboring country for better coordination is required. This findings corroborates with what was reported by Wanyana et al.,(2022), Ndoungué et al.,(2022) but was different from what was reported by Singh et al., (2020).

Table.2: Coordination and Communication to PHEIC in Seme and Idi-Iroko Ground Crossing

All group of Core Capacity	Seme-Krake Ground Crossing (%)	Idi-Iroko Ground Crossing (%)	WHO-IHR Recommendation (%)
(A)Coordination and Communication Achieved			
International communication link with competent authorities at other points of entry	100	50	100
National communication link between competent authorities at points of entry	50	50	100
Direct operational link with other senior health official	100	100	100
Communication link with travelers for health-related information	50	0	100
Procedures and legal and administrative provisions to conduct inspections and receive reports of cases of illness and	0	0	100
Average Score	60	40	

Results for Core Capacity at all times Achieved for PHEIC in Seme and Idi-Iroko Ground Crossing

Table 3 presents result for Seme-Krake border which is 40% and 30% achieved for Idi-Iroko border, which indicate a required a significant improvement needed in relation to the Core Capacity at all times according to WHO-IHR rating assessment .It is found that there are no facilities for Quarantine/isolation of suspected travelers due no provision for adequate isolation. There are no adequate measures to disinsect, derat, disinfect, decontaminate, or otherwise treat baggage, cargo, containers, conveyances, goods, or postal parcels at the POEs. This findings does not corroborate what was reported by Wanyana et al.,(2022), Ndoungué et al.,(2022).

Table 3: Core Capacity at all times for PHEIC in Seme and Idi-Iroko Ground Crossing

All group of Core Capacity	Seme-Krake Ground Crossing (%)	Idi-Iroko Ground Crossing (%)	WHO-IHR Recommendation (%)
(B) Core Capacity at all times (Routine) Achieved			
Assessment and care of ill travelers	100	50	100
Adequate staff, equipment and premises	50	50	100
Personal protective equipment (PPE) for interviewing ill travelers	50	50	100
Provide access to equipment and personnel for the transport of ill travelers to an appropriate medical facility	0	0	100
Access to personal protective equipment (PPE) for transport staff	0	0	100

Average Score	40	30

Results for Core Capacity for responding to PHEIC in Seme and Idi-Iroko Ground Crossing

Table 4 presents result for Seme-Krake border which is 30% and 20% achieved in Idi-Iroko border, which indicate a required a significant improvement needed in relation to the Core capacities for responding to PHEICs according to WHO-IHR rating assessment, It is found that there is no assessment/care for affected travelers/ animals suspected. There are adequately trained personnel but without wearing PPEs at the POEs. This findings is not similar to what was reported by Wanyana et al.,(2022), Ndoungué et al.,(2022) but Singh et al., (2020) reported as what was different in term of coordination and communication.

Table 4: Core Capacity for respond to PHEIC in Seme and Idi-Iroko Ground Crossing

All group of Core Capacity	**Seme-Krake Ground Crossing (%)**	**Idi-Iroko Ground Crossing (%)**	**WHO-IHR Recommendation (%)**
(C) Core capacity for Emergency response to PHEICs Achieved			
Public health emergency contingency plan	50	50	100
Integration with other response plans	50	50	100
Training and/or drill exercises			
Assessment of, and care for, affected travellers or animals	0	0	100
To apply recommended measures to disinsect, derat, disinfect, decontaminate, or otherwise treat baggage, cargo, containers, conveyances, goods, or postal parcels	0	0	100
Average Score	30	20	

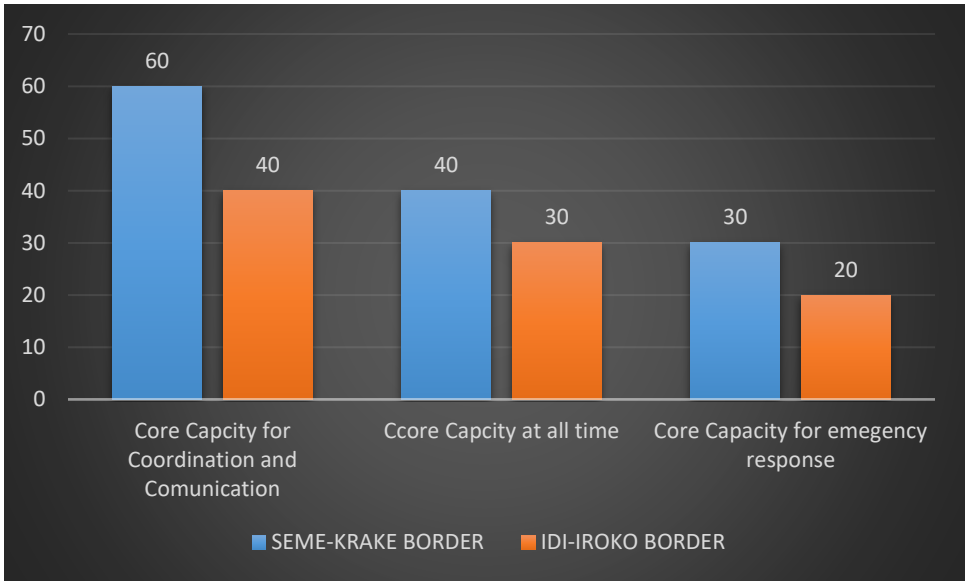

Figure 1: Overall average scored achieved for all capcity at the POEs in South West, Nigeri

