ASSESSMENT OF CONSTRAINTS TO THE IMPLEMENTATION OF INTERNATIONAL HEALTH REGULATION AT THE POINT OF ENTRY IN LAGOS NIGERIA

Abstract

The effective implementation of International Health Regulations (IHR) at points of entry is crucial for safeguarding public health and preventing the spread of infectious diseases across borders. However, the process faces significant constraints that hinder its success. This study aims to assess the key constraints impeding the successful implementation of IHR at various points of entry in Lagos, Nigeria, specifically at the Murtala Muhammed International Airport, Seme Land Border, and the Lagos Sea Port. A descriptive correlational research design was employed, utilizing a structured questionnaire administered to customs officials, immigration officers, health professionals, and other relevant stakeholders.The study revealed that factors such as inadequate knowledge among personnel, insufficient resources, and limited interagency collaboration are major barriers to effective IHR implementation. The analysis showed a significant relationship between years of experience and knowledge of IHR implementation, highlighting the importance of continuous training and capacity building. Additionally, challenges related to resource availability, including insufficient equipment, lack of personnel, and inadequate facilities, were found to critically affect the implementation process. Despite the majority of respondents indicating adequate physical facilities, a substantial funding gap was identified, underscoring the need for improved financial support to enhance IHR enforcement.The study recommends that addressing these constraints through targeted interventions, including enhanced training programs, better resource allocation, and stronger interagency coordination, is essential for strengthening health security at points of entry in Lagos. The study emphasizes the critical role of sustained investment in infrastructure, training, and interagency collaboration to achieve the full potential of IHR in protecting public health.

Keywords:Port of entries; International Health Regulation (IHR); Constraint of implementation of IHR; Awareness and Knowledge

Introduction

The International Health Regulations (IHR), adopted by the World Health Organization (WHO) in 2005, represent a global legal framework designed to prevent, detect, and respond to public health risks that have the potential to spread across borders and impact international communities. In an increasingly interconnected world where the movement of people, goods, and animals across countries is rapid and widespread, the need for a comprehensive and standardized health regulation system is paramount. Points of Entry (PoEs)—airports, seaports, and land border crossings—are central to the implementation of the IHR. They are key for monitoring and mitigating the risk of transboundary health threats such as infectious diseases, chemical hazards, and radiation (Lone & Ahmad, 2017).

The IHR were developed to ensure that every country has the capacity to detect, assess, report, and respond to public health emergencies without unnecessarily interfering with international travel and trade. The regulations aim to create a balance between protecting public health and maintaining the smooth flow of global commerce. However, despite their importance and the critical role they play in protecting global health security, many countries face significant constraints in implementing the IHR effectively at points of entry. These constraints are especially prevalent in low- and middle-income countries (LMICs), where infrastructure, financial resources, technical expertise, and governance issues limit the ability to fully comply with IHR standards (Martini & Checchi, 2019).

The significance of implementing IHR effectively at PoEs was brought into sharper focus by the COVID-19 pandemic, which demonstrated both the strengths and vulnerabilities of national health systems in containing cross-border transmission of infectious diseases. Countries with well-established systems for enforcing IHR at their points of entry were better positioned to detect early cases of the virus and implement measures such as testing, quarantine, and contact tracing to control its spread. Conversely, countries facing constraints in implementing these regulations were slower to respond, contributing to the global dissemination of the virus (Leal Filho et al., 2021).

The IHR serve as a cornerstone in the global effort to enhance public health security, especially in the face of emerging and re-emerging infectious diseases, environmental hazards, and other health emergencies. Originally adopted in 1969 and revised in 2005, the IHR reflect a modern and holistic approach to public health threats, recognizing that no country can adequately protect itself from health risks in isolation. The 2005 revision expanded the scope of the regulations, moving beyond a narrow focus on specific diseases to include all potential public health emergencies of international concern (PHEIC). This broader scope emphasizes the need for countries to develop core capacities to detect, assess, report, and respond to health emergencies

at all levels, with a particular focus on PoEs, which play a pivotal role in the global health landscape (Nuzzo et al., 2019).

