Egyptian Journal of Community Medicine

Awareness of Staff Working in Quarantine Departments at Egyptian Airports About Implementation of Infection Prevention and Control Measures

Seham Ahmed Abokresha [1], Alaa Ahmed Ghaleb [2], Dalia Khamis Eldeeb [3]

[1] Public Health and Community Medicine Department, Faculty of Medicine Sohag University, Sohag, Egypt
[2] Cardiology Department, Faculty of Medicine Sohag University, Sohag, Egypt
[3] Public Health and Community Medicine Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt

Submission Date: 2024-11-03

Revision Date: 2024-12-25

Acceptance Date: 2025-01-01

Key Words: Infection control, quarantine, airports, awareness, Egypt

ABSTRACT

Background: Infection prevention and control (IPC) measures are vital in limiting the spread of infectious diseases, particularly at international points of entry (POEs) such as airports. Quarantine departments at Egyptian airports are critical in managing potential health risks posed by incoming travellers. **Objective:** To assess the awareness of quarantine workers with IPC protocols across major airports in Egypt. **Method:** A cross-sectional study was conducted in July 2024, using a structured, validated questionnaire based on the 2018 WHO IPCAF tool. The survey, which consisted of 53 questions, evaluated the knowledge and practices of quarantine workers at five Egyptian airports: Cairo, Aswan, Sohag, Luxor, and Taba. Participants (n=160) were recruited via convenience sampling, and the data were analysed using SPSS and R Studio. **Results:** Of the 160 participants, 70% were male, with a median age of 34 years. IPC compliance levels were rated as "advanced" (≥76%) at all five airports, with IPC guidelines achieving the highest score (98.5%), followed by cleaning and sanitation (93.5%), and monitoring IPC practices (89%). However, gaps were identified in IPC training, with 76.5% compliance, and the provision of personal protective equipment and referral systems, which were rated as "intermediate" at most airports. **Conclusion:** The study found that while IPC measures at Egyptian airports are generally advanced, gaps in training, equipment provision, and cleaning practices need to be addressed. Strengthening these areas, particularly through improved training for specific staff groups such as cleaning personnel, is essential for maintaining high standards of IPC at POEs.

INTRODUCTION

Maintaining public health and halting the spread of infectious diseases depends critically on quarantine department employees at Egyptian airports being knowledgeable of the application of infection prevention and control (IPC) methods.[1, 2] Strong IPC regulations are essential since airports play a crucial role as international gateways. The spread of illnesses like COVID-19 has highlighted the need for stricter health regulations and more awareness at ports of entry. It has also highlighted how important it is that staff members in quarantine departments have thorough training in IPC procedures.[1]

First and foremost, it's critical to acknowledge the special circumstances surrounding airports, where a significant risk of infectious agent introduction and spread arises from the large number of foreign visitors.[3]

Corresponding Author: Seham Ahmed Abokresha, Public Health and Community Medicine Department, Faculty of Medicine Sohag University, Sohag, Egypt. Email: sehamghalib@yahoo.com

As the first line of defense, quarantine departments are responsible for managing suspected cases, enforcing quarantine regulations, and keeping an eye out for any signs of disease in arriving tourists.[4] The workers' understanding and compliance with IPC measures which encompass a variety of practices like as using personal protective equipment (PPE), maintaining good hand hygiene, cleaning the environment, and managing waste are critical to the efficacy of these departments.[4]

Research has indicated that thorough training programs greatly improve health workers' understanding of and application of IPC.[5] Sessions of hands-on training and continuous education are essential in the setting of Egyptian airports.[2, 5] The fundamentals of IPC, the epidemiology of prevalent infectious illnesses, and the procedures for handling suspected cases should all be covered in these courses. Airports can reduce the risk of disease transmission by encouraging a culture of ongoing learning and adhering to IPC principles.[5]

Moreover, the role of institutional support and resource availability cannot be overlooked. The provision of adequate PPE, hand sanitizers, and disinfection supplies is fundamental. Equally important is the establishment of clear communication channels and protocols for reporting and managing potential infectious disease cases.[6] Research indicates that well-supported health workers are more likely to comply with IPC measures. In this regard, the Egyptian government and airport authorities must ensure that quarantine departments are equipped with the necessary resources and support systems.[6]

Airports are hubs of global travel, making them potential hotspots for the transmission of infectious agents. Conducting a study to investigate the awareness of workers in quarantine departments at Egyptian airports about implementing IPC measures is imperative due to the critical role these workers play in preventing the spread of infectious diseases at key international points of entry (POEs). An in-depth investigation into the current knowledge base, attitudes, and behaviors of these frontline workers will yield important insights that will facilitate the creation of customized training curricula, strategies for allocating resources, and policy suggestions. As a result, the general efficacy of IPC measures at Egyptian airports will be improved, safeguarding public health both domestically and internationally. The objective of the current study was to assess the awareness of quarantine workers with IPC protocols across major airports in Egypt.