Association between Characteristics Point of Entry and Emergency Response to PHEICs

Table 5 presents the chi-square test results examining the association between Characteristics Point of Entry and Emergency Response to PHEICs. The result revealed that formal structures with a separate port health unit have a significant association with emergency response ($\chi^2 = 4.067$, df = 1, p = 0.001), indicating that formal structures play a significant role in emergency response at POEs. Since this p-value is less than the conventional 0.05 level of significance and the null hypothesis (H_{01}) were therefore rejected, it suggests that availability of formal structures with a separate port health unit plays a meaningful role in influencing emergency response among the POEs respondents. This may be attributed to adequate funding for structural development and it will enhance efficiency in combatingformal public health emergency at the POEs This finding was not reported by Wanyana et al.,(2022), Ndoungué et al.,(2022) and Singh et al., (2020).

.In contrast, The result reveal no statistically significant association between volume of travelers received per day at the point of entry with emergency response ($\chi^2 = 1.852$, df = 1, p = 0.174).This finding implies volume of travelers received per day at POEs in South West does not affect emergency response. This finding was not reported by Wanyana et al.,(2022), Ndoungué et al.,(2022) and Singh et al., (2020).

Table 5: Chi square test of association between Characteristics of Point of Entry and Emergency response against PHEICs

Variable	Sub variable	Outcome variable	Frequency	Percentage (%)	Chi-Square	Df	Asymp. Sig. (2-sided)
Are there structural facilities in line with international health regulation	Informal structures with a separate port health unit	Emergency response	17	4.4	4.067	1	0.001
	Formal structures with a separate port health unit		368	95.6			
Volume of travelers received per day received at the point of entry	High (Above 500)	Emergency response	236	61.3	1.852	1	0.174
	Medium (50-500)		149	38.7			

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Conclusion

In conclusion, this study has revealed that there is need for overall significant improvement needed as the POEs scored below 50% (WHO-IHR Annex 1A) in South, Nigeria and there is need to develop and sustain core (IHR, 2005) capacities at POEs. Absence of ambulance services for emergency has been highlighted as a weakness across the POEs. In addition, there no provision for isolation/quarantine of suspected travelers and strengthen the system for the transfer of travelers to designated facilities for appropriate management. There is need for strengthening coordination and communications as a strong link have been identified between this capacity at all time and capacity to

respond to PHEICs,this studied can serve as a baseline for IHR capacity assessment at major designated POEs in another region in Nigeria.

Recommendations

Significant improvement needed in the implementation of WHO-IHR framework and the importance of implementing it to achieve the agenda of global health security.

Awareness and training on the WHO-IHR (2005) should be done tirelessly to create a safety net in the face of the constantly changing health personnel and the high staff turnover.

Ensure adequate funding and targeted budgeting is allocated for all the areas of WHO-IHR (2005). The funds must trickle down to the level of activities and guarantee that awareness materials are not only developed but also disseminated effectively.

Provision of ambulance vehicle at the POEs for transporting suspected cases to the clinics for treatment

Regular provision of adequate personal protective equipment for personnel to enhanced emergency response

References

Asariotis, Regina; Benamara, Hassiba; Mohos-Naray, Viktoria (December 2017). Port Industry Survey on Climate Change Impacts and Adaptation (PDF) (Report). UN Conference on Trade and Development. Archived (PDF) from the original on 2020-11-25.

Bakari E, Frumence G. Challenges to the implementation of International Health Regulations (2005) on preventing infectious diseases: experiencefrom Julius Nyerere International Airport, Tanzania. Glob Health Action.2013;16(6):20942.

Baker RE, Mahmud AS, Miller IF, Rajeev M, Rasambainarivo F, Rice BL, et al. Infectious disease in an era of global change. Nat Rev Microbiol.2022;20(4):193–205. https:// doi. org/ 10. 1038/ s41579- 021-00639-z.