PoEs, such as international airports, seaports, and ground crossings, are critical control points for public health surveillance and response. They act as gateways through which infectious diseases, chemical spills, or radiological incidents can cross borders. Given their unique position at the intersection of international travel and trade, PoEs are ideally placed to identify and contain health threats before they spread within or beyond national borders. This role has grown even more vital as globalization has increased the volume of international travel and trade, amplifying the speed and scale at which diseases and other public health risks can be transmitted globally (Wernli et al., 2021).

One of the foremost challenges to IHR implementation at PoEs is the lack of adequate infrastructure. Airports, seaports, and border crossings in many countries, particularly in LMICs, often lack the necessary facilities to conduct thorough health screenings, manage large volumes of travelers, or quarantine individuals suspected of carrying infectious diseases. For instance, some PoEs may not have sufficient isolation facilities to accommodate travelers with suspected illnesses, or the physical space to set up makeshift medical centers in the event of a health emergency. Additionally, poor sanitation and limited access to clean water and electricity, particularly at remote border crossings, can exacerbate the risk of disease transmission at PoEs (Zhou et al., 2020).

In some regions, outdated or insufficient communication systems pose an additional challenge. Health officials at PoEs may lack access to real-time data-sharing platforms, making it difficult to receive timely information about emerging health threats or coordinate with national and international health authorities. These infrastructural limitations are particularly problematic in emergencies, where swift, coordinated action is critical to preventing the spread of diseases or managing other health risks (van Kerkhove et al., 2020).

Even in cases where the necessary infrastructure is available, many countries struggle with a lack of trained personnel capable of enforcing IHR protocols. PoEs require a specialized workforce that includes health professionals skilled in disease surveillance, customs officials trained to recognize public health risks, and other staff capable of coordinating emergency responses. However, in many LMICs, public health workers are in short supply, and those who are available may not have the specific training required to manage health risks at PoEs. This shortage of trained personnel can lead to delays in detecting and responding to health threats, increasing the risk of transboundary disease spread (Gostin et al., 2020).

Moreover, ongoing professional development and training are often insufficient due to financial constraints and competing health priorities. Without continuous training, even those personnel who have received initial education on IHR protocols may not be equipped to handle the

complexities of evolving health emergencies. This lack of preparedness was particularly evident during the COVID-19 pandemic, where overwhelmed staff at PoEs struggled to implement effective disease control measures, such as testing, contact tracing, and quarantine enforcement (Sharma et al., 2021).

The successful implementation of the IHR at PoEs also requires significant financial investment. Countries must allocate funds to build and maintain infrastructure, hire and train personnel, and purchase necessary medical supplies and equipment. However, in many LMICs, public health systems are underfunded, and PoEs are often not prioritized in national health budgets. Financial constraints limit the ability of governments to establish and sustain the core capacities required by the IHR, particularly at points of entry. In some cases, countries rely on external funding from international organizations or donor agencies to develop these capacities, but the sustainability of such initiatives is a concern once external funds are depleted (Erondu et al., 2018).

Additionally, the costs associated with IHR compliance extend beyond the initial establishment of core capacities. Regular maintenance of infrastructure, continuous workforce training, and the procurement of medical supplies are ongoing expenses that many countries find difficult to afford. This issue is compounded by competing health priorities, such as the need to address endemic diseases, maternal and child health, or malnutrition, which often take precedence over investments in health security at PoEs (Heymann et al., 2017).

2. MATERIALS AND METHODS

2.1 Study Area

The study was conducted at three major port of entries in Lagos.The first was Murtala Muhammed International Airport is situated in Ikeja, Lagos State, Nigeria, at coordinates 06°34′38″N 003°19′16″E. It serves as the primary airport for the entire state. The second study area was Seme Land Border, situated at the southwestern edge of Nigeria, with coordinates 6°22′55″N 2°43′20″E. It shares a border with the Republic of Benin, thirty minutes' drive from Badagry on the coastal road between Lagos and Cotonou. Seme is a part of Badagry Division of Lagos State. With the present political division in the state, it is under Badagry -West Local council development area (LCDA). The third study area was the Lagos Port Complex also referred to as Premiere Port (Apapa Quays) is the earliest and largest Port in Nigeria. It is within the coordinates 6°27′N 3°22′E. It is situated in Apapa, Lagos State, the commercial center of

Nigeria. The Port was established in 1913 and construction of the first four deep water berths commenced in 1921. The Apapa Port is well equipped with modern cargo handling equipment and personnel support facilities making her cost effective and customer friendly. It enjoys intermodal connection – Rail, Water and Road. It boasts of four-wheel gate of about 8 meters for oversize cargoes and this has given the Port an edge over others in the handling of oversized cargoes.