METHODS

A cross section analytical observational study was utilized to gather data during July 2024.This study employed a quantitative research design to objectively measure the level of awareness among workers in quarantine departments.

The five approved PoEs served as the study's locations. There are officers and employees from customs, immigration, agriculture, the Office of National Security, the pharmacy, port health, cleaners, and other support services working at all five PoEs. The port health personnel comprise public health or clinical officials who are tasked with screening tourists for infectious disease symptoms and signs, verifying their vaccination status, and maintaining environmental sanitation. Additionally, they keep an eye on and assess all medications, cosmetics, foodstuffs, disinfectants, and hazardous materials coming into or going out of the nation.

Inclusion Criteria: Workers actively employed in quarantine departments at Egyptian airports. Exclusion Criteria: Workers who are on leave, off-duty, or not directly involved in IPC activities.

We interviewed 160 port health staff members: 32 at Cairo International Airport, 32 at Aswan International Airport, 31 at Sohag International Airport, 36 at Luxor International Airport and 29 at Taba International airport. A convenience sampling method was used to recruit participants from different quarantine departments across Egyptian airports.

Data Collection: Survey Instrument: a standardized Infection prevention and control assessment framework (IPCAF) instrument (2018 version) of the World Health Organization (WHO),[7] which is a structured questionnaire based on established literature on IPC methods and validated scores. The online survey was conducted via a website link (http://forms.office.com).[7] It is a methodical instrument that offers an initial assessment of the IPC program and activities within a medical facility in addition to continuous evaluations via repeated administration to track development over time and promote improvement. The questionnaire is closed-ended and organized, having eight components that

Table 1: General characteristic of the study group, Egypt, July 2024 (n=160)

	N (%)
Age (years, median and IQR)	34 (28-41)
Gender	
Female	48 (30)
Male	112 (70)
Occupation	
Information Center Officer	8 (5.0)
Medical registration and statistics technician	24 (15)
Doctor	40 (25)
Health observer	43 (27)
Nurse	36 (23)
Pharmacist	9 (5.6)
Airport	
Aswan international airport	32 (20)
Cairo international airport	32 (20)
Luxour international airport	36 (23)
Sohag international airport	31 (19)
Taba international airport	29 (18)

Data were presented as number and percentage, unless mentioned otherwise

make up the score system. A facility is categorized into one of four IPC promotion and practice levels based on the total percentage attained in the eight parts. There were four portions in it: Core components 2 (IPC guidelines), 3 (IPC education and training), and 6 (monitoring/auditing IPC procedures and providing feedback) are all essential. A few elements of Core component 8 that we dubbed cleaning and sanitation (built environment, materials, and equipment for IPC at the facility level). Based on the IHR guideline for fundamental competencies at PoEs including screening, isolation, and a referral system for sick/suspected travelers, three additional sections (a screening station, an isolation facility, and a referral system) were created and added to the tool. There are subcomponent questions in every portion of the modified instrument, for a total of 53 questions in the evaluation. The majority of questions are coded as 1 or 0, depending on whether the answer is yes or no. Compliance was rated as none (0), medium (0.5), or full (1) on a few questions. After summing up and dividing by the total number of responses, the total number of inquiries for that particular element. After multiplying this by 100, the percentage scores were obtained. Each POE was graded at one of four levels of IPC promotion and practice, as indicated by the WHO IPCAF tool: Inadequate (0–25%), Basic (26–50%), Intermediate (51–75%), or Advanced (76–100%), based on the overall percentage results in the seven categories.