Cummings MJ, Bakamutumaho B, Yang W, Wamala JF, Kayiwa J, Owor N, et al. Emergence, epidemiology, and transmission dynamics of 2009 pandemic A/H1N1 infuenza in Kampala, Uganda, 2009–2015. Am J Trop Med Hyg. 2018;98(1):203–6

EHO EURO. Minimizing health risks at airports, ports and ground cross- ings. 2021 [cited 2021 Jun 28]; Available from: https://www.who.int/activ ities/minimizing-health-risks-at-airports-ports-and-ground-crossings

Fossouo VN, Mouiche MMM, Tiwoda C, Sadeuh-Mba SA, Wango RK,Njayou AN, et al. Assessing countries capacity for public health emergenciespreparedness and response: the joint external evaluation process inCameroon. Pan Afr Med J [Internet]. 2020 [cited 2021 Jun 23];37. Availablefrom: https:// www. panaf rican-med-journ al. com/ conte nt/ artic le/ 37/ 326/full

Gostin, Lawrence O.; Halabi, Sam F.; Klock, Kevin A. (2021-09-15). "An International Agreement on Pandemic Prevention and Preparedness". JAMA. 326 (13): 1257–1258. doi:10.1001/jama.2021.16104. ISSN 0098-7484. PMID 34524388.

Heymann DL, Chen L, Takemi K, Fidler DP, Tappero JW, Thomas MJ, et al. Global health security: the wider lessons from the west AfriEbola virus disease epidemic. Lancet (London, England). 2015;385(9980):1884–901.

International Health Dte. General of Health Services, MoHFW. Biological. International Health Organization. 2017. https://www.ihrpoe.co.in/pdf/ biological.php. Accessed September 15, 2017.

Joint External Evaluation tool (JEE tool)". World Health Organization. 29 March 2019. Archived from the original on March 11, 2018.

Koons C. Superbug spread reveals thin pipeline of newest antibiotics. Bloomberg Business (New York), Feb 20, 2015

Mangal TD, Aylward RB, Mwanza M, et al. Key issues in the persistence of poliomyelitis in Nigeria: a cases-control study. Lancet Glob Health 2014;2(2):e90-e97

Menon AN, Rosenfeld E, Brush CA. Law and the JEE: lessons for IHR implementation. Health Secur. 2018;16(S1):S-11–7.

Ndoungué, V. F., Ngapagna, A. N., Kouadio, S. A., Djinguebey, R., Gnigninanjouena, O., Eyangoh, S., ... & Njajou, O. (2022). Assessing core capacities for addressing public health emergencies of international concern at designated points of entry in cameroon during the COVID-19 Pandemic. BMC Public Health, 22(1), 2197..

Noman, H., Dureab, F., Ahmed, I., Al Serouri, A., Hussein, T., & Jahn, A. (2021). Mind the gap: an analysis of core capacities of the international health regulations (2005) to respond to outbreaks in Yemen. BMC health services research, 21(1), 477.

Olum R, Bongomin F. Uganda's frst 100 COVID-19 cases: trends and lessons. IJID. 2020. https://doi.org/10.1016/j.ijid.2020.05.073

Organization for Security and Co-operation in Europe (OSCE). Selfassessmenttool for nations to increase preparedness for cross-border implicationsof crises. Vienna, Austria:

Otu A, Ameh S, Osifo-Dawodu E, Alade E, Ekuri S, Idris J. An account of the Ebola virus disease outbreak in Nigeria: implications and lessons learnt. BMC Public Health 2017; 18(1):3.

Singh, R., Sumit, K., & Hossain, S. S. (2020). Core Capacities for Public Health Emergencies of International Concern at Ground Crossings: A Case Study from North India. Disaster Medicine and Public Health Preparedness, 14(2), 214-221.

Wanyana, M. W., King, P., Mayinja, H., Migisha, R., Kadobera, D., Kwesiga, B., ... & Harris, J. R. (2024). Assessment of capacity and performance of points of entry in detection of public health events, reporting and responding to public health emergencies, Uganda, July–September 2022.Discover Health Systems, 3(1), 35.

WHO (World Health Organization). International Health Regulations (2005): assessment tool for core capacity requirements at designatedairports, ports and ground crossings [Internet]. Geneva PP - Geneva: World Health Organization; 2009. https:// apps. who. int/ iris/ handle/10665/ 70839

WHO EURO. 13 countries in the European Region better equipped to assess their public health capacities at airports and ports. 2021 [cited 2021 Jun 28]; Available from: https://www.euro.who.int/en/health-topics/ health-emergencies/international-health-regulations/news/news/2019/ 09/13-countries-in-the-european-region-better-equipped-to-assess- their-public-health-capacities-at-airports-and-ports

WHO EURO. 13 countries in the European Region better equipped toassess their public health capacities at airports and ports. 2021 [cited2021 Jun 28]; Available from: https:// www. euro. who. int/ en/ health-topics/health-emergencies/ international-health-regulations/ news/ news/ 2019/09/ 13-countries-in-the-european-region-better.