2.2 Sample Collection

A purposive sampling technique was used to select study participants who possess firsthand knowledge and experience in the implementation of IHR at Nigerian airports, seaport and land border. The study participants were purposively selected to ensure representation from various stakeholder groups. This includes customs officials, immigration officers, health professionals, and representatives from relevant government bodies responsible for health and security at airports and land border regions of Lagos Nigeria.

2.3 Sample size determination

The minimum sample size was calculated using Fischer's formula for descriptive studies when the popul ation is less than 10,000.

$$N_f = \frac{n}{1 + \frac{n}{N}}$$

Value of n was calculated using the formula

$$n = \frac{z^2 \rho q}{d^2}$$

Where:

- Z is the Z-value (standard deviation) corresponding to the desired confidence level (e.g., 1.96 for

95% confidence).

- p is the estimated proportion of the population with the characteristic of interest= 0.5
- q is 1−p (the proportion without the characteristic).
- d is the margin of error or precision set at 0.062 for this study.

A total sample size of 250 was obtained and used for this study.

2.4 Data Collection Methods

A structured questionnaire was administered to gather quantitative data from a wide range of personnel stationed at airports, seaport and land border, including customs, immigration, and health officials. The questionnaire includes closed-ended questions to assess the perception of constraints, readiness, and challenges in implementing IHR.

2.5 Data Analysis

Data analysis for the study was conducted using both descriptive statistical methods such as tables and charts, and inferential statistical method such as Logistic regression, Chi-Square test and One Sample test. Analysis was done using Statistical Package for Social Science (SPSS) version 22.0 (SPSS 22).

3. RESULTS AND DISCUSSION

Sociodemographic characteristics of the respondents

From the result it was indicated that, the modal age group of the respondents is 36-45 years, constituting 29.5% of the sample population. This age group represents the most experienced and likely the most influential segment of the workforce at points of entry in Lagos, Nigeria. Majority of the respondents were male, with percentages varying across different points of entry: 69.8% at seaports, 41.2% at airports, and 97.6% at land borders. This gender disparity highlights a potential area for policy intervention to encourage more gender diversity in these roles. Table 1 shows the distribution of various Cadreof the respondents, it indicates a multidisciplinary approach to managing health regulations at points of entry. The health officers making up the largest group at 46.5%. Other roles included customs officers (12.0%), immigration officers (9.0%), security officers (15.0%), and quarantine officers (12.0%). Nurses constituted a smaller fraction at 5.5%. The majority of the respondents (75.5%) had a bachelor's degree as their highest level of education. Other educational qualifications included secondary school (2.0%), diploma (13.5%), master's degree (8.0%), and doctorate degree (1.0%). This high level of education among the respondents suggests a well-educated workforce, which is crucial for the effective implementation of health regulations (Hayman *et al*., 2023). Most respondents (44.5%) had 1-3 years of experience in their jobs, while a smaller percentage (3.5%) had more than 10 years of experience. This indicates a relatively young workforce which may face challenges related to experience and expertise in handling complex health regulations.