Data Analysis: The collected data had been coded and verified before computerized data entry. The collected data was statistically analyzed using the Statistical Package for the Social Science (SPSS) version 26 and R studio programming version 2023 and expressed in tables and charts. Score (1) Yes, No=0. The percentage of IPC score was calculated as the total score of questions divided by 53 multiplied by 100. The Level of IPC promotion was graded into advanced (above 76%), intermediate (75% to 51%), basic (50% to 26%) and inadequate (less than 25%). Using the Chi-squared test, the level of IPC was correlated with the location of airport. A correlation graph was done between IPC scores. Univariate and multivariate regression analysis to see factors of advanced response versus intermediate. In all analyses, $P < 0.05$ indicated statistical significance.

RESULTS

A total 160 health staff members were included: 32 at Cairo International Airport, 32 at Aswan International Airport, 31 at Sohag International Airport, 36 at Luxor International Airport and 29 at Taba International airport.

The median age of respondents was 34 years, 30% were females and 70% were males. Regarding the type of occupation of the staff members, 27% were health observers, 23% were nurses, 25% were doctors, 15% were medical registration and statistics technicians, 5.6% were pharmacists and 5% were information center offices (Table 1).

The IPC measure scores for each PoE are displayed in Availability and Score of Each IPC Component at Individual POE. Highly advanced operating procedures (SOP) on information protection (IPC) were accessible at all five PoEs, and IPC practices were monitored. Additionally, 76 percent of the five airports have advanced isolation referral systems, cleaning and sanitation, and screening stations available (Table 2).

Regarding the score and the level of each IPC component measure at the five PoEs collectively Table 3 summarizes scores on IPC measures at the five class A PoEs in Egypt. IPC measures advanced level in each

Table 2: Infection prevention and control (IPC) component scores by point of entry location, Egypt, July 2024

	Expected score	Cairo	Sohag	Aswan	Luxor	Taba
		N (%)	N (%)	N (%)	N (%)	N (%)
Cumulative score	**53**	**49 (92.5)**	**47.5 (90)**	**47 (89)**	**47 (89)**	**47 (89)**
Components						
IPC guidelines	12	12 (100)	12 (100)	12 (100)	11.5 (96)	11.5 (96)
IPC training	6	5 (83.5)	4.5 (75)	4.5 (75)	4.5 (75)	4.5 (75)
Monitor IPC practices	10	9 (90)	9 (90)	9 (90)	9 (90)	8.5 (85)
Screening station	8	7.5 (94)	7 (87.5)	7 (87.5)	7.5 (94)	7.5 (94)
Cleaning & sanitation	6	6 (100)	5.5 (92)	5.5 (92)	5.5 (92)	5.5 (92)
Isolation facility	6	5.5 (92)	5.5 (92)	5 (83)	5 (83)	5.5 (83)
Referral system	5	4 (80)	4 (80)	4 (80)	4 (80)	4 (80)

component and totally. The IPC guidelines had highest recorded score (98.5%; 59/60) followed by cleaning and sanitation (93.5%; 28/30), then screening station 91%, Monitor IPC practices 89%, isolation facility 88.5%, referral system 80% and finally the lowest score recorded was IPC training 76.5%.

There is no significant difference between the location of airport and the level of IPC (Table 4). Identified gaps in specific IPC components at the five PoEs was illustrated in detail in Table 1 (Supplementary data). Most IPC components were in the advanced level (no gabs) except the port cleaning staff trained on basic IPC was intermediate in the four PoEs (Sohag, Aswan, Luxor and Taba), while, in Cairo Airport was advanced without gab. Sufficient personal protective equipment's; well-maintained material for cleaning and having key information of referral health facilities were in the intermediate level in the five PoEs. Isolation area standard with separate toilet and waste management and PoE have channel & procedures for communicating health measure on arrival and departure were in the intermediate level in the four PoEs (Cairo, Aswan, Luxor and Taba) but in Sohag were in the basic level.

The correlation matrix between IPC components scores showed positive correlations between components scores. There was positive excellent correlation between referral system score and isolation facility score. There was positive moderate correlation between isolation facility score and each of IPC guidelines and training; also, between cleaning sanitation each of IPC guidelines and training; and IPC training and each of screening station and IPC practices score. Other components there were mild positive correlations.

The Univariate and multivariate regression analyses aimed to identify parameters associated with advanced level of IPC in the five PoEs. The only significant factor was being medical registration and statistics technician with negative odd in both univariate and multivariate analysis. (Table 5)

DISCUSSION

This study to assess IPC measures in Egypt at the five class A PoEs. The resistant antimicrobials organism can travel and enter the country as well as the passengers and goods. The study aimed to identify the gaps of IPC measures at 5 class A PoEs and give recommendations for improving. Good IPC measures at the PoEs protect working staff as well as travelers at the Airport line. [8]

After conducting the survey on 160 port health staff members: 32 at Cairo International Airport, 32 at Aswan International Airport, 31 at Sohag International Airport, 36 at Luxor International Airport and 29 at Taba International airport. The overall score of IPC measures for each PoF was calculated. Highly advanced guidelines operating procedures on IPC activities were available, and there was monitoring of IPC practices. Also, the availability of screening station, cleaning and sanitation and isolation referral systems were advanced in the five airports ≥76%. This advanced level reflects good overall IPC measures at 5 class A PoEs which protect port staff members and travelers from antimicrobials resistant organisms.

Table 3: Summary of infection prevention and control (IPC) component scores at all points of entry locations combined, Egypt, July 2024

	Expected score	Reported score	Level of IPC measures
	N	N (%)	
IPC guidelines	60	59 (98.5)	Advanced
IPC training	30	23 (76.5)	Advanced
Monitor IPC practices	50	44.5 (89)	Advanced
Screening station	40	36.5 (91)	Advanced
Cleaning & sanitation	30	28 (93.5)	Advanced
Isolation facility	30	26.5 (88.5)	Advanced
Referral system	25	20 (80)	Advanced
Total score	**265**	**237.5 (90)**	**Advanced**

Table 4: Overall level of IPC measures by the point of entry locations in Egypt, July 2024

	Aswan	Cairo	Luxor	Sohag	Taba	Total	P value
Advanced	31 (96.9%)	31 (96.9%)	35 (97.2%)	30 (96.8%)	29 (100%)	156 (97.5%)	0.9
Intermediate	1 (3.1%)	1 (3.1%)	1 (2.8%)	1 (3.2%)	0 (0)	4 (2.5%)	

The screening methods protocol design and the robustness of application can influence the effectiveness of screening measures. The techniques utilized for assessing exposure and symptoms, the kinds of tools and equipment that are employed, the quantity of employees participating, and their level of training all influence how well screening measures turned out. [9] The advanced level scores at the class A airports may be due to higher number of travelers passing through them and the advanced training measures that were taken during the pandemic of COVID 19. [8]

IPC measures showed advanced level in each component and totally. The IPC guidelines had highest recorded score (98.5%; 59/60) followed by cleaning and sanitation (93.5%; 28/30), then screening station 91%, Monitor IPC practices 89%, isolation facility 88.5%, referral system 80% and finally the lowest score recorded was IPC training 76.5%.

IPC guidelines were in advanced level without gap in the five PoEs. IPC guidelines include screening passengers upon travel or departure, isolation of suspected/sick travelers, referral of suspected/sick travelers, hand hygiene guidelines, outbreak management and preparedness, cleaning and disinfection, port health staff protection and safety and Waste management.

Entry and exit screening are components of the national and international policies of competent authorities to prevent the transmission of illness and to lessen their effects on trade and travel, which can be negatively impacted by insufficient measures that can make disease spread. [10,11]

IPC training includes port health trained on basic IPC, interactive training, port cleaning trained on basic IPC and Administrative and managerial staff received basic IPC training.

The port cleaning staff trained on basic IPC was intermediate level in the four PoEs (Sohag, Aswan, Luxor and Taba), while, in Cairo Airport was advanced without gab.

The inadequate trained cleaning staff and inadequate coordination between staff members were the major challenges at PoEs.[5] To improve disease surveillance, laboratory and outbreak response capacity and efficiency for detection and response to public health threats, while avoiding interruption of routine services. This would be done through detection, prevention, and response to public health threats or events and good training to staff members.[12,13]

Monitor IPC include compliance, trained personnel responsible for the monitoring of IPC practices, well-defined structured checklist for monitoring, hand hygiene compliance, cleaning and disinfection of the environment and waste management monitor with advanced level in the five PoEs in our study.