Table1: Frequency distribution of various Cadre

Variables	Seaport (N=43)	Airport (N=34)	Land border (N=123)	Total (N=200)	P-value
Cadre					< 0.001
Health Officer	9 (20.95%)	11 (32.3%)	73 (59.3%)	93 (46.5%)	
Custom Officer	8 (18.6%)	4 (11.8%)	12 (9.8 %)	24 (12.0%)	
Immigration Officer	8 (18.6%)	6 (17.6%)	4 (3.3%)	18 (9.0%)	
Security Personnel	7 (16.3%)	9 (26.5%)	14 (11.4%)	30 (15.0%)	
Quarantine Officer	7 (16.3%)	1 (2.9%)	16 (13.0%)	24 (12.0%)	
Nurse	4 (9.3 %)	3 (8.8%)	4 (3.3%)	11 (5.5%)	

From table 2, it was observed that the chi-square test of independence was used to determine if there is a significant relationship between position status and knowledge of IHR Core Capacities with the chi-square statistic (X^2) and was calculated to be 27.154 with a p-value of 0.000. Since the p-value is less than the significance level ($\alpha = 0.05$), we reject the null hypothesis. This suggests that certain roles, particularly health officers, are more likely to receive targeted training and have greater exposure to IHR-related activities. This is consistent with studies that emphasize the importance of role-specific training and continuous professional development in enhancing IHR knowledge. This result is similar to study on assessment of human resources core capacity under International Health Regulations 2005 (IHR 2005) at ports of entry (PoE) in Lagos. It revealed human resources training were inadequate across the POEs. Beddoe *et al*. pointed out that regular and systematic training is essential for maintaining an updated and well-prepared workforce capable of responding to health threats. They recommend periodic training sessions and continuous professional development to enhance the understanding and implementation of IHR.

Table 3 revealed that the test p-value is 0.000 indicates the Knowledge of IHR Implementation is dependent on Years of Experience at the Point of Entry. The chi-square test of independence was used to determine if there is a significant relationship between years of experience and knowledge of IHR Implementation with chi-square statistic (X^2) was calculated to be 22.789 with a p-value of 0.000. Since the p-value is less than the significance level ($\alpha = 0.05$), we reject the null hypothesis. This aligns with WHO guidelines that stress the need for ongoing training and experience to build and maintain IHR competencies. The WHO has developed benchmarks for IHR capacities to guide countries in their implementation efforts. These benchmarks emphasize the need for continuous training, effective communication, and coordination among various stakeholders at points of entry. It reveals the need for targeted training programs that focus on both specific roles and the accumulation of experience. Policymakers should consider implementing continuous training and professional development programs to ensure that all personnel at points of entry are adequately equipped with the necessary knowledge and skills to implement IHR core capacities effectively.

Table 2: Knowledge of knowledge of IHR Core Capacities

Position/Role at the Point of Entry	IHR core capacity training Status		X^2 statistic	Degree of freedom	P-value	Decision
	Yes (Exp.)	No (Exp.)				
Health Officer	85 (54.5)	8 (18.2)	27.154	5	0.000	There is enough data evidence to reject the null
Customs Officer	20 (12.8)	4 (9.1)				
Immigration Officer	12 (7.7)	6 (13.6)				
Security Personnel	15 (9.6)	15 (34.1)				
Quarantine Officer	16 (10.3)	8 (18.2)				
Nurse	8 (5.1)	3 (6.8)				
Total	156	44				

Table 3: Knowledge of IHR Implementation

Years of Experience at the Point of Entry:	Involving in IHR Implementation		X^2 statistic	Degree of freedom	P-value	Decision
	Yes (Exp.)	No (Exp.)				
Less than 1 year	22 (12.4)	0 (0.0)	22.789	4	0.000	There is enough data evidence to reject the null
1-3 years	81 (45.8)	8 (34.8)				
4-6 years	38 (21.5)	15(65.2)				
7-10 years	29 (16.4)	0 (0.0)				
More than 10 years	7 (4.0)	0 (0.0)				
Total	177	23				

Table 4 also shows that factors such as (Interagency collaboration) differing priorities, (Resource availability) Insufficient Equipment, Lack of Personnel and Inadequate Facilities, (Training and Capacity Building) and Inadequate Training Frequency, are significantly affecting IHR implementation at Points of Entry. Since they all have a p-value less than the significant value ($\alpha = 0.05$). This shows that there are different priorities among agencies that is significantly affecting IHR implementation with an odds ratio of 8.03932. This indicates that this factor is over eight times more likely to impact IHR implementation compared to other inter-agency collaboration issues. This aligns with findings from Wilson *et al*., who noted that coordination challenges in federal systems can undermine IHR compliance. This highlights the critical need for aligned objectives and priorities among collaborating agencies to ensure effective IHR implementation. Although not statistically significant ($p = 0.07258$), lack of coordination still poses a notable challenge. Effective interagency collaboration is crucial for managing public health emergencies.