Table 5: Univariate and multivariate multinomial regression analysis of parameters predictors of having advanced IPC versus intermediate IPC

	Univariable models				Multivariate model			
	Beta	95% confidence		P value	Beta	95% confidence		P value
		Lower	Upper			Lower	Upper	
Age	0.00	-0.00	0.00	0.09	0.00	-0.00	0.00	0.3
Gender (male)	-0.04	-0.09	0.02	0.1	0.01	-0.07	0.09	0.7
Occupation (information center)								
Medical registration technician	-0.17	-0.29	-0.05	0.006*	-0.18	-0.31	-0.05	0.006*
Doctor	-0.00	-0.11	0.11	1.0	-0.01	-0.13	0.11	0.8
Health observer	0.00	-0.11	0.11	1.0	-0.02	-0.14	0.10	0.7
Nurse	0.00	-0.11	0.11	1.0	-0.02	-0.14	0.10	0.7
Pharmacist	0.00	-0.14	0.14	1.0	-0.01	-0.16	0.14	0.8
Airport (Aswan)								
Cairo	-0.00	-0.08	0.08	1.0	-0.01	-0.09	0.06	0.7
Luxour	0.00	-0.07	0.08	0.9	0.01	-0.06	0.08	0.7
Sohag	-0.00	-0.08	0.08	0.9	0.02	-0.06	0.09	0.6
Taba	0.03	-0.05	0.11	0.4	0.04	-0.04	0.12	0.3

**P value<0.05 is significant*

Against our study Kamara et al. found that IPC guidelines and periodic monitoring of IPC practice at POEs in Sierra Leone in 2021 were almost absent. [8]

Effective IPC measures must be implemented at PoEs to reduce or stop the transmission of infections, including AMR. Cross-border patient migration has been found to be a risk factor for the introduction of Enterobacteriaceae that produce carbapenems into healthcare environments and systems. [15]

Screening measures score include availability, algorithm, register, manned by port health staff, functional infrared thermometer and hand hygiene and sufficient water services and personal protective equipment. The sufficient personal protective equipment were in the intermediate level at the five PoEs.

Employees performing the primary screening may not have formal expertise in public health or medicine, but they nonetheless conduct an initial assessment. Activities include taking visitors' body temperatures, visually observing them for indications of infectious disease, and having them fill out a questionnaire requesting information on the presence of symptoms and/or exposure to the infectious agent. Referrals to secondary screening are made for travelers exhibiting indications of the infectious disease or who may have come into contact with the agent. Personnel trained in public health or medicine should perform secondary screening. It consists of a thorough interview, a targeted physical and laboratory assessment, and a second temperature check. [16,17]

Regarding cleaning and sanitation, the component measured, dedicated personnel for cleaning, well maintained toilet facility, well maintained material for cleaning and appropriate method of waste disposal. Well maintained material for cleaning were in the intermediate level at the five PoEs.

Kamara et al. 2021 suffered from lacked isolation areas for infected passengers, insufficient personal protective equipment and there one PoE with no toilet facility.[8]

Phongsawat, 2008 reported about people expectation of airport toilet that people believed that the worst issue with the toilets was their availability. Additionally, many made comments regarding how clean the toilet floors were, with a few female users suggesting that the airport operator should add more spaces for people to easily store their items near the water basins. Therefore, to better satisfy the needs and expectations of users, the airport operator should increase the number of toilets, enhance the cleanliness of the toilet's floors, and add more locations for female toilets.[18]

Regarding isolation and referral systems: isolation area standard with separate toilet and waste management and PoE have channel & procedures for communicating health measure on arrival and departure were in the intermediate level in the four

PoEs (Cairo, Aswan, Luxor and Taba) but in Sohag were in the basic level.

Immigration PoEs are among the primary locations for isolation facility and referral, in addition to health facilities, where IPC measures must be put into place and closely watched to stop the spread of infectious illnesses because of population mobility. [18,19]

The IPC components were strongly correlated between each other's like a necklace. There was positive excellent correlation between referral system score and isolation facility score. There was positive moderate correlation between isolation facility score and each of IPC guidelines and training; also, between cleaning sanitation each of IPC guidelines and training; and IPC training and each of screening station and IPC practices score. Other components there were mild positive correlations.