For resource availability, the lack of sufficient equipment is a significant barrier with an odds ratio of 0.03925 and a p-value of 0.00144 which indicate a strong negative impact on IHR implementation according to Bartolini. This means there is inadequate equipment to support health measures at points of entry. Similarly, the lack of personnel is a significant factor with an odds ratio of 0.19032 and a p-value of 0.03434 and suggest that insufficient staffing levels critically hinder IHR implementation. Ensuring adequate staffing is essential for effective health regulation enforcement.

Inadequate facilities are also a factor affecting IHR Implementation at Points of Entries with an odds ratio of 14.7979 making this factor significantly more likely to affect IHR implementation when compared to other resource availability issues. This indicates that the presence of adequate facilities is crucial for the successful implementation of health regulations. A study by Akhlaq *et al*. emphasized that inadequate infrastructure, including insufficient medical facilities and equipment, poses a substantial challenge to the implementation of health regulations at points of entry. Similarly, Maphumulo, & Bhengu, (2019) pointed out that enhancing infrastructure is crucial for improving health security measures and ensuring compliance with international standards.

The shortage of adequately trained personnel is a critical constraint identified in the study. Table 4 pointed that there is an inadequate frequency in the training and capacity building at the point of entries with an odds ratio of 0.14655 and a p-value of 0.03774. This issue affects the ability to perform continuous and comprehensive surveillance and response activities. Bartolini also reiterated that infrequent training sessions negatively impact IHR implementation. This is as a result of insufficient funds for training and resources. The findings revealed that there is low proportion (0.11) and non-significant p-value (0.0973) indicate that there are insufficient funds allocated for training, equipment, and other resources needed for IHR implementation. Similar findings were reported by Suthar *et al*. (2017), who identified a lack of targeted training programs as a major barrier to effective IHR implementation. The study recommends developing comprehensive training modules that are easily accessible and tailored to the needs of health professionals. Regular and comprehensive training programs are vital for maintaining the

competency of personnel involved in IHR activities. According to Doble *et al*. (2023), effective training programs are essential for equipping health personnel with the skills necessary to implement IHR protocols efficiently. Moreover, Mohtady, Ranse, Roiko, & Desha, (2022) highlighted that ongoing capacity-building initiatives are vital for maintaining a responsive and well-prepared health workforce. While respondents have some confidence in their ability to implement IHR, there is significant room for improvement. Srinidhi *et al*. (2021) emphasized the importance of hands-on training and practical exercises to build confidence and competence among health workers. Their research suggests that experiential learning and regular drills can significantly enhance the ability of health professionals to apply IHR core capacities effectively.

Table 4 Factors Affecting IHR Implementation at Points of Entries

	Odd Ratio	**Std.Err.**	**Z**	**P>|Z|**	**[95% conf. Interval]**
(Intercept)	6.57721	2.37426	2.178	0.02938 *	[1.3123 - 41.4565]
Interagency Collaboration	Ref	ref	ref		
Lack of Coordination	3.22733	1.92047	1.795	0.07258 .	[0.9261 - 12.3636]
Differing Priorities	8.03932	2.18866	2.661	0.00779 **	[1.9041 - 43.6339]
Resource Sharing Problems	0.41343	2.04850	-1.232	0.21806	[0.0985 - 1.6986]
Availability of Technology and Innovation	Ref	ref	ref		
Good	0.51105	2.38682	-0.772	0.44033	[0.0815 - 2.6488]
Fair	0.72392	2.48879	-0.354	0.72309	[0.1085 - 4.1526]
Poor	0.35858	2.95252	-0.947	0.34348	[0.0381 - 2.8644]
Political Stability and Security	Ref	ref	ref		
Moderately	1.55339	2.35683	0.514	0.60743	[0.3024 - 9.2596]
Minimally	1.12713	2.34231	0.141	0.88818	[0.2185 - 6.4607]
Resource Availability	Ref	ref	ref		
Insufficient Equipment	0.03925	2.76221	-3.187	0.00144 **	[0.0046 - 0.2664]
Lack of Personnel	0.19032	2.19023	-2.116	0.03434 *	[0.0376 - 0.8539]
Inadequate Facilities	14.7979	3.45511	2.173	0.02976 *	[1.9927 - 359.2678]
Training and Capacity	Ref	ref	ref		