With assistance from the WHO Country Office IPC/AMR team as well as the national IPC and port health departments of the Ministry of Health and Sanitation, the WHO IPCAF tool was adapted using a multidisciplinary collaborative approach. This strategy made ensuring that a tool that was appropriate for IPC assessment at PoEs was developed. Additionally, the presence of a team comprising the PI, employees from the National IPC, and port health departments guaranteed the reliability and correctness of the data. Thus, the data accurately depict the PoEs' operational reality. Additionally, the study complied with the reporting requirements established by Strengthening the Reporting of Observational Studies in Epidemiology (STROBE). [8, 20,21]

Being medical registration and statistics technician was associated with significant intermediate response in both univariate and multivariate analysis. Identifying the weak points is the main idea of strength and working to increase medical registration and statistics technician knowledge is very recommended. Countries must build strong multisectoral systems to quickly identify and address communicable diseases that are imported as well as those that are domestically spread to maintain global health security. This is crucial because, as previous global disease outbreaks like COVID -19 have shown, there is a chance that an illness could spread before public health services have a chance to react. [22,23]

Limitation of the study

Since we could not cover all Egyptian airports' workers at quarantine departments, the study findings should be generalized with caution. Since the data is self-reported, information bias cannot be excluded. Finally, the data represent awareness of the IPC measures not the actual compliance. Therefore, future studies auditing compliance with IPC measures may be justified.

CONCLUSIONS

The study conducted at five important PoEs for the first time in Egypt to evaluate the gap in IPC measures for transportation to limit spread of infectious diseases. There were intermediate gaps in the port cleaning staff trained on basic IPC, sufficient personal protective equipment's; well-maintained material for cleaning and having key information of referral health facilities in the five PoEs. Isolation area standard with separate toilet and waste management and PoE have channel & procedures for communicating health measure on arrival and departure were in the intermediate level in the four PoEs (Cairo, Aswan, Luxor and Taba) but in Sohag were in the basic level. The findings underscore the importance of providing adequate personal protective equipment's, availability of toilets with separate rooms for isolations and waste management. Additionally, findings underscore the need of focused training for all staff port members especially medical registration and statistics technician in all PoEs especially Sohag Airport.

List of abbreviations

IPC, Infection Prevention and Control; **PPE**, Personal Protective Equipment; **IPCAF**, Infection Prevention and Control Assessment Framework; **PoE**, Point of Entry; **IHR**, International Health Regulations**; AMR**, Antimicrobial Resistance; **STROBE**, Strengthening the Reporting of Observational Studies in Epidemiology.

Ethical Considerations

The Research Ethics Committee of the Faculty of Medicine, Alexandria University approved this research with a reference number IRB No: 00012098, FWA No:00018699 on 9th June 2024. Participants were provided with key information about the research before deciding whether to take part or not. All study participants gave an informed consent. Throughout the research process, the study subjects' privacy was

respected. The information was kept anonymous, and each person was assigned merely a number.

Competing interests

The authors declare that they have no competing interests.

Funding

None received

Authors' contributions

SA contributed to the design of the study, analysis and interpretation of the data, and writing the original draft of the article. AG DE critically revised the manuscript for intellectual content before submission. Both SA and DE contributed to the conception of the study and data collection. All authors read and approved the manuscript.

Availability of data and materials

Data are available from the corresponding author on reasonable request. Confidentiality and security of data and materials were ensured through all stages of the study.