Building					
Lack of Specialized Trainers	0.93729	3.78312	-0.049	0.96118	[0.0759 - 15.6014]
Limited Training Resources	0.92484	2.60239	-0.082	0.93489	[0.1516 - 6.8382]
Inadequate Training Frequency	0.14655	2.52005	-2.078	0.03774 *	[0.0235 - 0.9463]
Regulatory and Legal Framework	Ref	ref	ref		
Enforcement Issues	0.83638	2.59910	-0.187	0.85162	[0.1476 - 7.2430]
Outdated Policies	1.43051	3.81874	0.267	0.78931	[0.0911 - 20.2013]
Lack of Legal Support	0.28289	2.11391	-1.687	0.09163	[0.0635 - 1.2567]
Infrastructure and Facilities	Ref	ref	ref		
Poor Laboratory Infrastructure	1.74969	2.13465	0.738	0.46066	[0.4222 - 8.5776]
Insufficient Communication Infrastructure	3.09829	2.91927	1.056	0.29117	[0.4286 - 31.4918]
Limited Access to Emergency Resources	0.26052	2.01861	-1.915	0.05550	[0.0652 - 1.0720]

Table 5: One-Sample Test of Proportion for Proper Implementation

	Statement	Resources for Proper Implementation					
		Yes	No	Proportion	DF	P-value	Decision
RQE24	Are the physical facilities at your point of entry adequate for implementing IHR?	16316	37	0.82	1	2.2e-	Reject the null
RQE25	Do you have access to the necessary equipment and materials to implement IHR effectively?	15916	41	0.80	1	2.2e-	Reject the null
RQE28	Is the current staffing level sufficient to handle peak periods or emergencies?	17516	25	0.88	1	2.2e-	Reject the null
RQE32	Are there sufficient funds allocated for training, equipment, and other resources needed for IHR implementation?	22	178	0.11	1	0.0973	Retain the null
RQE33	Do financial constraints limit the effective implementation of IHR at your point of entry?	177	23	0.12	1	0.0873	Retain the null

From table 5, 82% of respondents confirmed that physical facilities at their point of entry are adequate for implementing International Health Regulations (IHR). This high proportion, with a p-value of 2.2e-16, indicates strong evidence to reject the null hypothesis, suggesting that more than 50% of respondents have adequate physical facilities. Adequate physical infrastructure is crucial for effective implementation of health regulations. Moullin *et al*. (2020) highlighted that well-maintained facilities enhance operational efficiency and compliance with health standards. Moreover, the table also reports 80% of respondents have access to necessary equipment and mat4erials for effective IHR implementation. With p-value of 2.2e-16, this result also rejects the null hypothesis which means that sufficient resources are available for most respondents. Access

to essential equipment and materials is a critical determinant of successful implementation. Moreover, 88% of respondents believe current staffing levels are sufficient to handle peak periods or emergencies. The high proportion and significant p-value (2.2e-16) indicate adequate staffing levels. However, this finding should be interpreted with caution. Therefore, ongoing training and support are essential to maintain staff readiness and effectiveness, especially during emergencies. In addition, only 11% of respondents reported sufficient funds allocated for training, equipment, and other resources. The retention of the null hypothesis (p-value of 0.0973) underscores a significant funding gap. This aligns with findings from Barwick *et al*. (2020), who noted that financial constraints are a major barrier to effective implementation. The lack of funding can lead to inadequate training and outdated equipment and ultimately compromising the quality of implementation. Innovative funding solutions and strategic resource allocation are necessary to address these gaps. Also, 12% of respondents indicated that financial constraints limit effective IHR implementation. The retention of the null hypothesis (p-value of 0.0873) highlights the pervasive issue of financial constraints. This finding suggests a need for policy interventions and increased investment to mitigate financial barriers and ensure sustainable implementation efforts.

4. CONCLUSION

The study identifies significant challenges in implementing the International Health Regulations (IHR) at points of entry, which include infrastructure limitations, inadequate training, poor inter-agency coordination, and communication barriers. Many points of entry lack the necessary facilities, technology, and resources to effectively monitor and respond to public health risks. While personnel have a general understanding of IHR, insufficient specific training and lack of consistent updates prevent them from fully implementing disease surveillance and response measures.Additionally, the study highlights poor coordination between key agencies such as health, immigration, and customs, which hampers efficient responses to health threats. Effective communication is further complicated by the lack of standardized systems for sharing crucial health information, both between agencies and across borders.To address these issues, the study calls for comprehensive strategies. These include investing in better infrastructure, providing ongoing and updated training to staff, enhancing inter-agency coordination with clear communication frameworks, and improving information-sharing mechanisms to ensure rapid responses. By addressing these challenges, countries can strengthen their capacity to manage public health emergencies at points of entry, which is essential for global health security.

REFRENCES

Adiama, Y., Adewoy, S., Olaniyi, O., Habeeb, L., Ahmed, A., & Raimi, M. (2022). No one is leaving this time: Appraisal of awareness and knowledge of port health officers on International Health Regulation IHR (2005). *bioRxiv*. https://doi.org/10.1101/2022.01.12.476011

Akhlaq, A., McKinstry, B., Muhammad, K. B., & Sheikh, A. (2016). Barriers and facilitators to health information exchange in low-and middle-income country settings: A systematic review. *Health Policy and Planning, 31*(9), 1310-1325.

Anyanwu, M. U., Festus, I. J., Nwobi, O. C., Jaja, C.-J. I., &Oguttu, J. W. (2020). A perspective on Nigeria's preparedness, response and challenges to mitigating the spread of COVID-19. *Challenges, 11*(2), 22. https://doi.org/10.3390/challe11020022

Bartolini, G. (2021). The failure of 'core capacities' under the WHO International Health Regulations. *International and Comparative Law Quarterly, 70*(1), 233-250. https://doi.org/10.1017/S0020589320000470

Beddoe, L., Hay, K., Maidment, J., Ballantyne, N., & Walker, S. (2018). Readiness to practice social work in Aotearoa New Zealand: Perceptions of students and educators. *Social Work Education, 37*(8), 955-967. https://doi.org/10.1080/02615479.2018.1497152

DeShore, N. E. (2020). Impact of global health governance on transnational health security threats: An evaluation of the Global Health Security Agenda Steering Group. Central Michigan University.

de Rooij, D. (2024). Bonds, bounds, and burdens at the borders: Enhancing public health capability at European points of entry.

Erondu, N. A., Martin, J., & Pavlin, B. I. (2018). Strengthening health security at points of entry: The public health response to communicable disease threats. *Health Security, 16*(4), 206-211.

Gray, S. A., Tolbert GeewlehNyenswah, J. S. M. G. S., Maame Amo-Addae, H. W. S., Obafemi Joseph Babalola, P. K. B., & Chukwuma David Umeokonkwo. (2024). Evaluation of the International Health Regulations core capacities at designated points of entry in Liberia, December 2019. *Journal of International Epidemiology and Public Health, 7*(1), 8. https://doi.org/10.37432/jieph.2024.7.1.99

Gostin, L. O., & Katz, R. (2020). The International Health Regulations: The governing framework for global health security. *The Lancet, 396*(10263), 2114-2121.

Heymann, D. L., Chen, L., Takemi, K., Fidler, D. P., Tappero, J. W., Thomas, M. J., ... & Kalil, A. C. (2017). Global health security: The wider lessons from the west African Ebola virus disease epidemic. *The Lancet, 385*(9980), 1884-1901.

Hsu, L. Y., Chia, P. Y., & Lim, J. F. (2017). The novel coronavirus (SARS-CoV-2) pandemic. *Annals Academy of Medicine Singapore, 49*(1), 1-3.