REFERENCES

1. Afulani PA, Gyamerah AO, Aborigo R, Nutor JJ, Malechi H, Laar A, et al. Perceived preparedness to respond to the COVID-19 pandemic: a study with healthcare workers in Ghana. MedRxiv. 2020:2020.07. 10.20151142.
2. Al Mutair A, Alhumaid S, Al Alawi Z, Zaidi ARZ, Alzahrani AJ, Al-Tawfiq JA, et al. Five-year resistance trends in pathogens causing healthcare-associated infections at a multi-hospital healthcare system in Saudi Arabia, 2015–2019. Journal of global antimicrobial resistance. 2021;25:142-50.
3. Ayinde O, Usman AB, Aduroja P, Gbolahan A. A cross-sectional study on Oyo state health care workers knowledge, attitude and practice regarding corona virus disease 2019 (COVID-19). 2020.
4. Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, Bandari DK. Knowledge and perceptions of COVID-19 among health care workers: cross-sectional study. JMIR public health and surveillance. 2020;6(2):e19160.
5. World Health Organization. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance, 12 July 2021.
6. Amali OO. Infection prevention knowledge and practices among health care workers at Federal Medical Center Makurdi, Benue State, Nigeria: University of Johannesburg (South Africa); 2022.
7. IPCAF-Facility. [(accessed on 4 April 2021)]. Available online: https://www.aktion-sauberehaende.de/fileadmin/ash/Aktionstage/2019AT_Aller-Hand/IPCAF-facility.pdf
8. Kamara KN, Squire JS, Kanu JS, Carshon-Marsh R, Koroma Z, Koroma AT, Maruta A, Kallon C, Manzi M, Camara BS, Sargsyan A. 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. 2022 May 13;19(10):5936.
9. World Health Organization. Public health measures taken at international borders during early stages of pandemic influenza A (H1N1) 2009: preliminary results: Background. Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire. 2010;85(21):186-95.
10. Mouchtouri VA, Christoforidou EP, An der Heiden M, Menel Lemos C, Fanos M, Rexroth U, Grote U, Belfroid E, Swaan C, Hadjichristodoulou C. 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. 2019 Dec;16(23):4638.
11. Eurosurveillance editorial team. The European Commission Consumers, Health, Agriculture and Food Executive Agency (CHAFEA) call for tender concerning studies on vaccination closes on 13 September.
12. World Health Organization. Joint external evaluation of IHR core capacities of the Republic of Latvia: mission report: 8-12 May 2017. World Health Organization; 2017.
13. Africa CDC. Providing a Legal Framework for a National Public Health Institute (NPHI) [Internet]. Addis Ababa (ET): Africa Centres for Disease Control and Prevention; 2019 Sep 9 [cited 2024 Feb 21]. 79p. Download Providing-Legalframework-NPHIs.pdf.
14. Gray SL, Nyenswah TG, Gilayeneh JS, Sr MA, Sesay HW, Babalola OJ, Bemah PK, Umeokonkwo CD. Evaluation of the International Health Regulations core capacities at designated points of entry in Liberia, December 2019. Journal of Interventional Epidemiology and Public Health. 2024 Feb 27;7(8).
15. European Centre for Disease Prevention and Control Risk . Assessment on the Spread of Carbapenemase-Producing Enterobacteriaceae (CPE): Through Patient Transfer between Healthcare Facilities, with Special Emphasis on Cross-Border Transfer. EU; London, UK: 2011.
16. World Health Organization [(accessed on 8 August 2018)];Technical Note for Ebola Virus Disease Preparedness Planning for Entry Screening at Airports, Ports and Land Crossings. 2014 Available online: https://apps.who.int/iris/handle/10665/144819
17. CDC [(accessed on 8 August 2018)];Ebola Virus Disease (Ebola) Pre-Departure/Exit Screening at Points of Departure in Affected Countries. 2014 Available online:

https://http//wwwnc.cdc.gov/travel/pdf/ebola-exit-screening.pdf

18. Phongsawat C. Expectations of users utilizing public toilets at the passenger terminal complex of Suvarnabhumi Airport. Thammasat University; 2008.
19. World Health Organization. Harmonized sub-regional essential infection prevention and control (IPC) services at points of entry and within-country IPC interventions for transnational truck drivers within East African community.
20. Meesit A.K., Wiwanitkit V. Forgotten Problems in Land Border Crossings. Ann. Trop Med. Public Health. 2016;9:130. doi: 10.4103/1755-6783.177387.
21. Von Elm E., Altman D.G., Egger M., Pocock S.J., Gøtzsche P.C., Vandenbroucke J.P. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies. BMJ. 2007;335:806–808. doi: 10.1136/bmj.39335.541782.AD.
22. WHO_HSE_IHR_LYO_2009.9_eng.Pdf. [(accessed on 1 February 2022)]. Available online: http://apps.who.int/iris/bitstream/10665/70839/1/WHO_HSE_IHR_LYO_2009.9_eng.pdf
23. Jernigan D.B. Update: Public Health Response to the Coronavirus Disease 2019 Outbreak—United States, February 24, 2020. MMWR Morb. Mortal. Wkly. Rep. 2020;69:216–219. doi: 10.15585/mmwr.mm6908e1

Cite this article as Abokresha, S. et al. Awareness of Staff Working in Quarantine Departments at Egyptian Airports About Implementation of Infection Prevention and Control Measures. *Egyptian Journal of Community Medicine*, 2025;43(4):247-255.

DOI: 10.21608/ejcm.2025.333323.1341