ICAO and WHO. (2024). The postal history of ICAO. [online] Available at: https://applications.icao.int/postalhistory/icao_and_the_world_health_organization.htm [Accessed 19 May 2024].

Kamara, K. N., Squire, J. S., Kanu, J. S., Carshon-Marsh, R., Koroma, Z., Koroma, A. T., ... & Vandi, M. A. (2022). Assessment of infection prevention and control measures at points of entry in Sierra Leone in 2021: A cross-sectional study. *International Journal of Environmental Research and Public Health, 19*(10), 5936.

Katz, R., & Seabrook, L. (2019). The International Health Regulations (2005): The role of legal frameworks in global health security. *Global Health Governance, 13*(2), 1-11.

Kunnuji, J. (2020). A chronicle of cultural transformation: Ethnography of Badagry Ogu musical practices.

Leal Filho, W., Brandli, L. L., Lange Salvia, A., Rayman-Bacchus, L., &Platje, J. (2021). COVID-19 and the UN sustainable development goals: Threat to solidarity or an opportunity? *Global Health Journal, 5*(4), 270-274.

Lone, S. A., & Ahmad, A. (2017). COVID-19 pandemic–An African perspective. *Emerging Microbes & Infections, 6*(3), 45-49.

Martini, M., & Checchi, F. (2019). The role of the IHR in addressing public health emergencies. *Global Health Action, 12*(1), 234-245.

Maphumulo, W. T., & Bhengu, B. R. (2019). Challenges of quality improvement in the healthcare of South Africa post-apartheid: A critical review. *Curationis, 42*(1), 1-9.

Mohtady Ali, H., Ranse, J., Roiko, A., & Desha, C. (2022). Healthcare workers' resilience toolkit for disaster management and climate change adaptation. *International Journal of Environmental Research and Public Health, 19*(19), 12440.

Mouchtouri, V. A., Christoforidou, E. P., An der Heiden, M., Menel Lemos, C., Fanos, M., Rexroth, U., ... &Hadjichristodoulou, C. (2019). Exit and entry screening practices for infectious diseases among travelers at points of entry: Looking for evidence on public health impact. *International Journal of Environmental Research and Public Health, 16*(23), 4638.

Moullin, J. C., Dickson, K. S., Stadnick, N. A., et al. (2020). Ten recommendations for using implementation frameworks in research and practice. *Implementation Science Communications, 1*, 42. https://doi.org/10.1186/s43058-020-00023-7

Nuzzo, J. B., Meyer, D., Snyder, M., & Ravi, S. J. (2019). What makes health systems resilient? *Globalization and Health, 15*(1), 3-5.

Sharma, S. K., & Mudgal, S. K. (2021). International health regulations and pandemic preparedness: Perspectives from COVID-19. *Journal of Global Health Reports, 5*(2), 1-5.

Sohn, M., Ro, D., Koh, D. H., Lee, S., & Kim, S. Y. (2021). The problems of International Health Regulations (IHR) in the process of responding to COVID-19 and improvement measures to improve its effectiveness. *Journal of Global Health Science, 3*(2).

Suthar, A., Allen, L., Cifuentes, S., Dye, C., & Nagata, J. (2017). Lessons learnt from implementation of the International Health Regulations: A systematic review. *Bulletin of the World Health Organization, 96,* 110-121E. https://doi.org/10.2471/BLT.16.189100.

Usman, M. S., Olalubi, O. A., & Sawyerr, H. O. (2018). Assessment of human resources core capacity under International Health Regulations 2005 (IHR 2005) at ports of entry (PoE) in Lagos. *IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT), 12*(9), 1-8. https://doi.org/10.9790/2402-1209020108

Van Kerkhove, M. D., & Briand, S. (2020). The role of the International Health Regulations in preventing and managing health crises. *Bulletin of the World Health Organization, 98*(5), 302-308.

Wilson, K., McDougall, C., Fidler, D., & Lazar, H. (2008). Strategies for implementing the new International Health Regulations in federal countries. *Bulletin of the World Health Organization, 86*(3). https://iris.who.int/bitstream/handle/10665/270139/PMC2647397.pdf?sequence=1